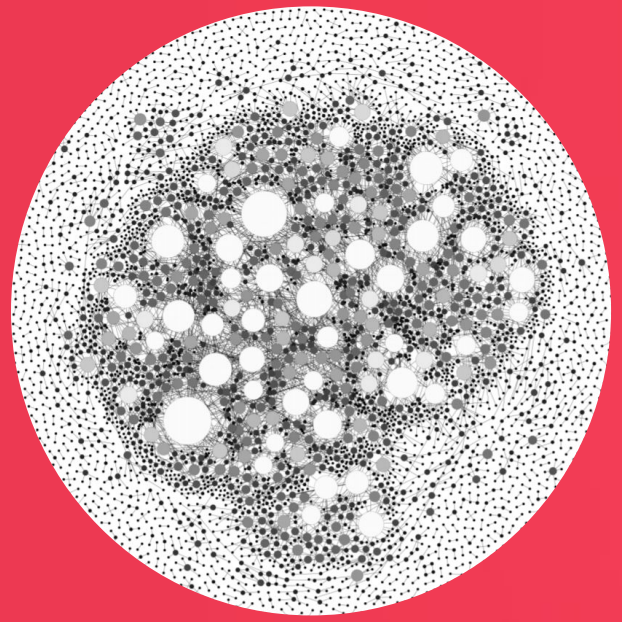


Vienna
26-28th October
2023

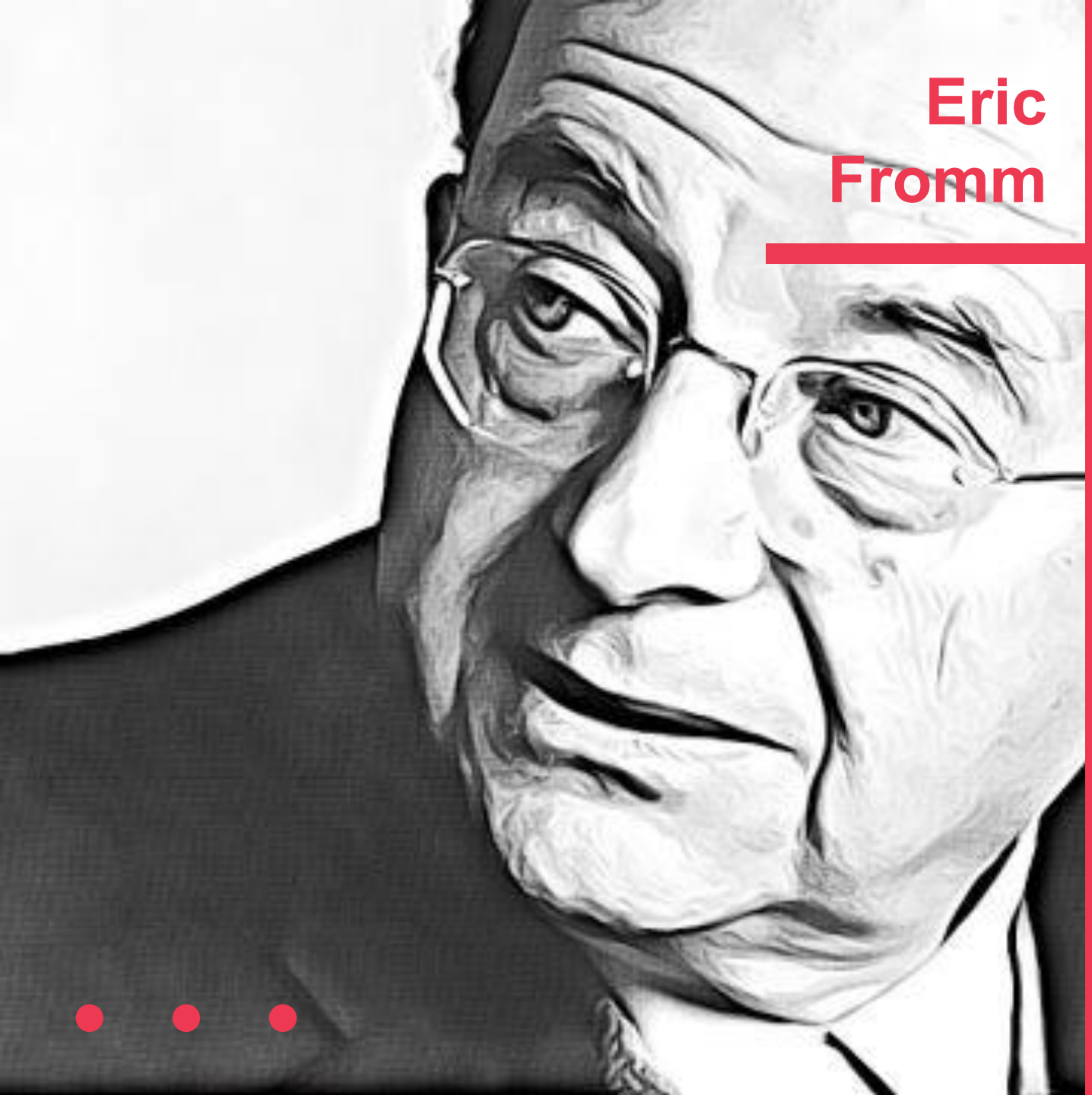
Utopia(s) Reloaded
Science, activism and the techno-eco-social transformation

Designing Interaction from the local to the global level

The role of interactive technologies in the deployment of adaptive constellations of social utopias

José María Díaz Nafría (Madrid Open University, Spain | GSIS | IS4SI)
Teresa Guarda (Santa Elena Península University, Ecuador | GSIS | IS4SI)
Modestos Stavrakis (University of the Aegean, Greece | BITrum)

GSIS
The Institute for a Global Sustainable Information Society



Eric Fromm

“A specter is stalking in our midst [...]. It is not the old ghost of communism or fascism. [...] Brezezinski put it, «In the technetronic society the trend would seem to be towards the aggregation of the individual support of millions of uncoordinated citizens, easily within the reach of magnetic and attractive personalities effectively exploiting the latest communication techniques to manipulate emotions and control reason»”

(*The Revolution of Hope*, 1968)

Ortega y Gasset

"**I am I and my circumstance;**

and, if I do not save it, I do not

save myself."

(*Meditations on Quixote,* 1914)

Agenda
Table of contents

I. The way out of the anthropocene

II. Tools to understand how to dealt with complexity

III. How is our ICT’s interaction sphere

IV. Interaction in nature, throughout history, in collaboration

V. Designing sustainable interaction: Cyber-subsidiarity (theory & practice)

The way out of the anthropocene

1) From pre-cambric to anthropocene
2) Symbiocene
3) How we got stucked?

The way out of anthropocene?
From pre-cambric to holocene

(MediaWiki)

- **Precambric**: the different structures that enabled the development of life as we know it emerged.
- Prokaryote and eukaryote as basis for the multiplication of species in the *phanerozoic*.

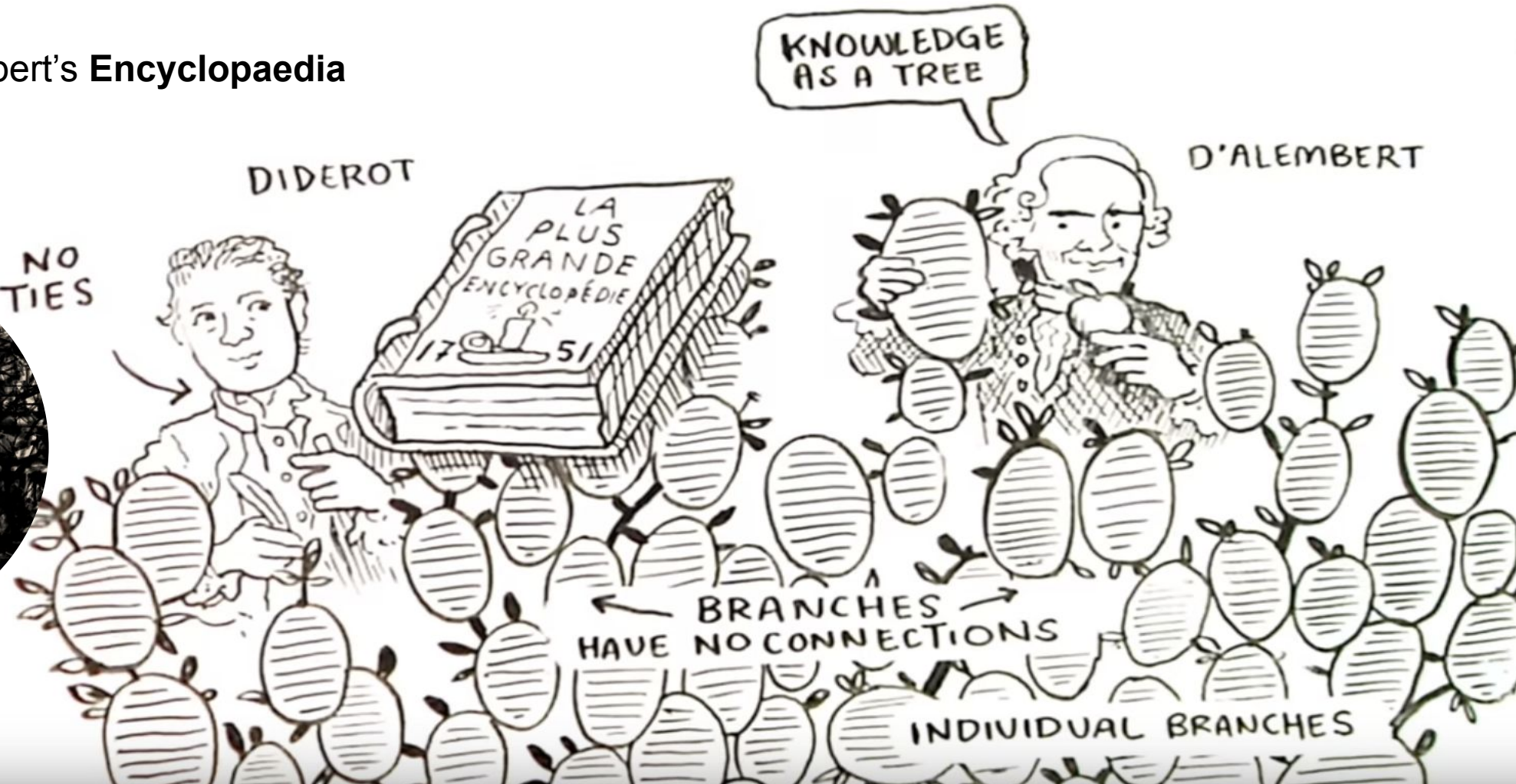
The way out of anthropocene? to Symbiocene?

- The human footprint in the geological register is remarkable: existence of species, climatic change, materials…
- What can follow the Anthropocene? The *Symbiocene*?

How we have dealt with complexity?

Conflicting tendencies of modernity: **analysis** vs **synthesis**

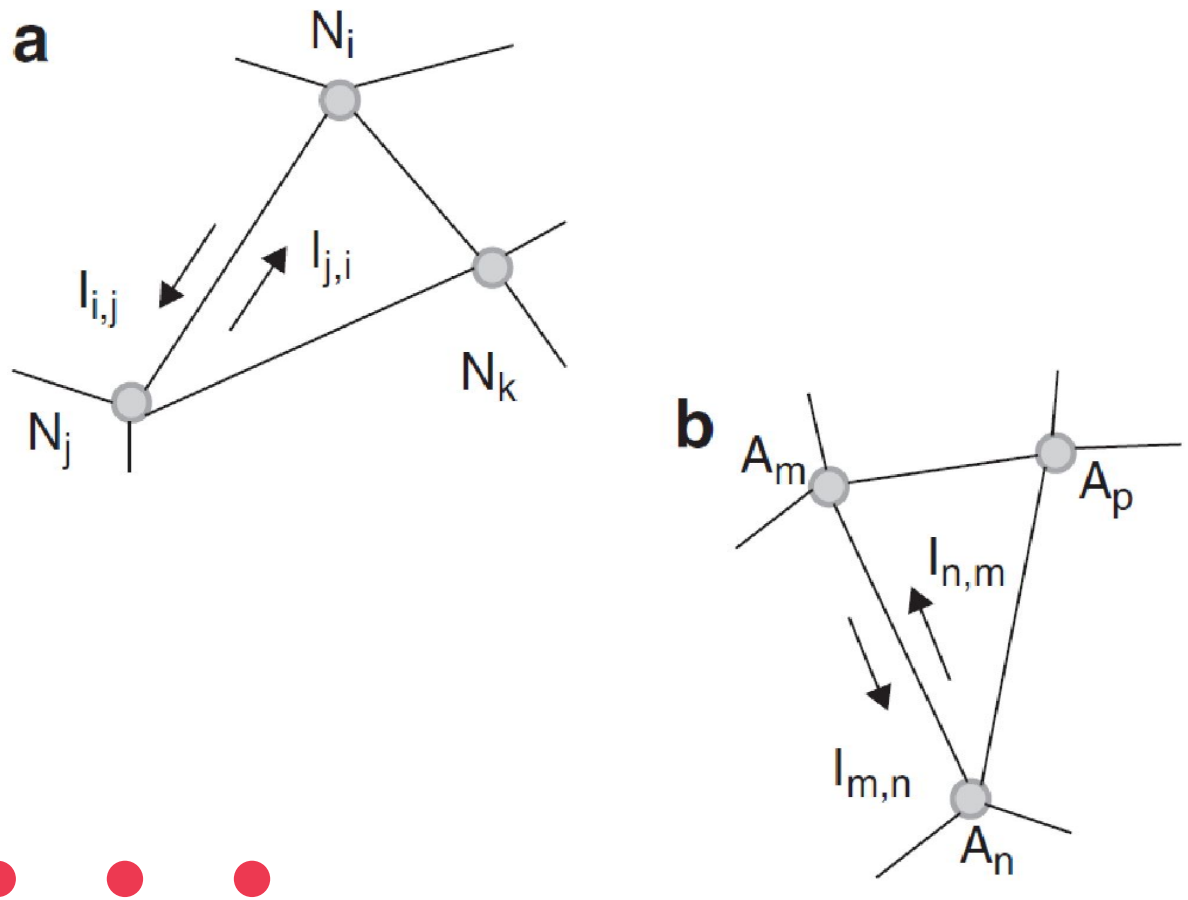
Diderot & D'Alambert's **Encyclopaedia**
(XVIII C.)



