

Connected Intelligence in Scientific Research

Derrick de Kerckhove
dekerckh@gmail.com

Interdisciplinary
Internet Institute (IN3)

Barcelona

Media Duemila

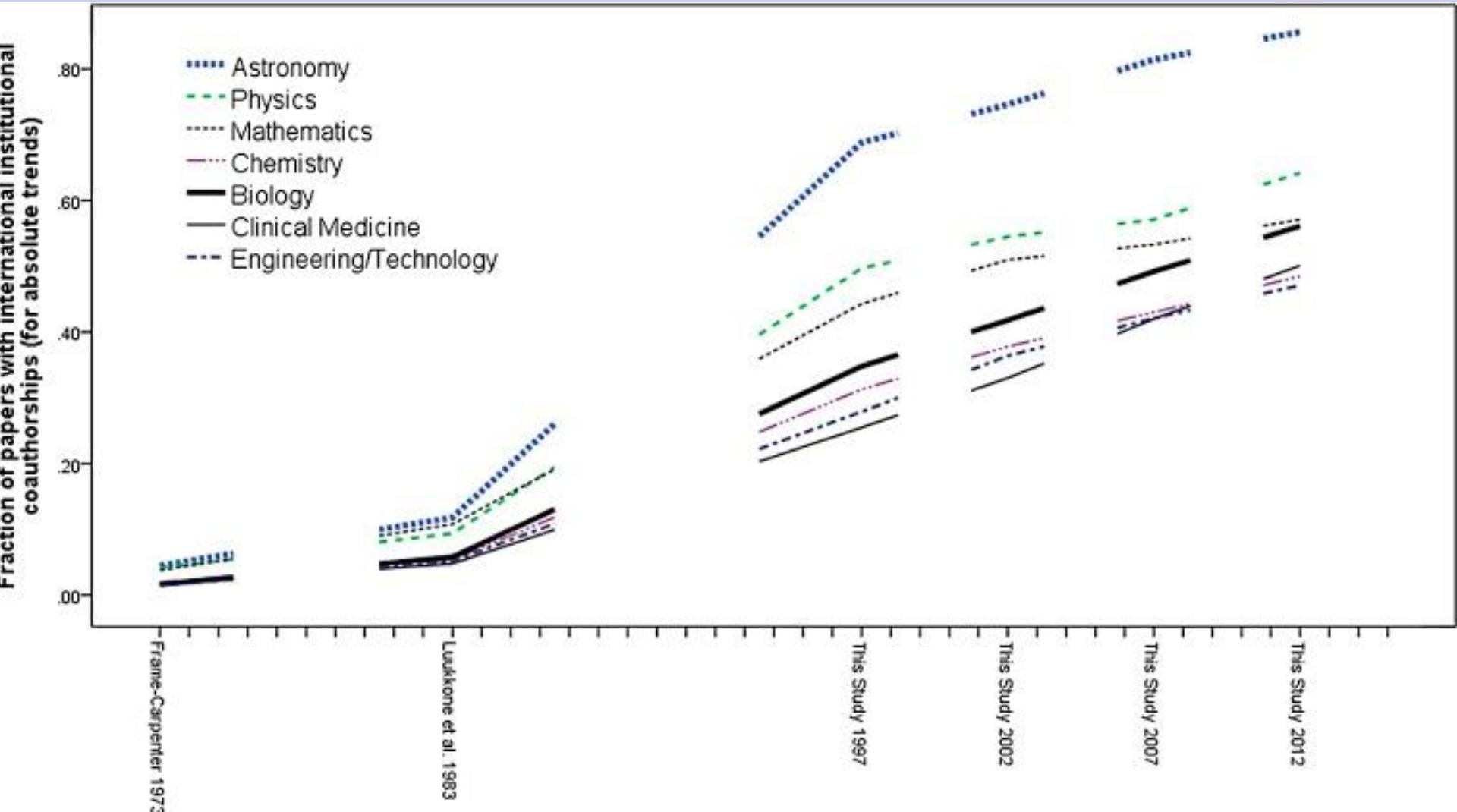
Rome

The Future of Science
23 September 2016
Fondazione Cini
Venice

Evolution and convergence of the patterns of international scientific collaboration