Tools to understand how to deal with complexity

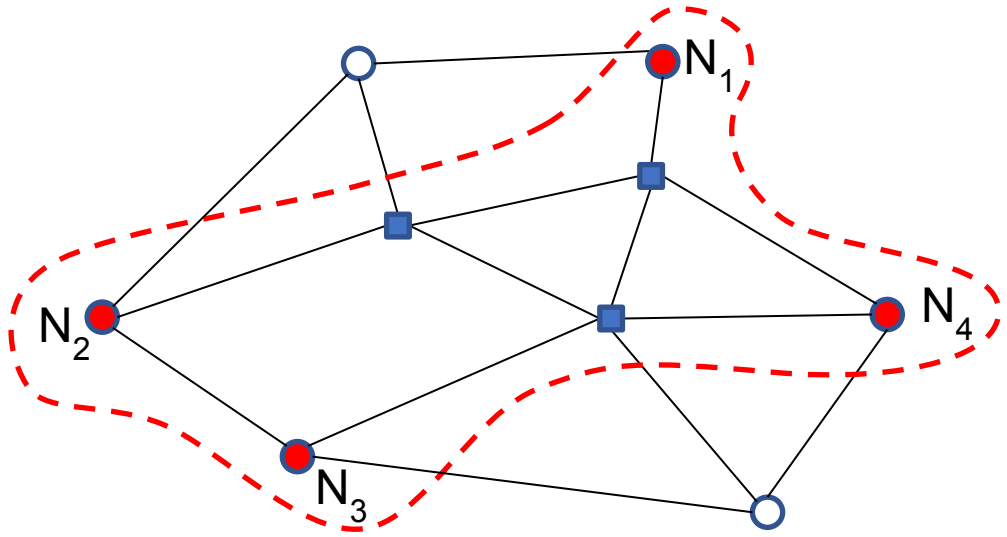
1) Networks, information, agents
2) Active and passive networks
3) Network vs system
4) Subsidiary information model: levels of complexity
5) Multilevel networks and systems

Network, information and agent



- The network provides a successful link to all complex reality no matter its nature.
- When we map reality, **information** equates INTERACTION between (generalised) agents, then we can map real interaction of any nature (physical, biological, human, technical)

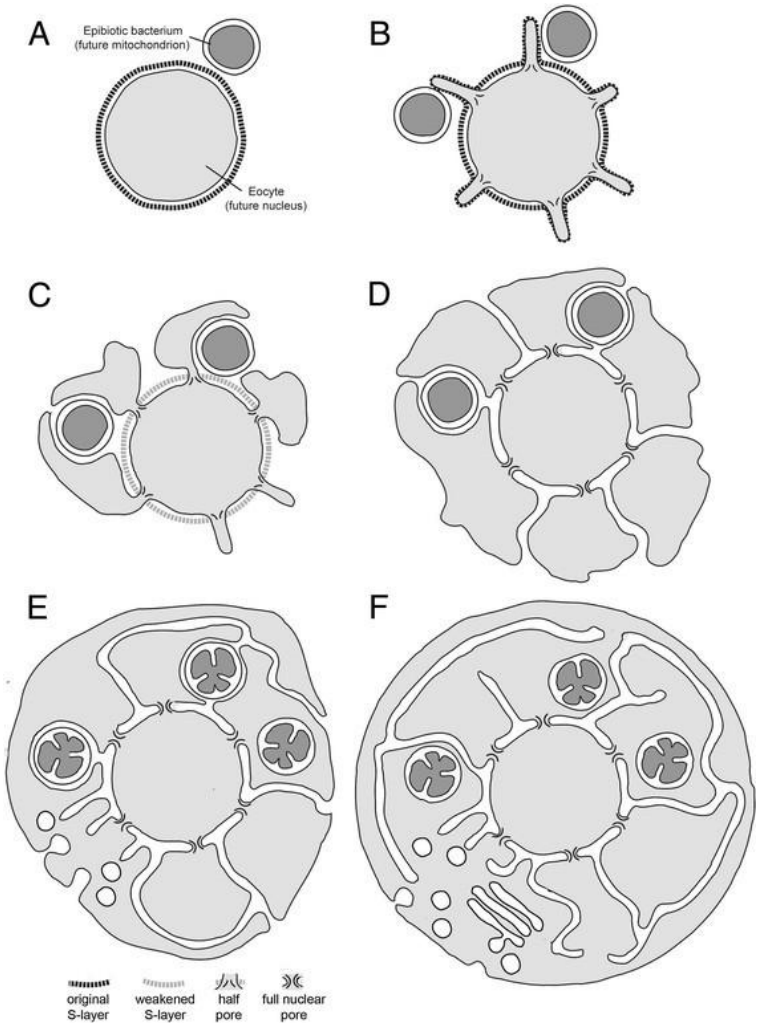
Active and passive networks



- It depends on the type of node: Does it act or not by itselfs? Active / passive
- Active node: **autonomous agent**
- What is it? System capable to perform thermodynamic cycles to provide its existential needs

Network vs System

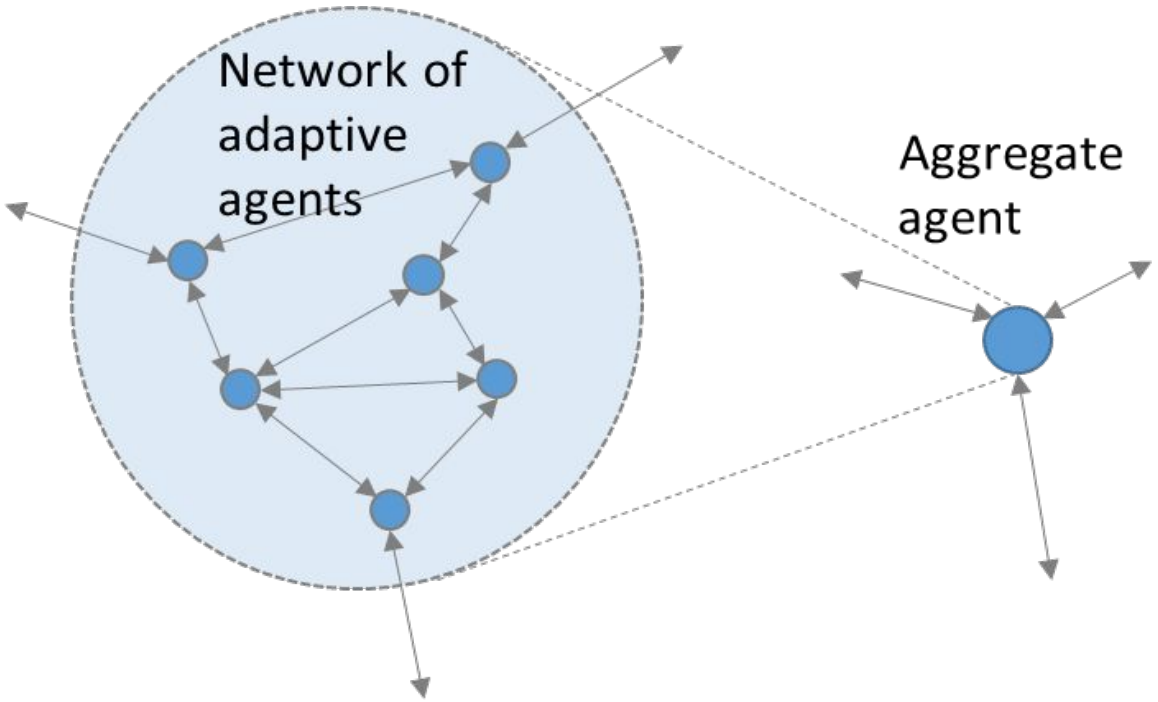
Origin of eukaryote cell



- An **stable boundary** offers a difference in the regulation capacity.
- It will be a sustainable system or autonomous agent if it is able to survive in its environment.

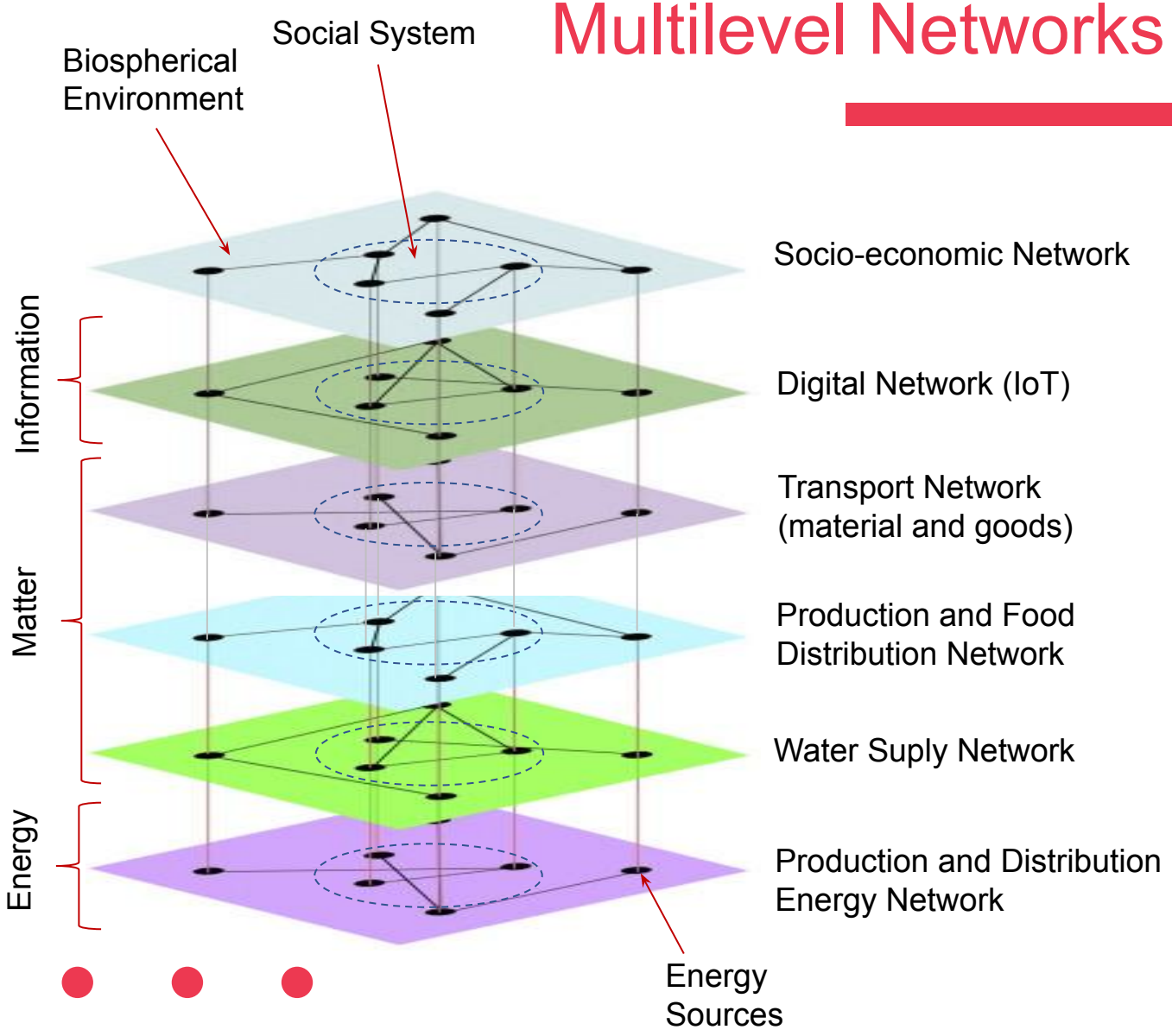
Subsidiary Information Model

Addressing the dynamics of complex systems as **networks of adaptive agents interacting** with other agents and the environment.



- The information exchanged among the parts of the autonomous agent (efficiently networked) and with the environment perform successful cycles to **preserve the adaptive identity of the system and its capacity to act autonomously** [Kauffman 2000].
- The inner information exchange can be abstracted as the grounding for the agent's identity and capacities.

How to map further reality?
Multilevel Networks

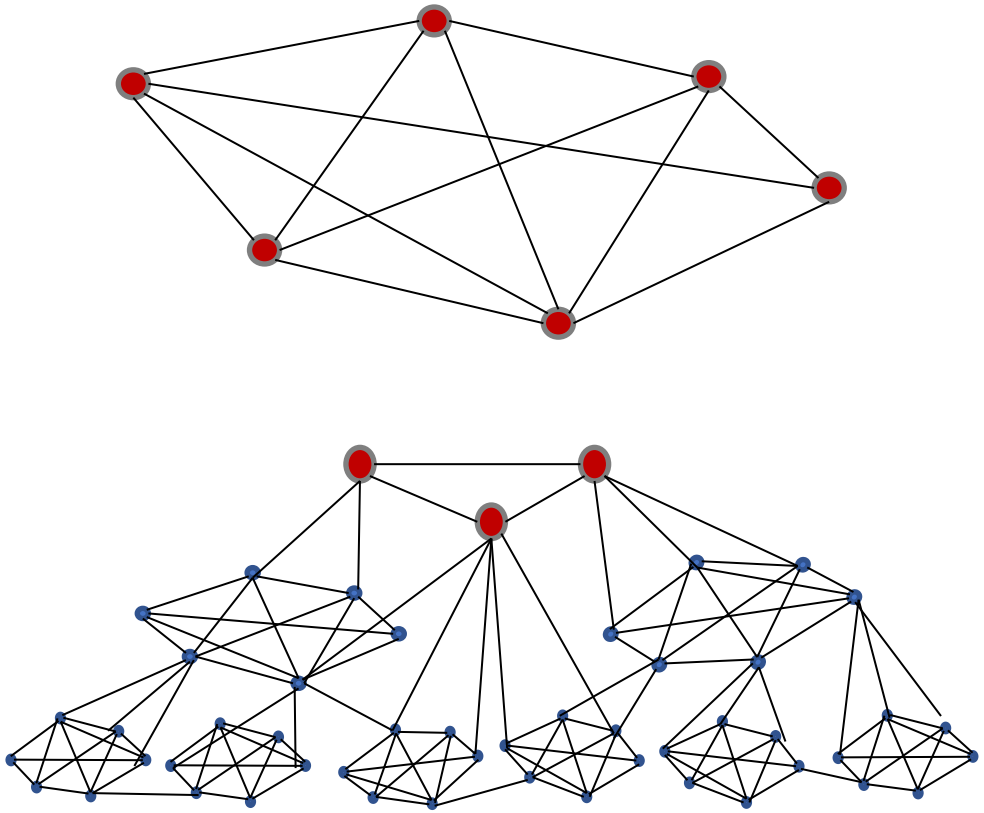


- At each level we can distinguish inside and outside defined by frontiers. The inner side is the **system**.
- If a **system** has capacity of autonomous agency we can abstract it as a node of a wider network.

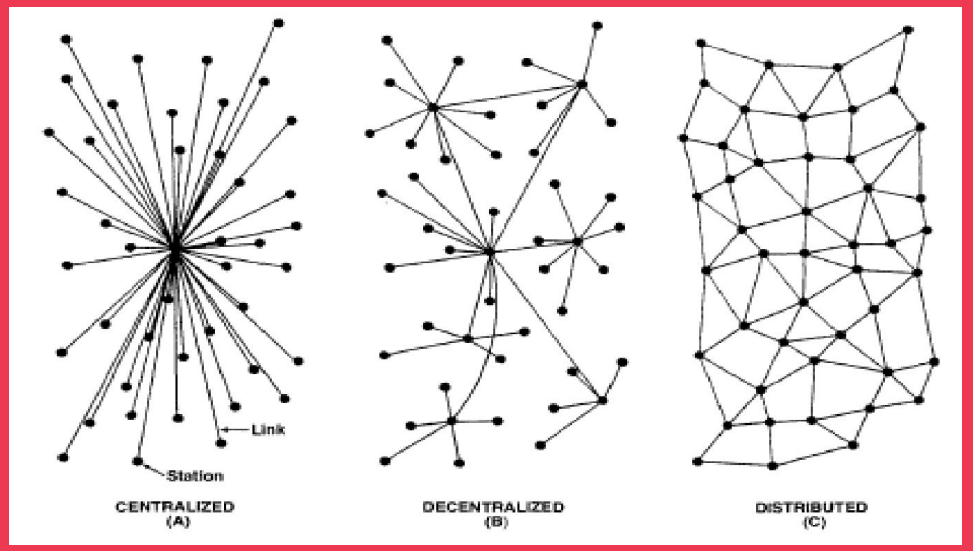
How is our ICT's interaction sphere?

1) Imagined, planned, achieved
2) Connected and disconnected
3) Global brain?
4) Concentration (passive and active networks)
5) Global North, Global South
6) Interaction under surveillance capitalism

How is the real structure of our technical information sphere?



- ¿Is it an **horizontal** structure (as originally intended by Baran)
- **Barabasi** found out it is free scale network (smallworld)

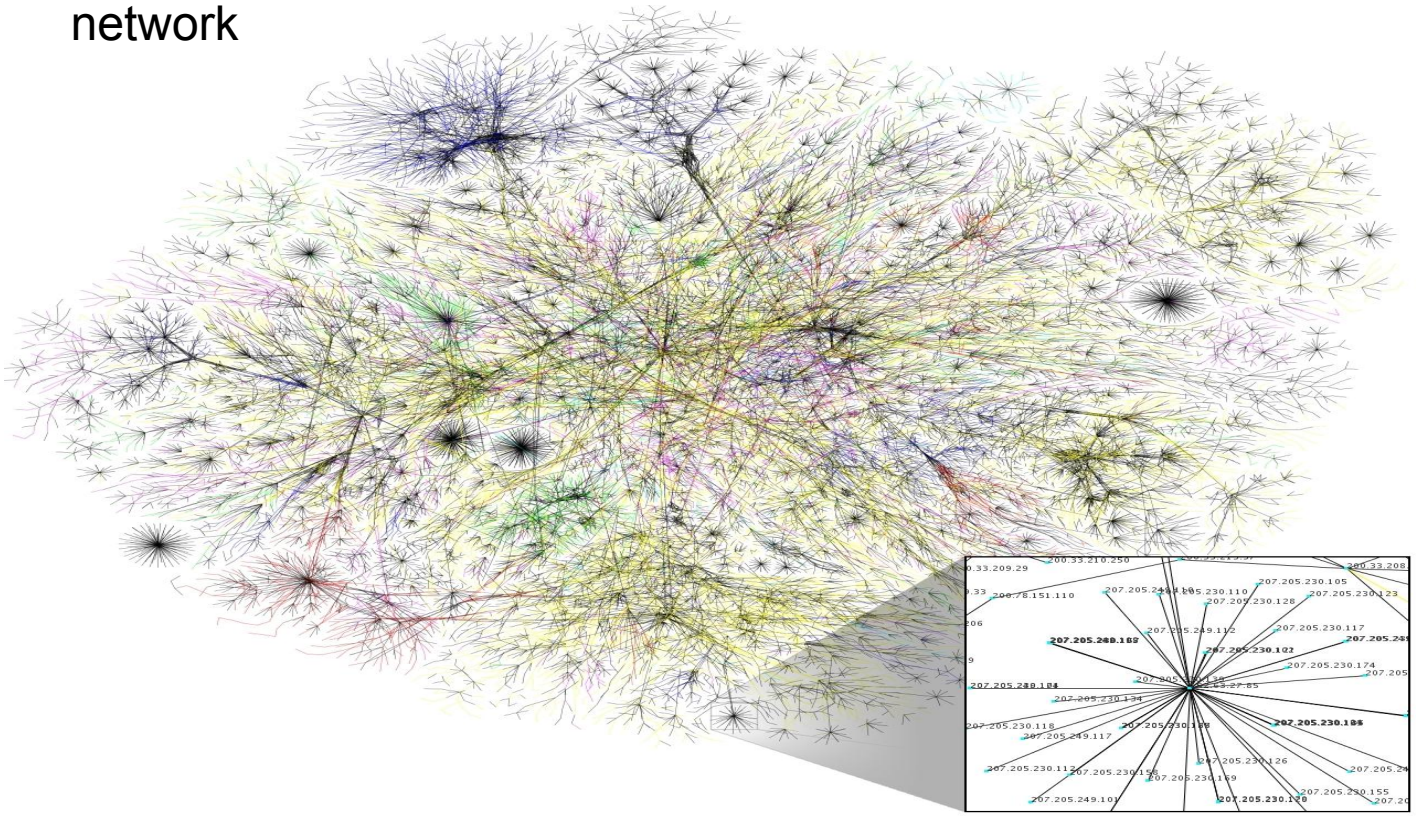


How is the real structure of the information sphere?

- Despite the lyric and advances in connectivity there are many people with no Access to internet whatsoever.
- The capacity and quality is very unequaly distributed.

How is the real structure of the information sphere?

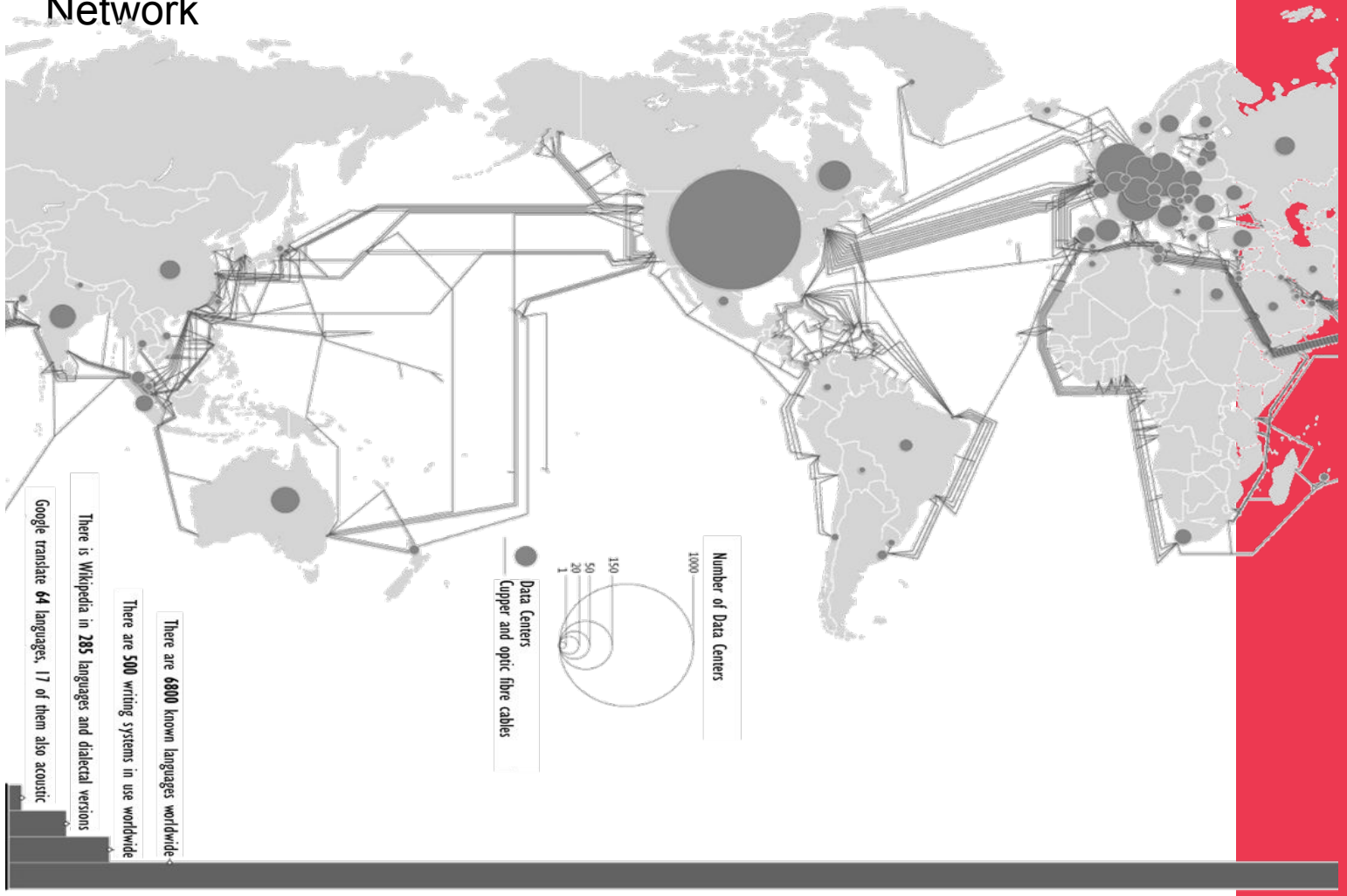
Passive
network



- It responds to the characteristics discovered by Barabasi.
- Some nodes are more connected than others, providing in general small distance and sufficiently high resilience.

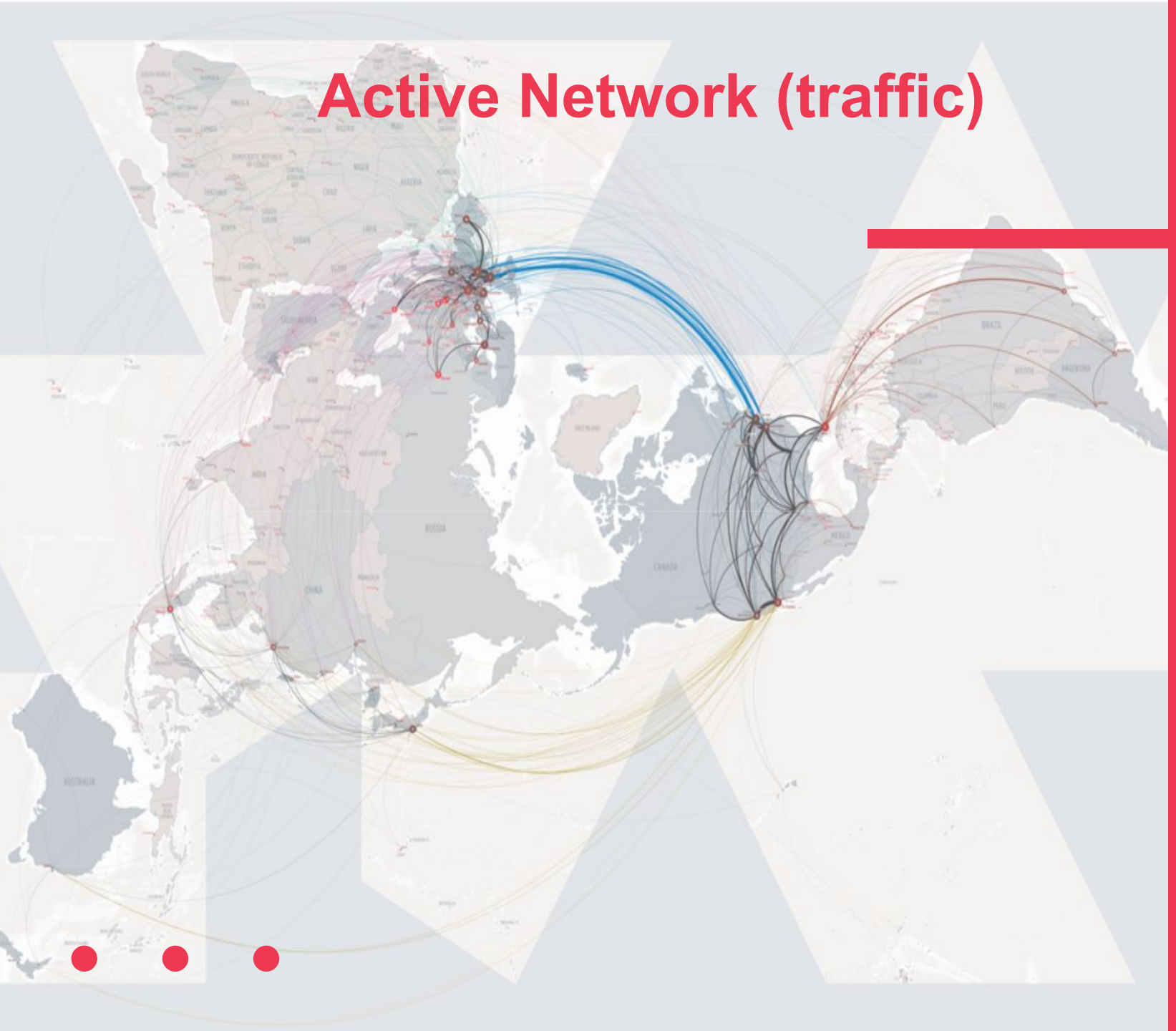
How is the real structure of the information sphere?

Passive
Network



- **Telecommunication Infrastructure** sufficiently distributed
- **Bigdata Centers** very concentrated.
- The actual **connections** tend to the nodes near to the bigdata centers.

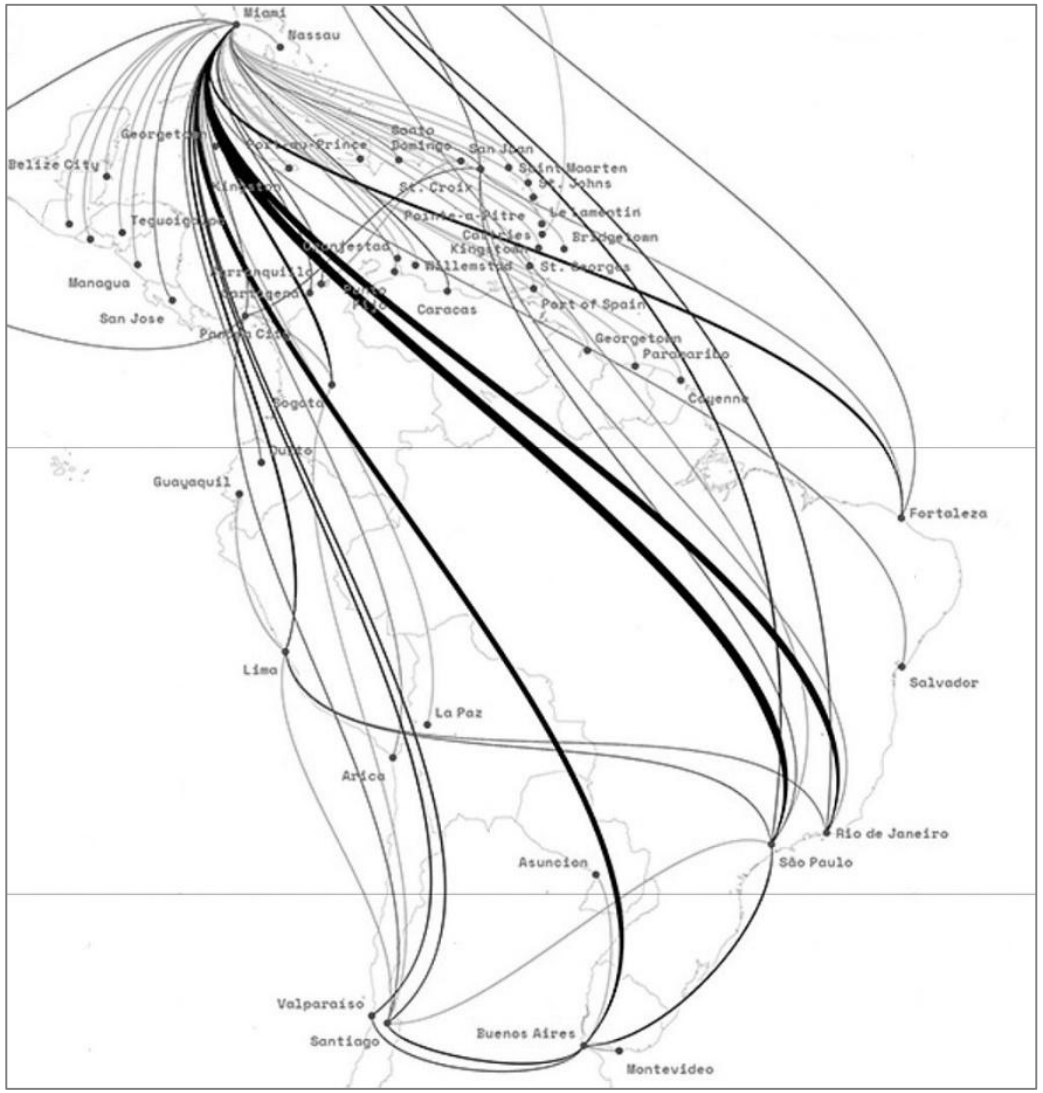
Active Network (traffic)



- Few nodes are hyper-connected
- Periphery with star-like connection
- Latin America and Africa without own network

South America and Africa

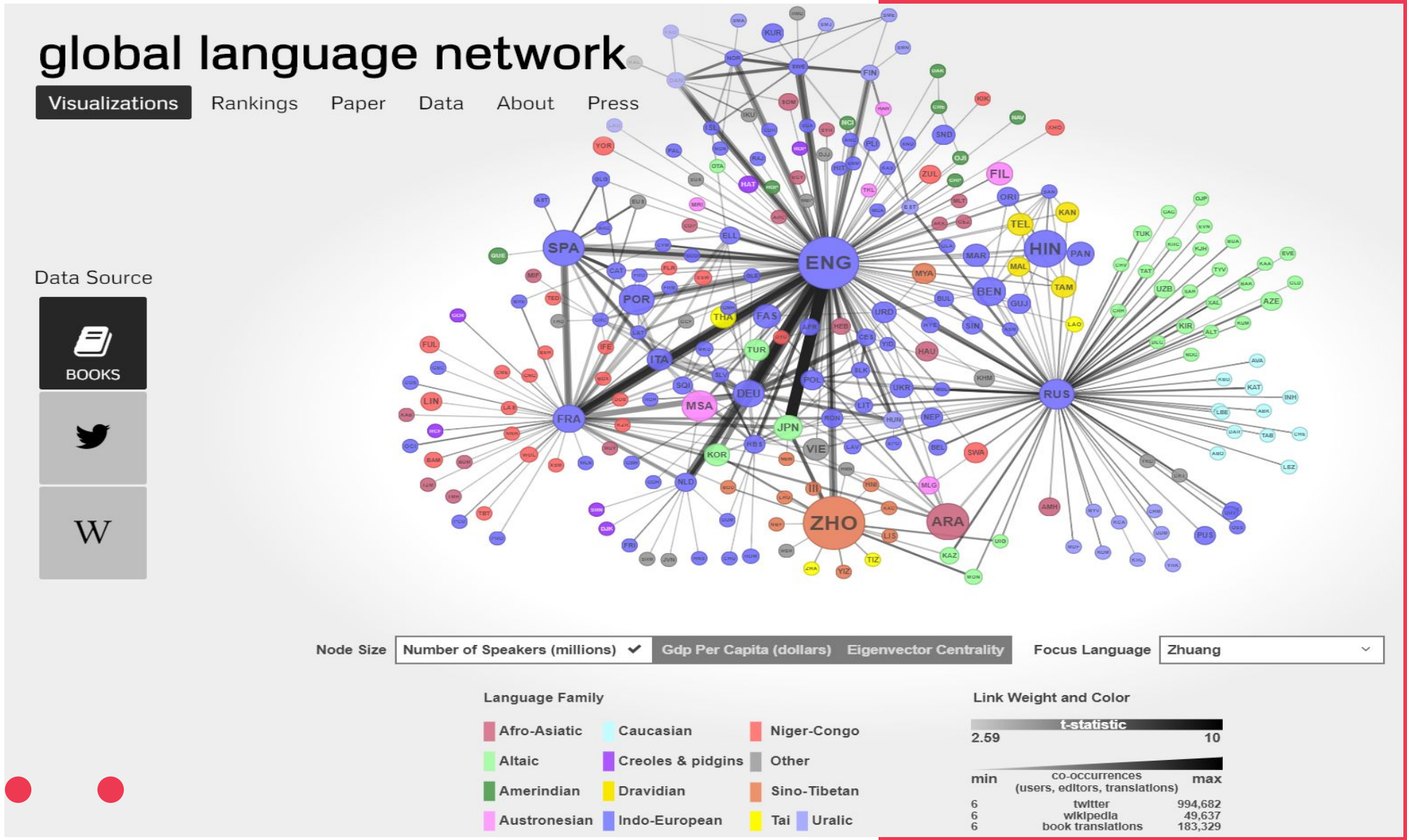
Star-like Networks with centers outside the region



Network-kern (North)

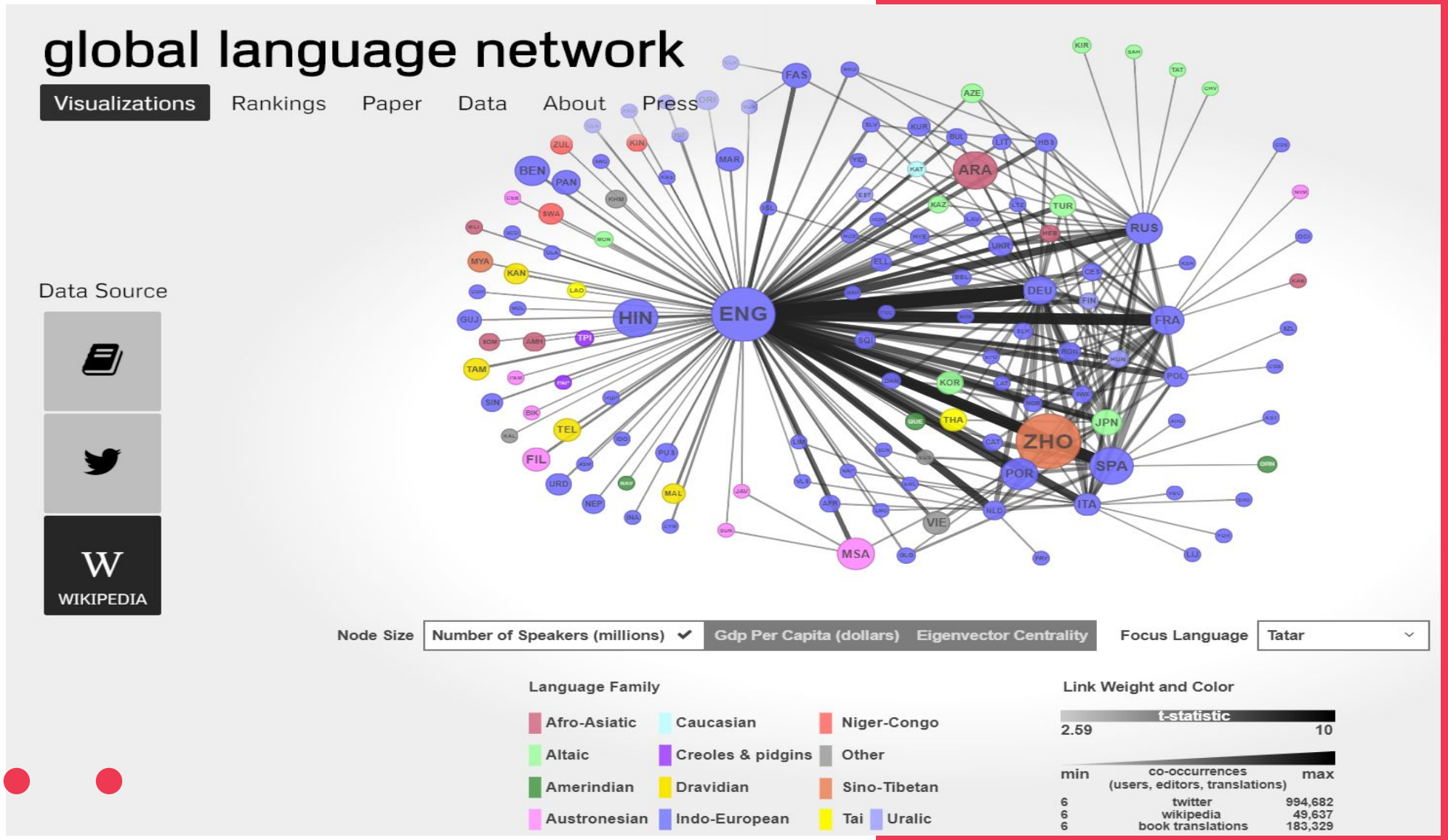
Linguistic network (pre-internet)

Books and translations

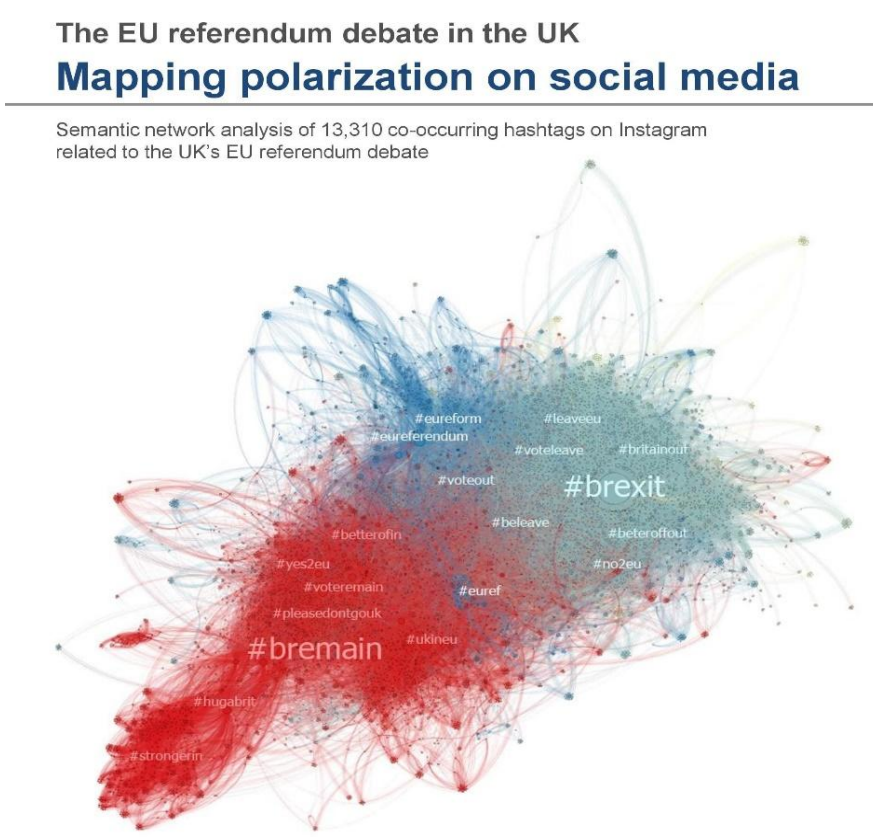


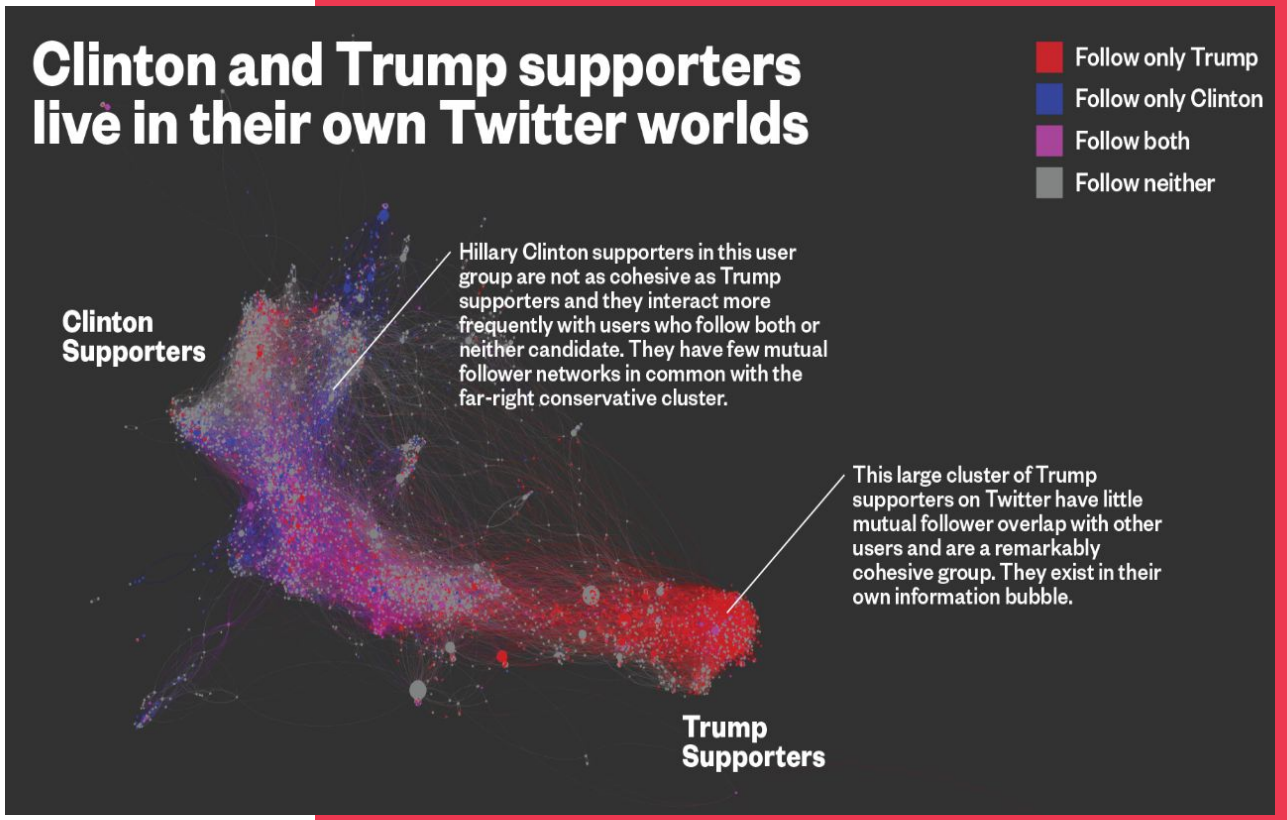
Linguistic network (internet)

Contributions to Wikipedia from languages and authors of other languages

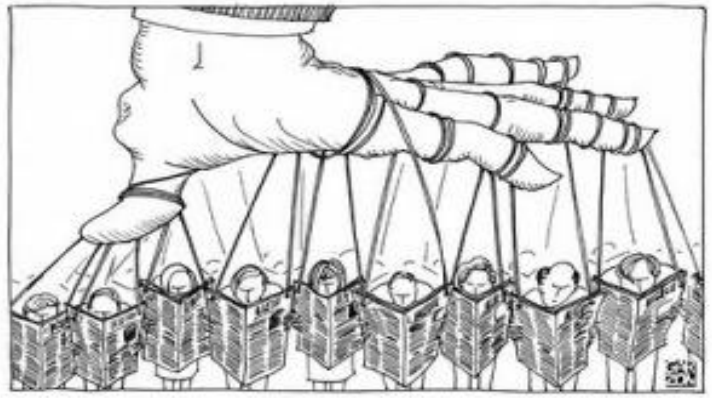


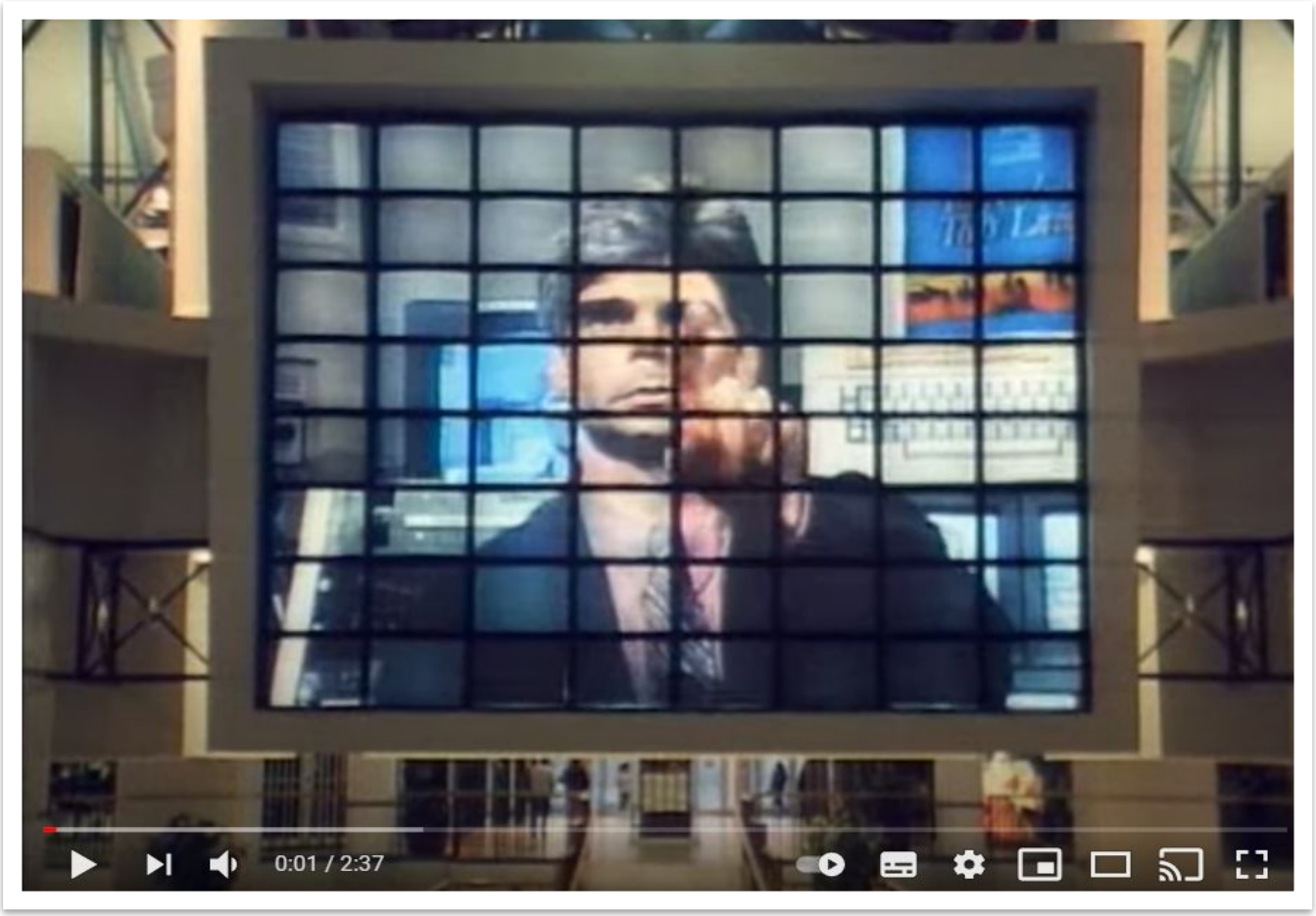
The age of surveillance capitalism





From the spectator democracy to capitalism surveillance





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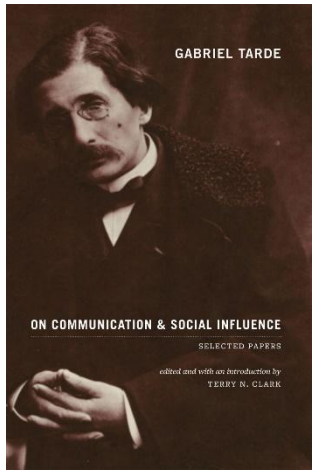
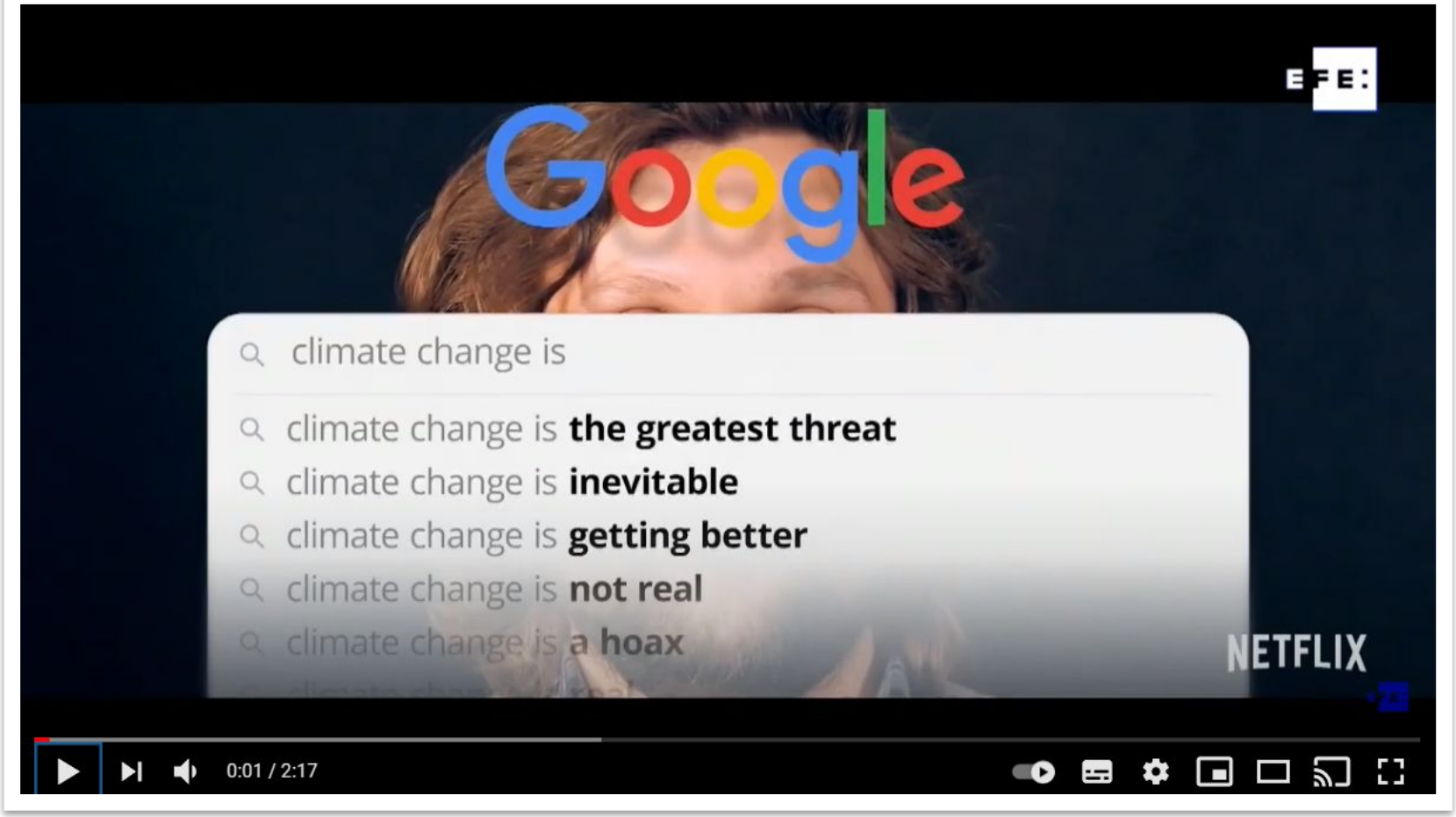
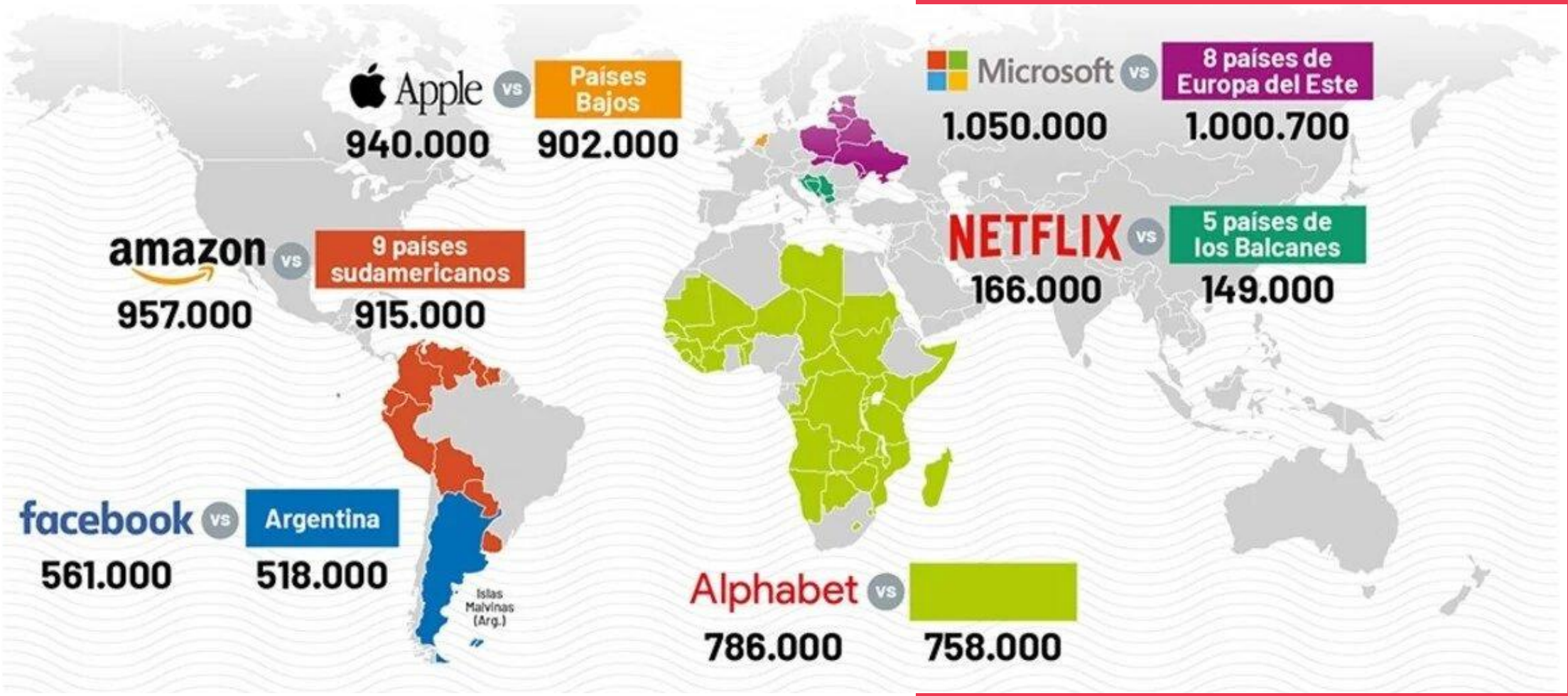




Surveillance Capitalism

Forces correlation

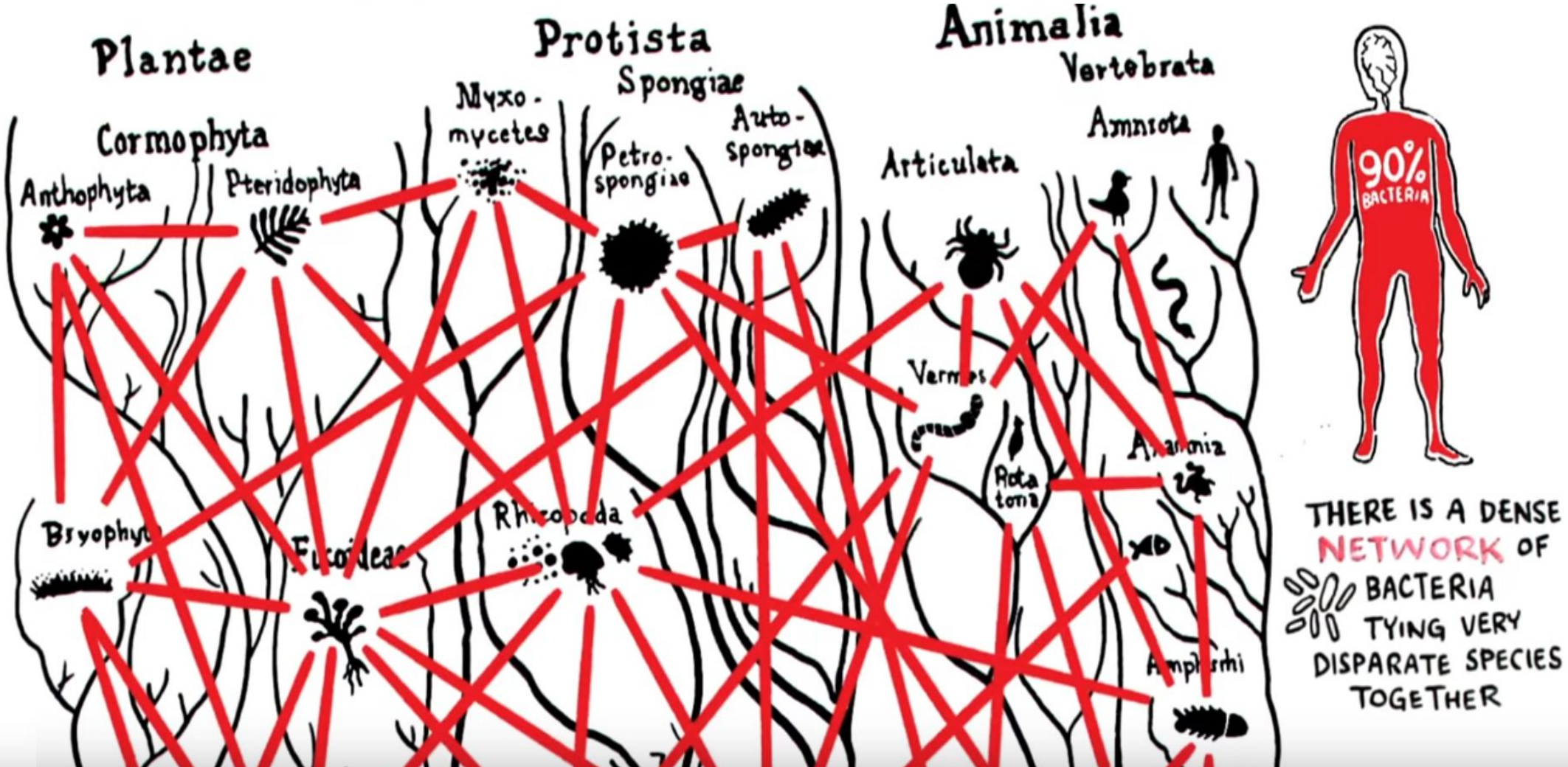
Comparison: bursátil capitalisation vs BIP (Million USD)



Interaction in nature, throughout history, in collaboration

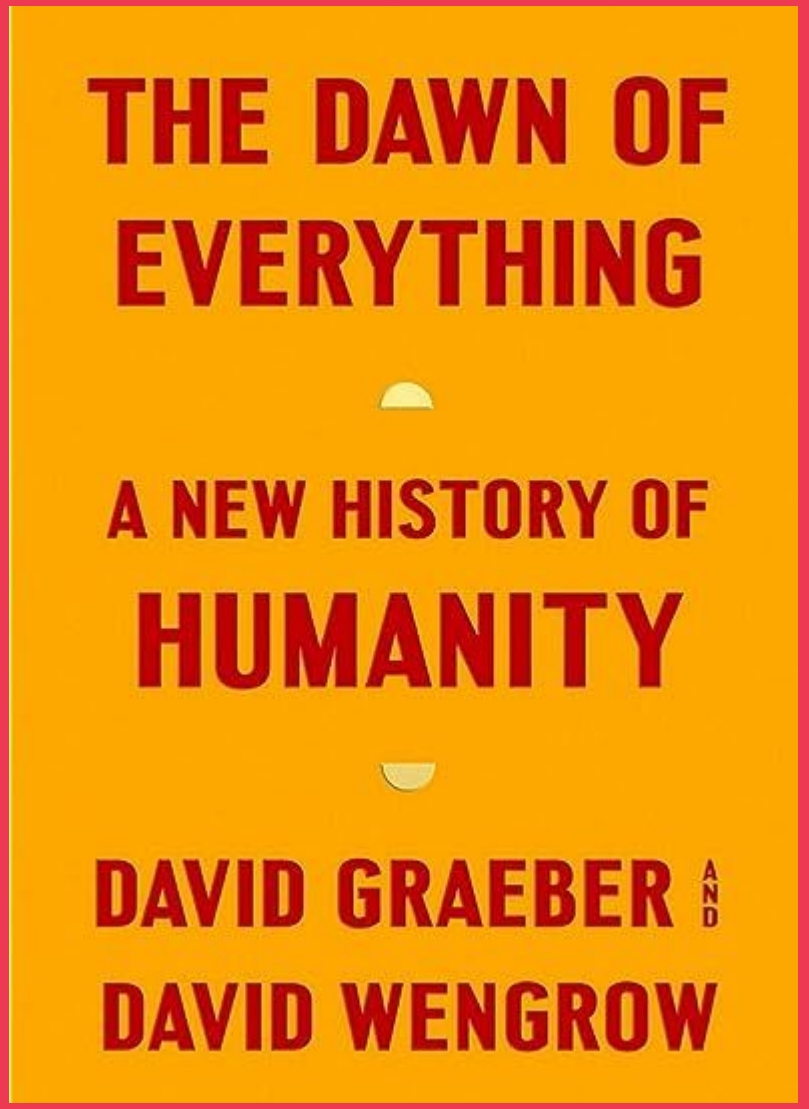
1) Network of life
2) The networks of human interaction (a historical perspective)
3) Networks of knowledge & collaboration

What there is? The Network of Life



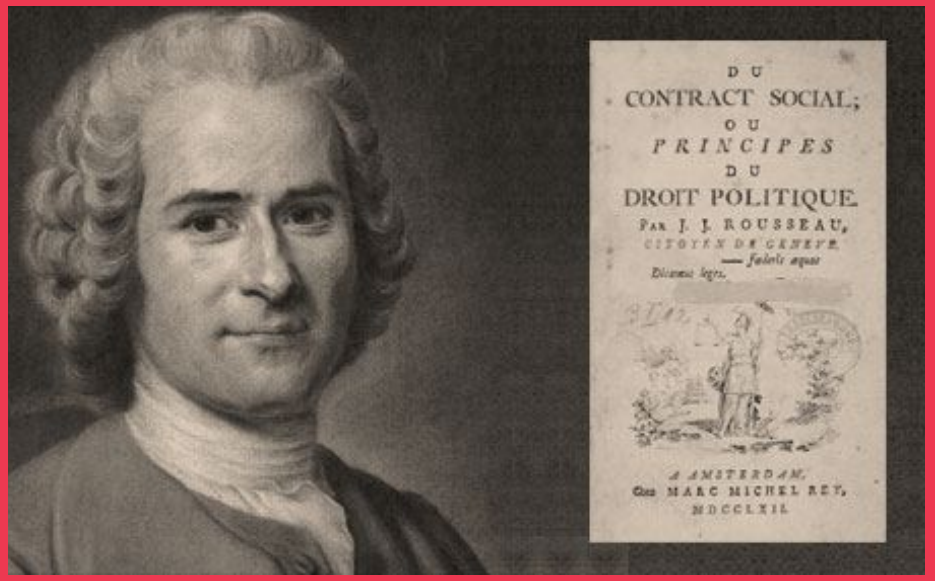
(Lima, 2012: *The Power of Networks*)

Beyond determinism: diversity of living forms, intentional futures



Graeber (*anthropologist and activist*) & **Wengrow** (*archaeologist*) (2021).

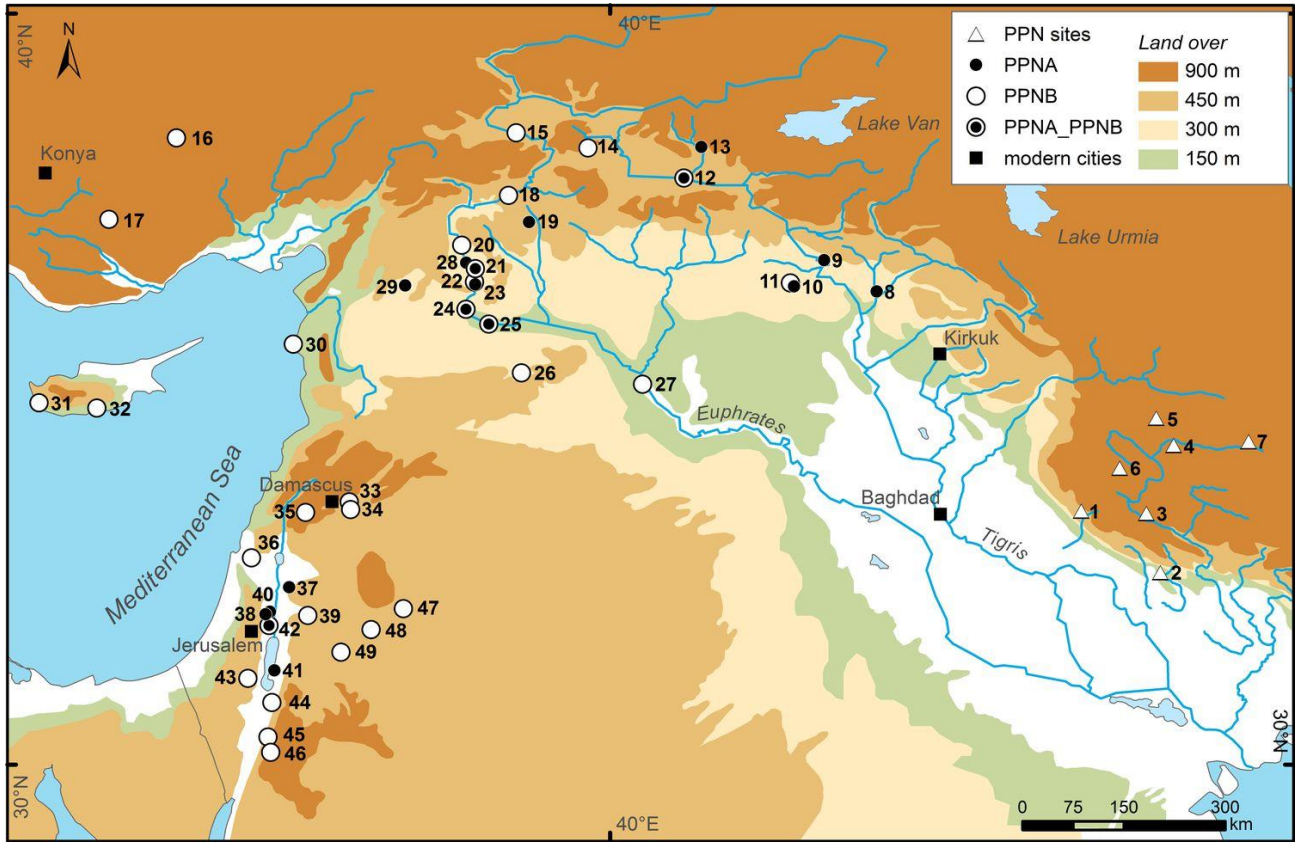
Human history and political theory:
Between Leviathan and the noble savage



The prehistoric origin of the city

- Elias **Canetti** (Mass and Power): Cities start in the mind of ancient hunter-gatherers, thinking in much larger collectives that those to which they were living.
- A group above 2000 people starts to be abstract: symbolic relations.

The prehistoric origin of civilisation



- Coincidence of the development of agriculture in hunter-gatherer societies.
- Experimentation and transcendency of living conditions.
- The fundamental role of women in the technical and scientific development (fabrics, mathematics, calendars, medicine, domesticating plants, etc)

The prehistoric origin of civilisation

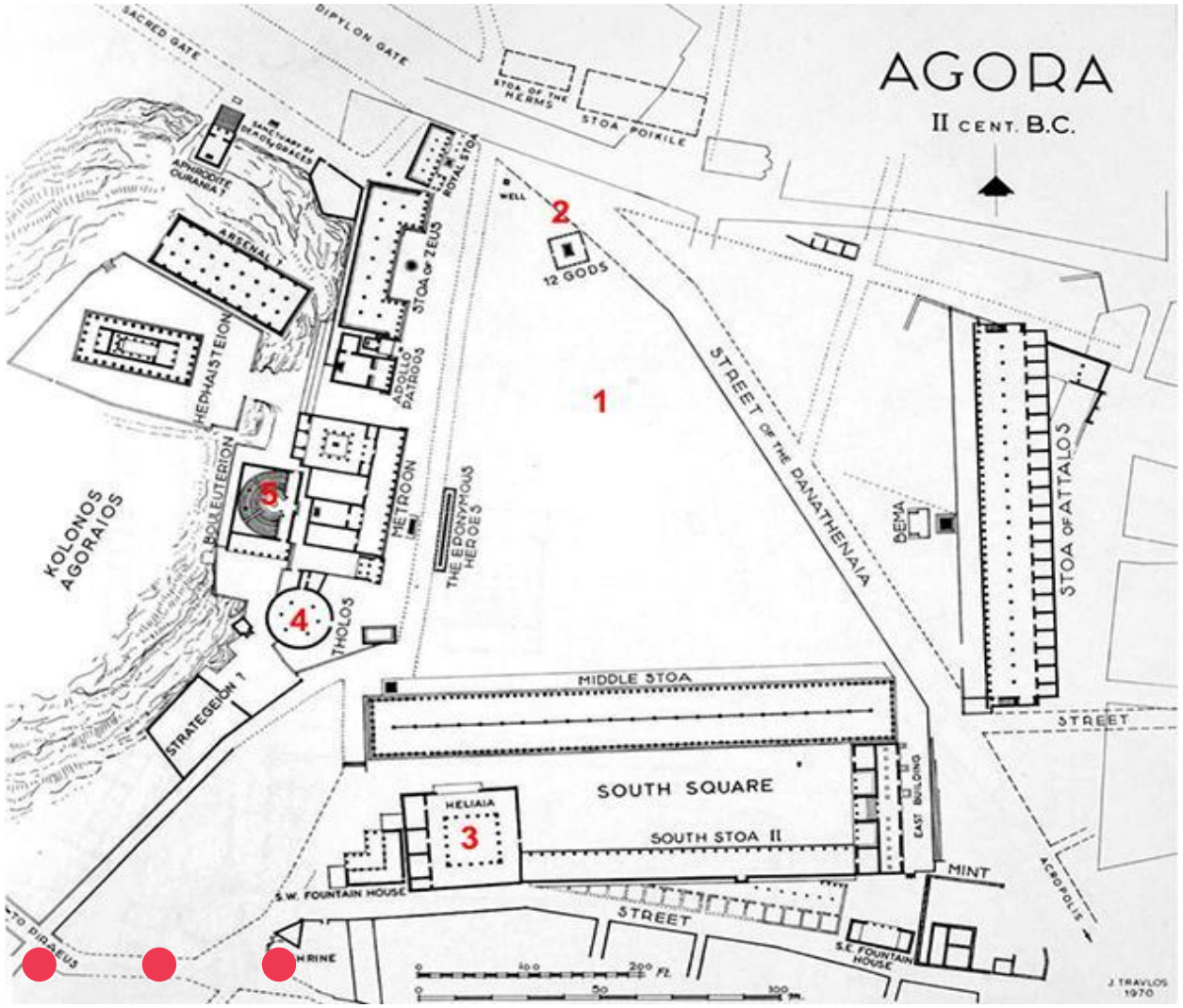
- Göbekli Tepe (ca. 9000 BCE)

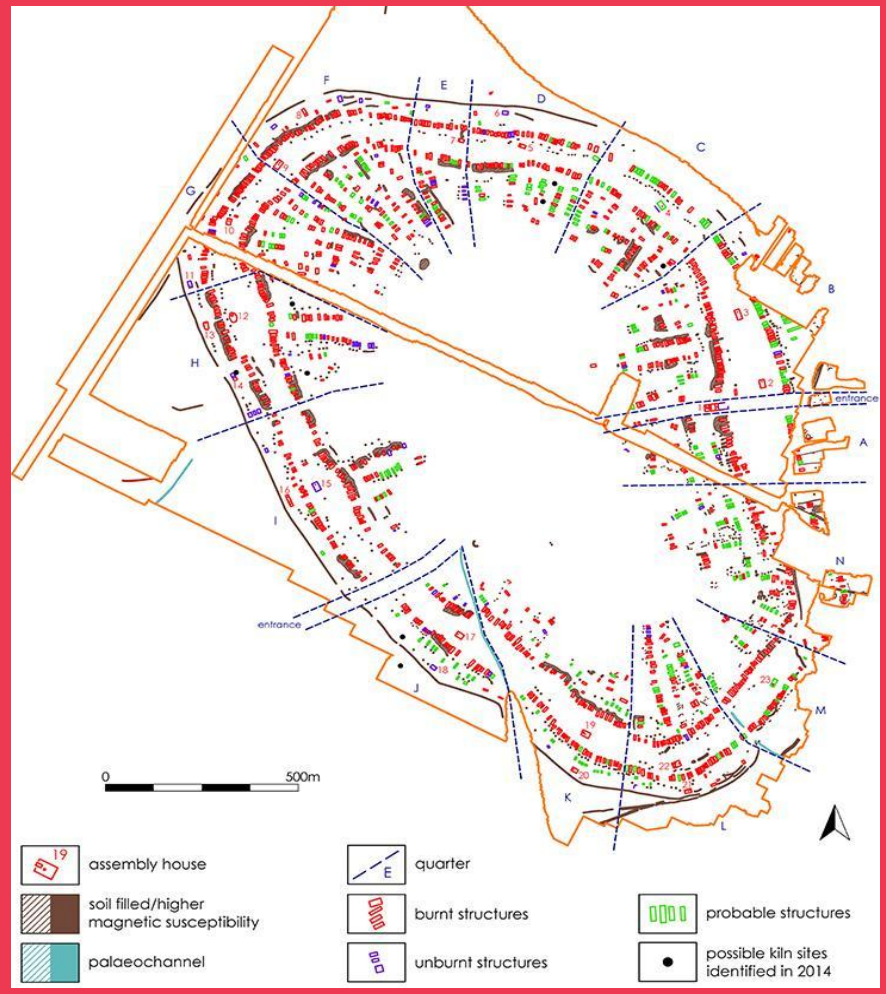
Politics before the states

- Mega-sites in the ukrainian steppes
- Mesopotamic Cities
- Teotihuacan

Starting democracy

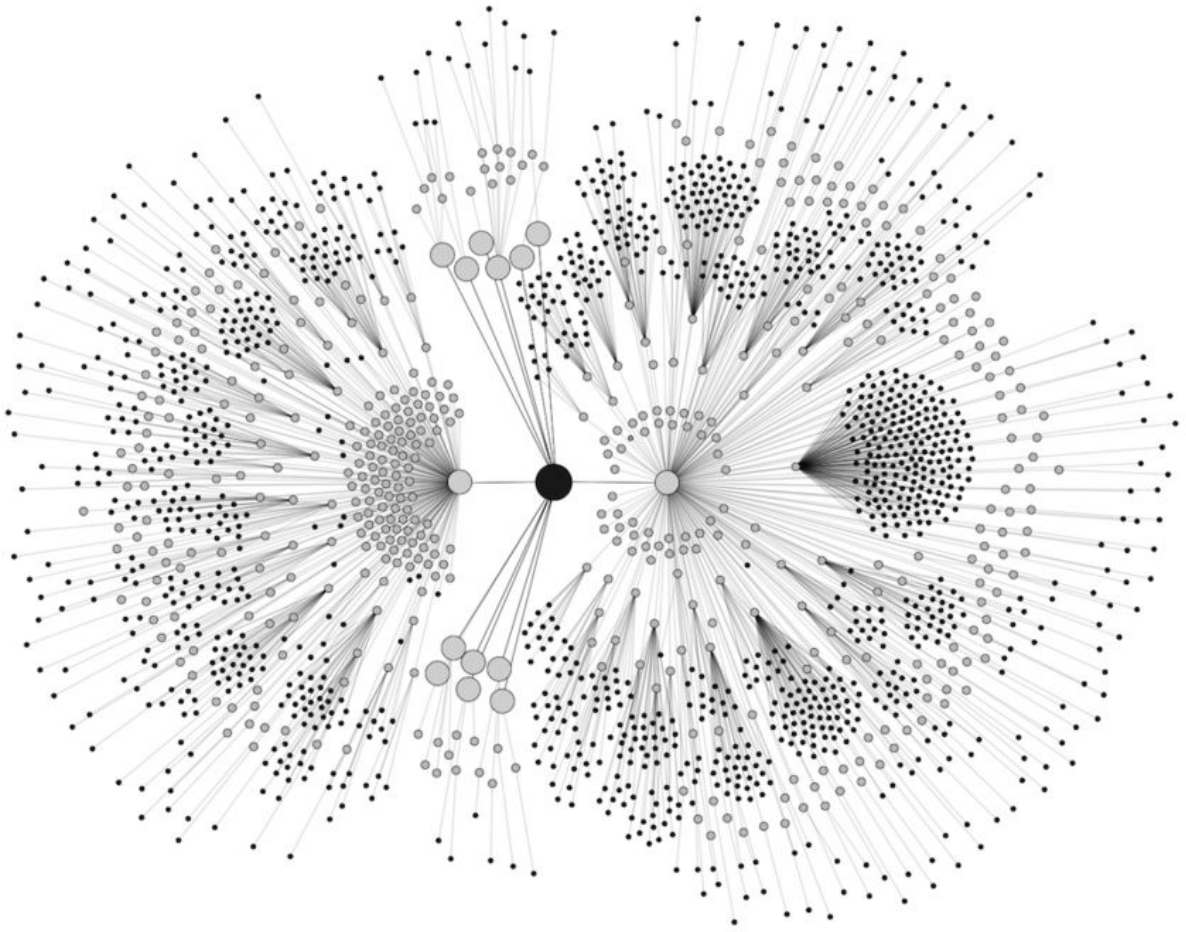
- The greek agora: What democracy?
- The ukrainian megasites (4.100-3.300 BCE) Nebelivka





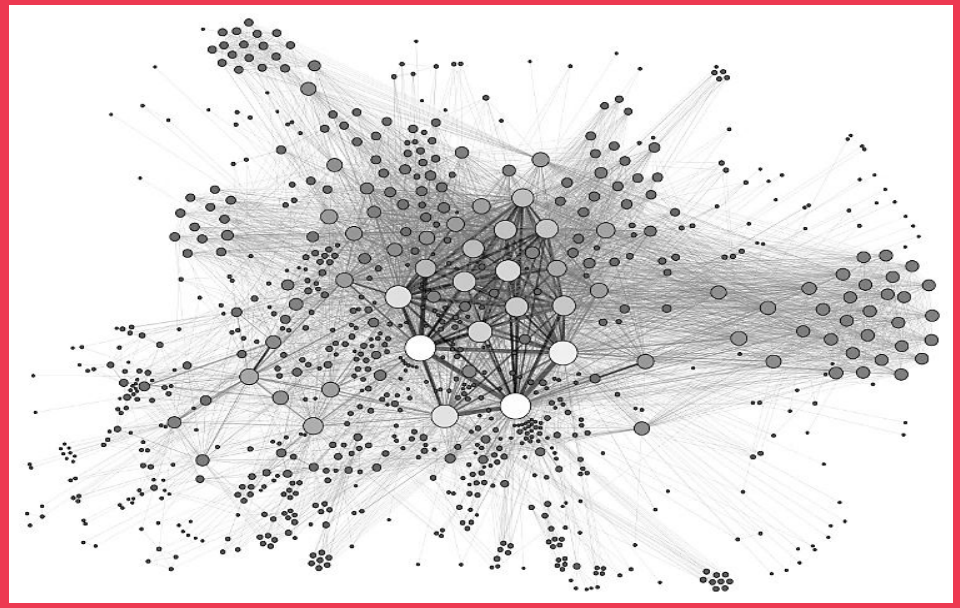
From trees to networks

Positivism vs Systematic viewpoint

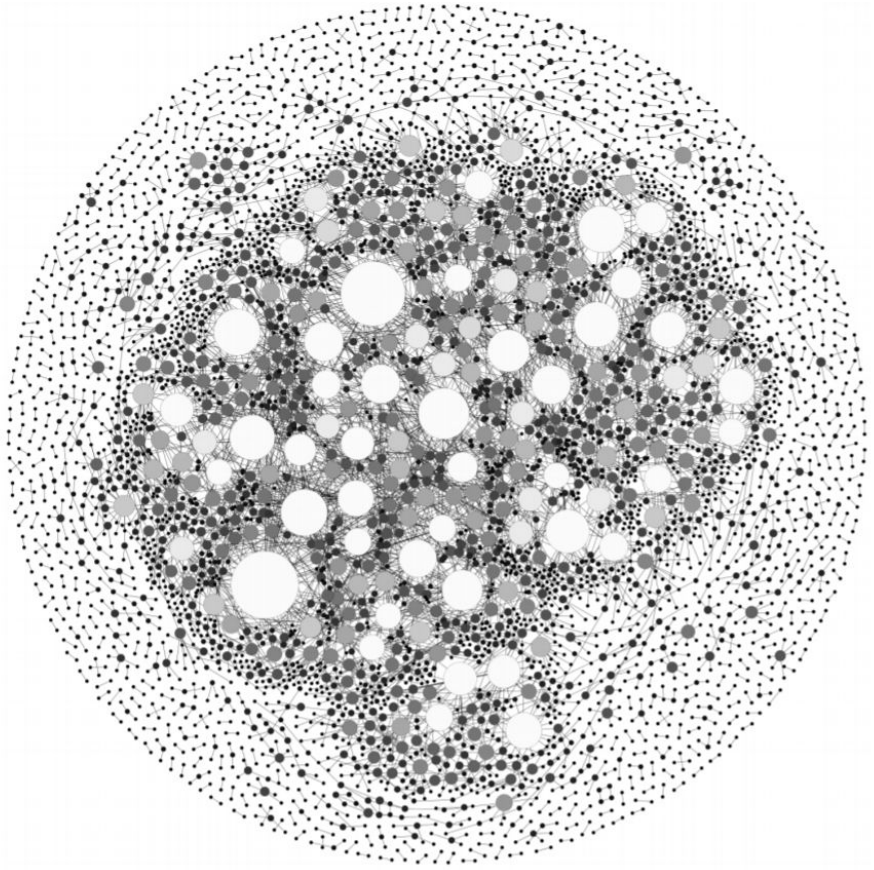


(Grandjean, 2014: *La connaissance est un réseau*)

- Universal Decimal Clasification (Otlet and La Fontaine)
- Knowledge Networks (International Commission for Intetelctual Cooperation, 1922-1930)

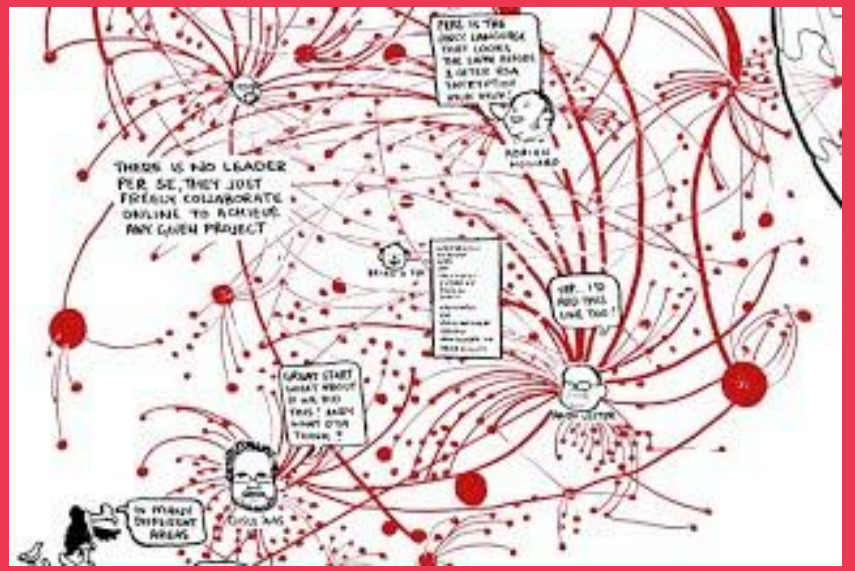


Knowledge and Collaboration Networks



(Grandjean, 2014)

- **Co-occurrence** networks and **co-authorship** networks
- **Collaboration** networks (PERL programming)



(Lima, 2012)

Designing Interaction: Cyber-subsidiarity

1) Subsidiarity
2) Cybersubsidiariy model
3) Two examples of cybersubsidiarity

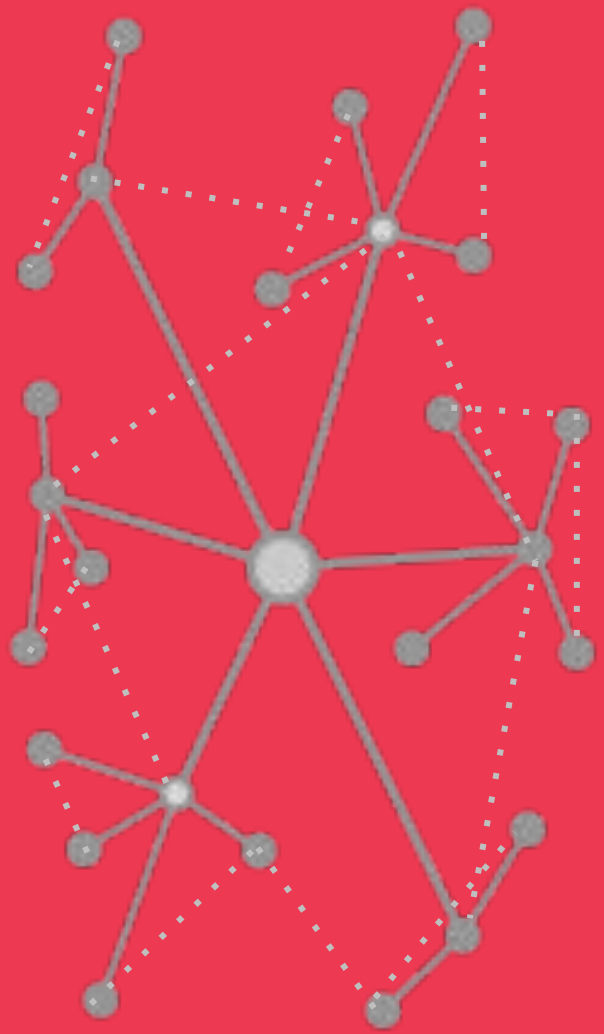
Can we do it differently?
Cyber-subsidiarity

Althusius (1563–1638)

- DÍAZ-NAFRÍA (2017). "Cyber-subsidiarity: towards a global sustainable information society". Springer Link
- HOFKIRCHNER, DIAZ-NAFRÍA et al (2019). "ICTs connecting gloabl citizens…". Springer Link

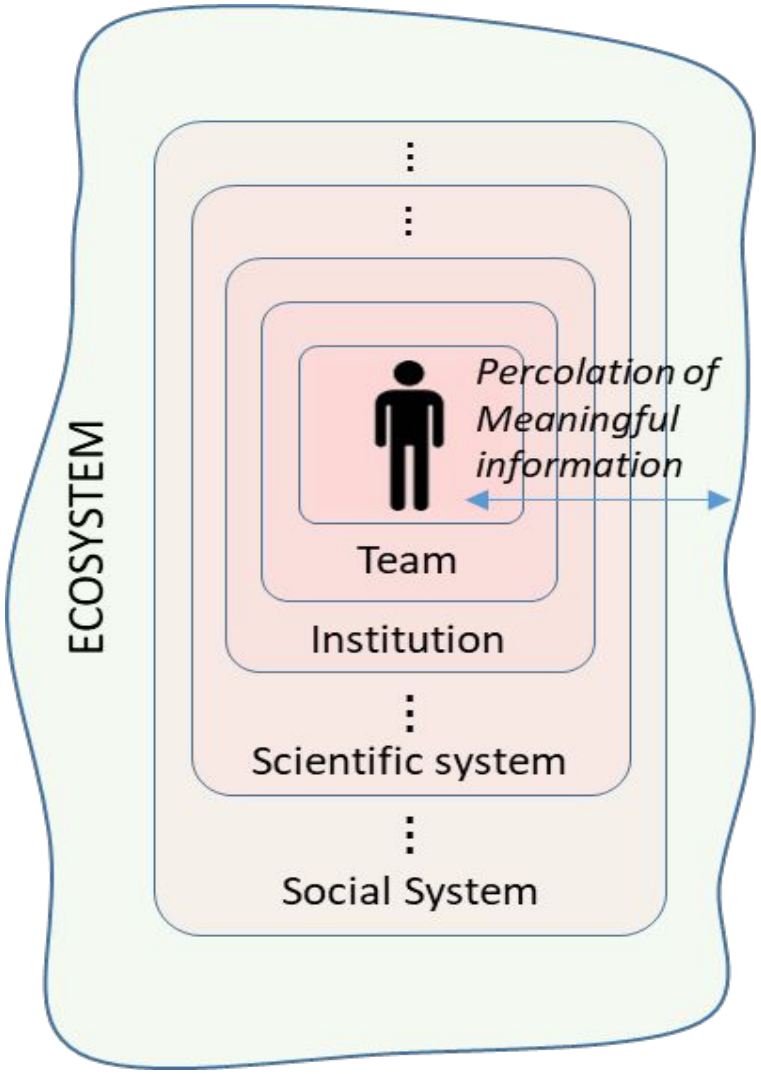
Hierarchical Network

Horizontal Network



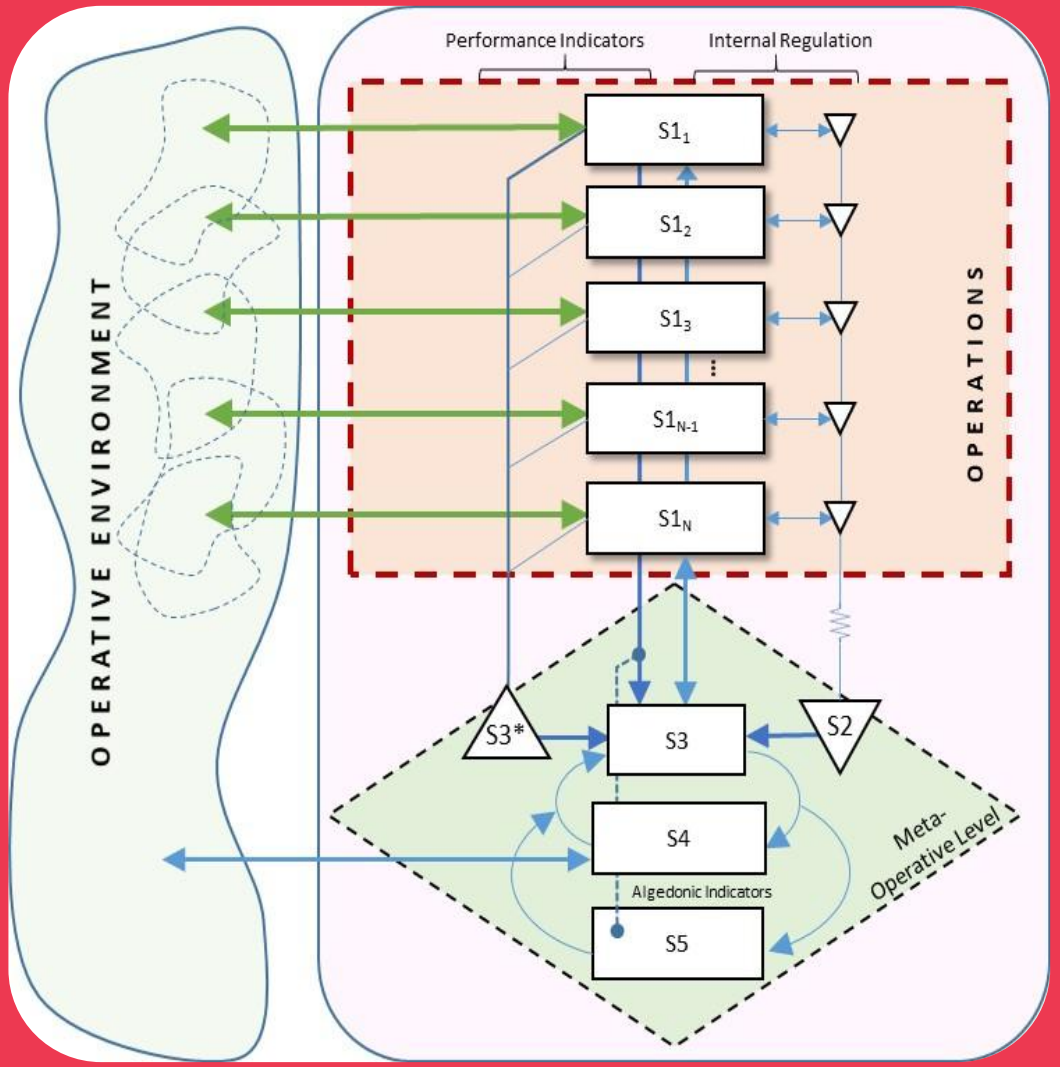
IS4SI

Autonomous agency?



Ashby's law of requisted variety:

$V_{org} > V_{ent,\ problem}$



Filtering: Performance indicators across organisational levels

At a given level *n*, the performance indicators, ***z***, will be:

Aggregated result of indicators from:

- the lower level (*n*-1) automatically **filtered**, *R*{.}, applying the **relevance rules** fixed at managerial level, and
- additional indicators, ***z'***, from own level activities

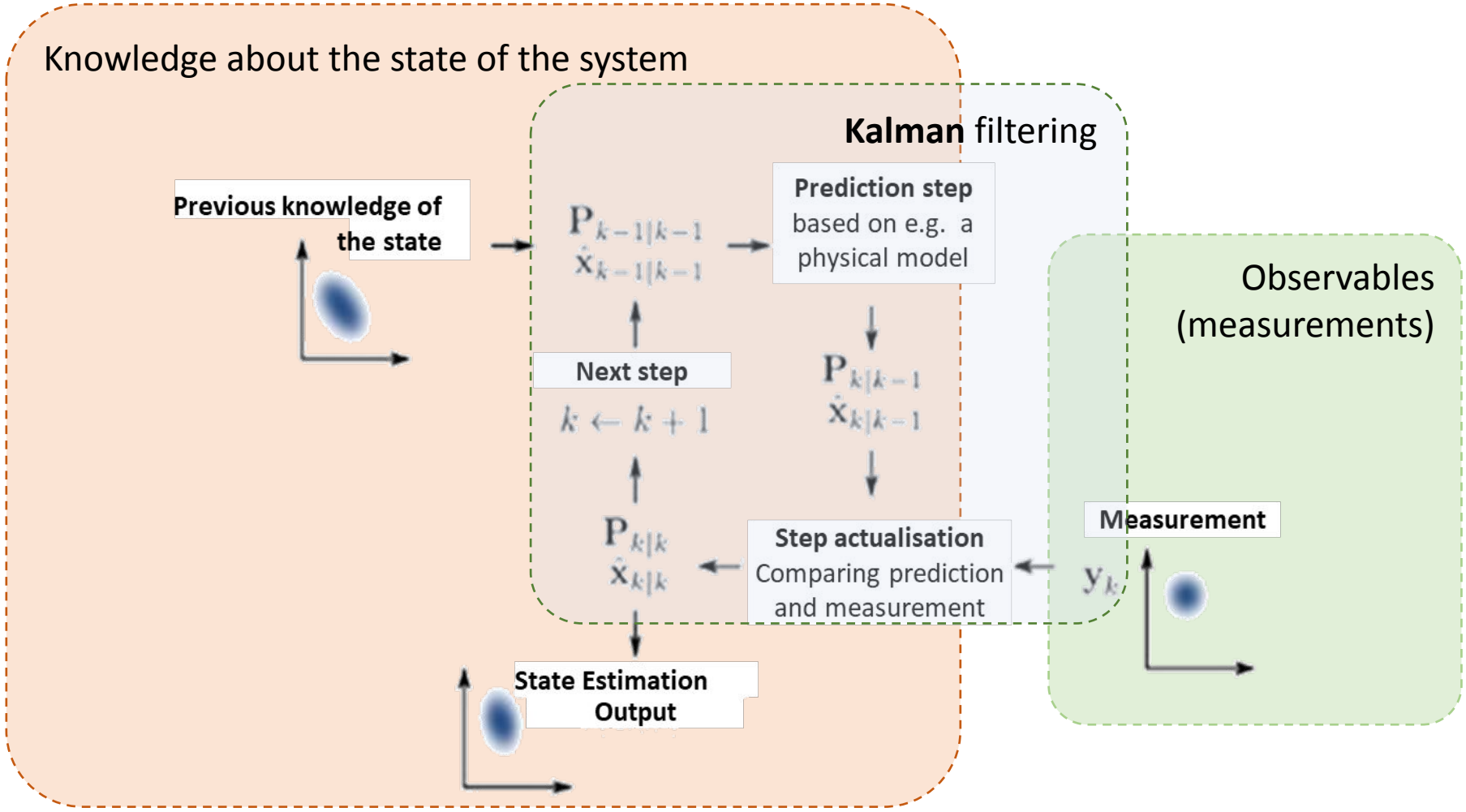
$$z_n = \{R\{z_{n-1}\};\ z_n'\}$$

Performance Indicators (level *n*)

Relevance filtering

Additional indicators (*innovation*)

Kalman filtering:
Unveriling systems performace beyond observation



Kalman filtering

The current state is determined by the transition from *previous state*, the effect of *control inputs* and processual *noise*:

$$\boldsymbol{x}_k = \mathbf{F}_k \boldsymbol{x}_{k-1} + \mathbf{B}_k \boldsymbol{u}_k + \boldsymbol{w}_k$$

Where: $\boldsymbol{x}_k$ represents the system's state in current iteration (k-1 is the previous one),

F the transition model,

B the control-input model,

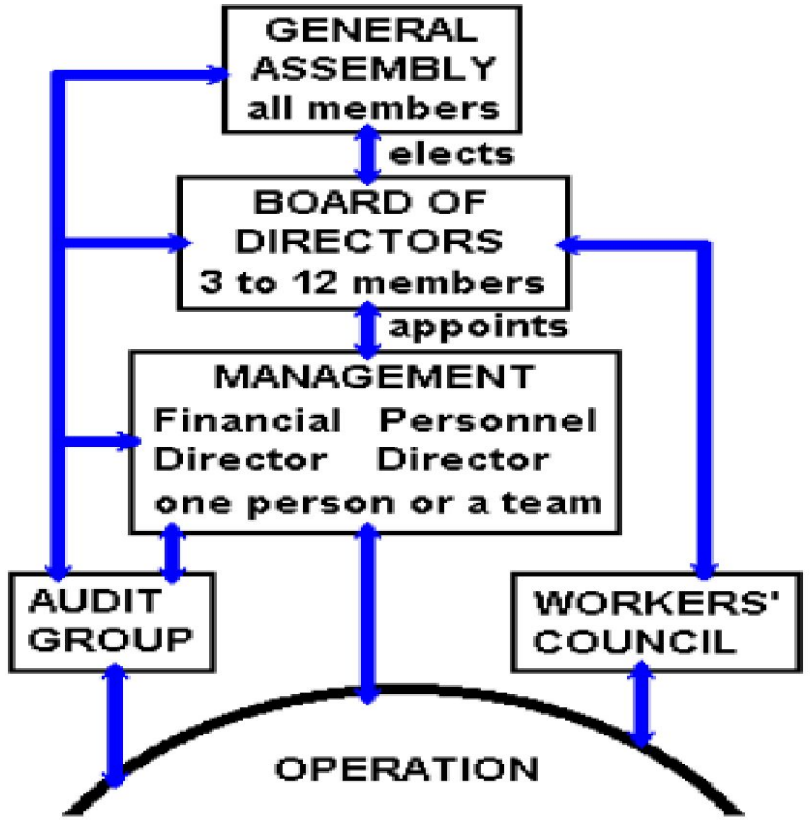
u the control-vector,

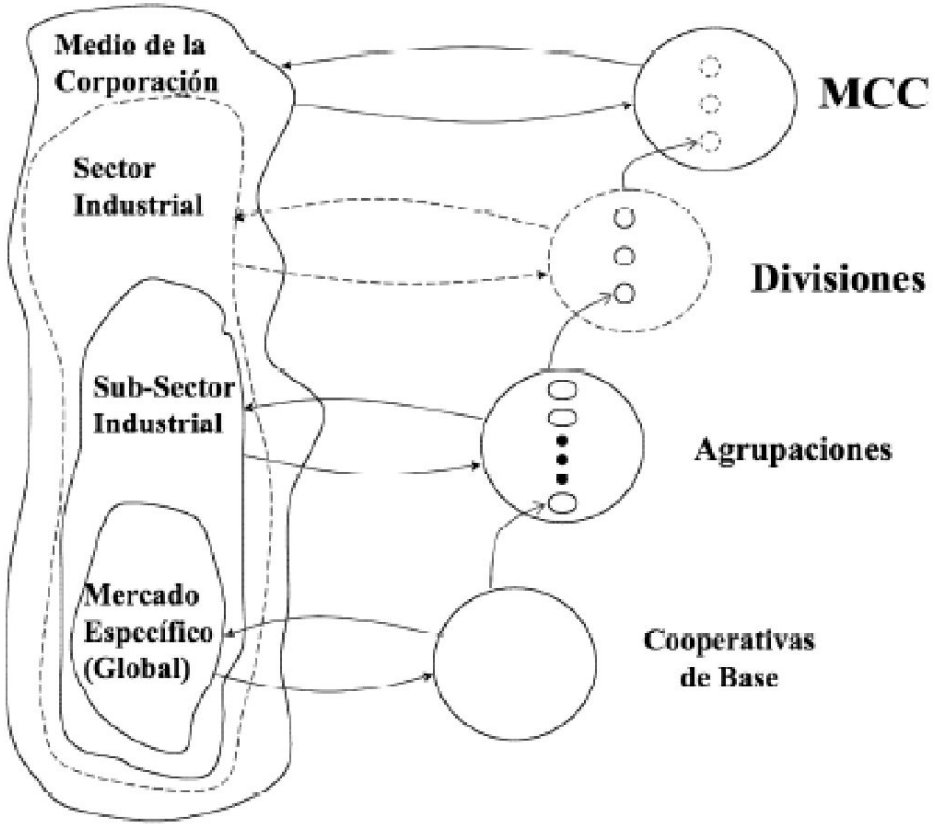
w the process noise (assumed to be Gaussian).

Cybersubsidiarity model applied to cooperative organisation: leveraging artisan fisheries in Ecuador

Mondragón Coops Group

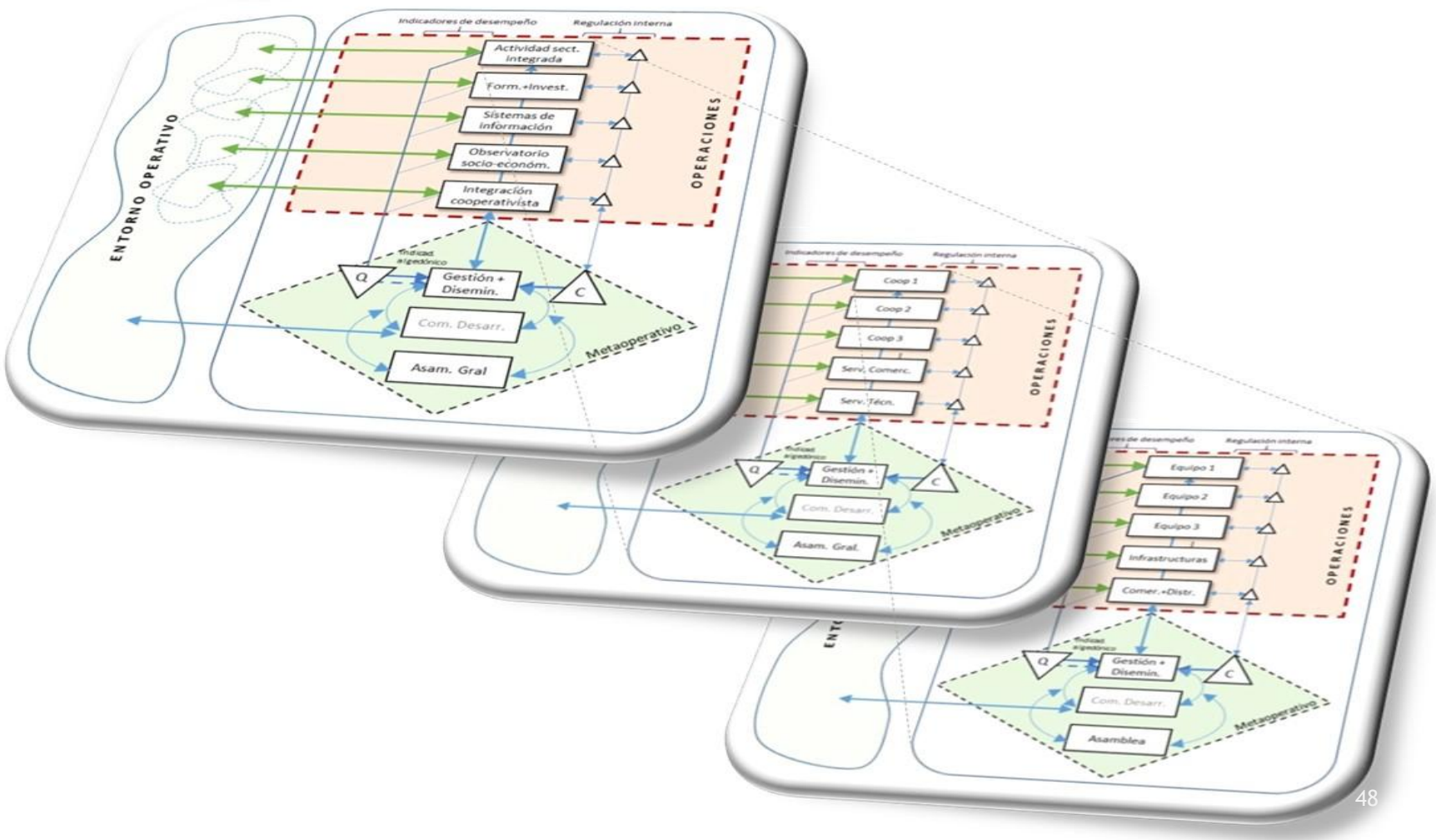
Cooperative level





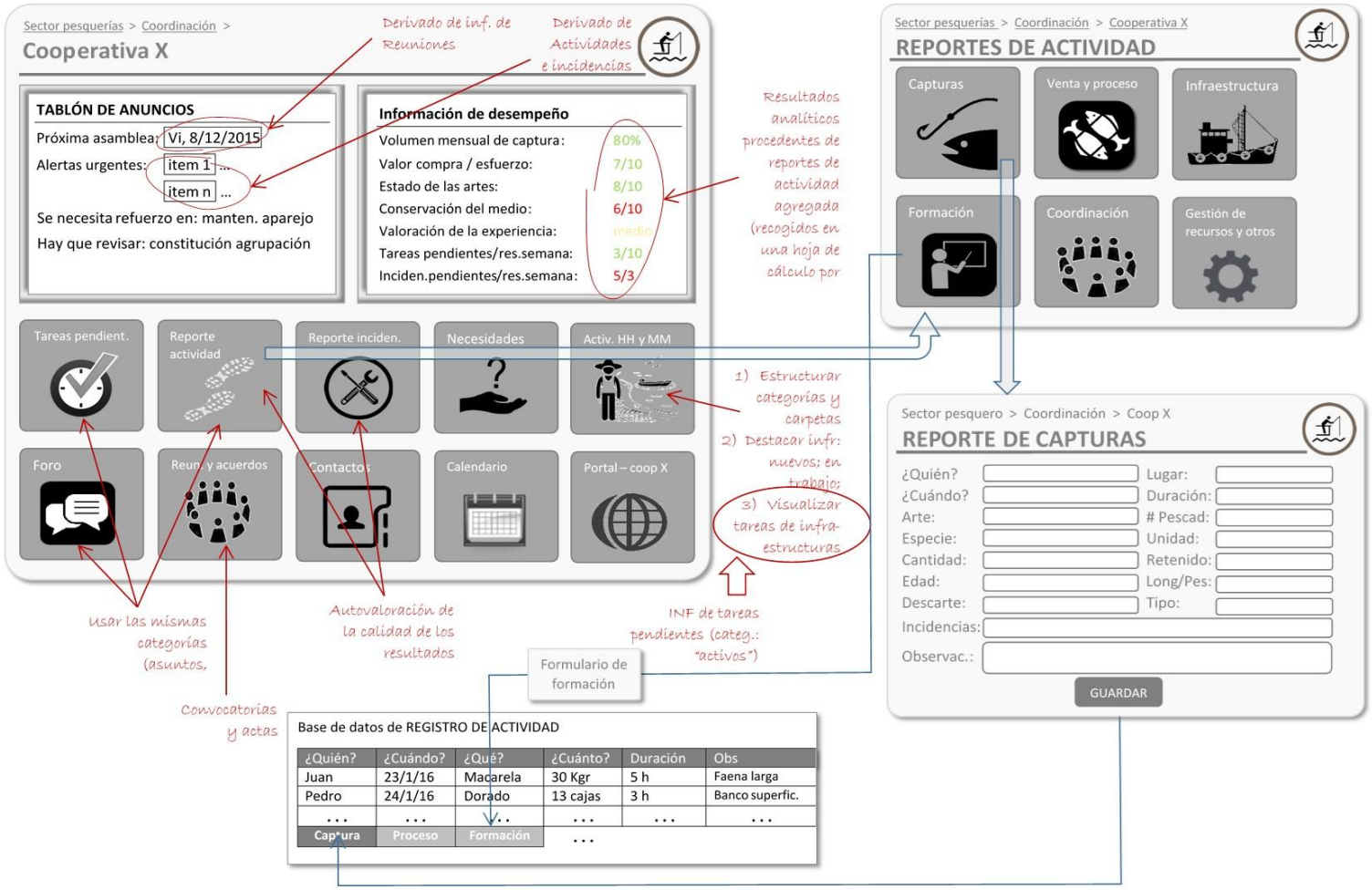
Cybersubsidiarity applied: leveraging artisanal fisheries in Ecuador

Nesting of organizational structures of the Fisher Development Unit



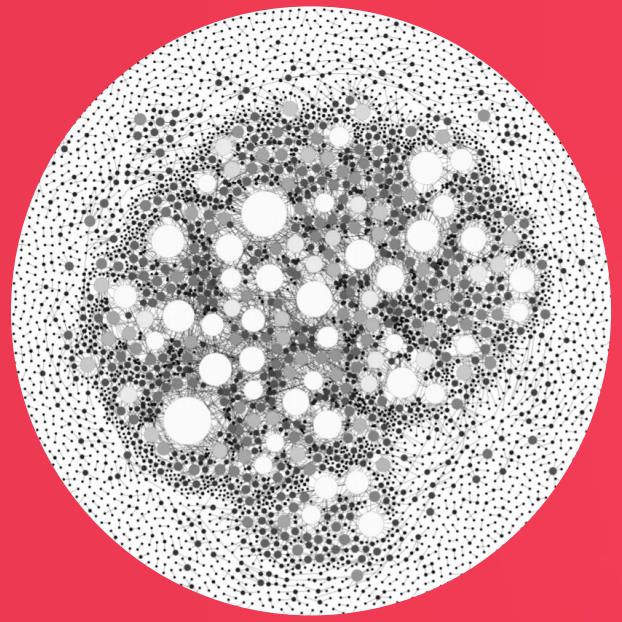
Cybersubsidiarity applied: leveraging artisanal fisheries in Ecuador

Information System for Coordination and Management



Cybersubsidiarity applied: leveraging artisanal fisheries in Ecuador

Mobile App for harvesting register



Thank you for your attention!

Utopia(s) Reloaded
Science, activism and the techno-eco-social transformation

Designing Interaction from the local to the global level

The role of interactive technologies in the deployment of adaptive constellations of social utopias

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