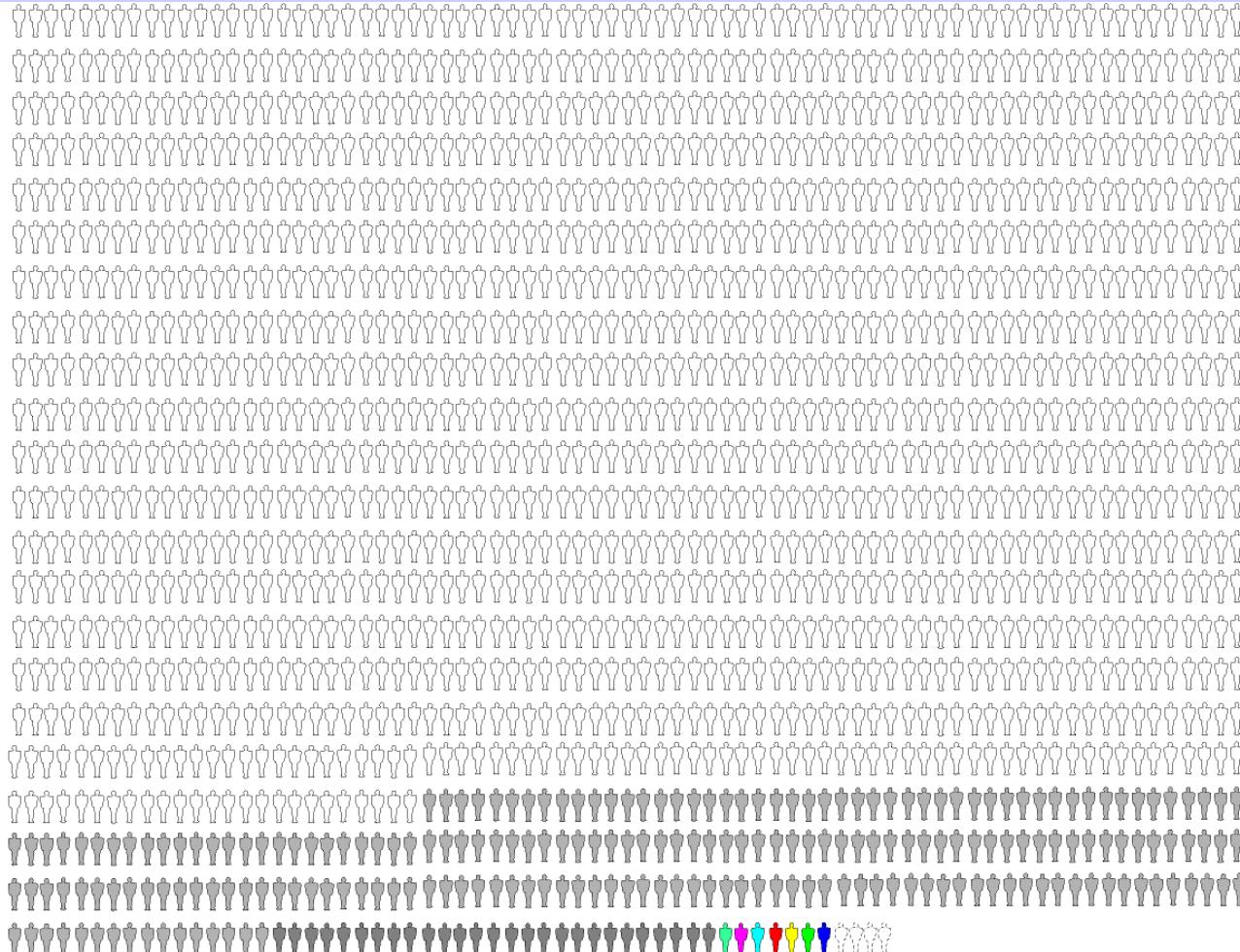
Mario Coccia and Lili Wang

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4776471/>



ACCELERATION OF CONNECTIVITY

1700
generations ago,
modern man
emerges and starts
developing
language



300 generations
ago, he develops
writing

35 generations ago,
he develops printing

and then...

-  2000 Always on / Web
- 1985 PC / Networking
- 1970 Fax / Electronics
- 1955 Television / MassMedia
- 1940 Radio / Talking films
- 1925 Telephone / Silent films
- 1910 Telegraph / Photography

LOCAL

global

- Telegraph
- Radio
- Telephone
- Television
- Internet
- WWW
- MOSAIC
- Yahoo
- Blog
- 3D worlds (objective imaginary)
- Social Media
- Internet of things
- Cloud Computing
- Big Data



The digital culture is
the cognitive phase
of electricity

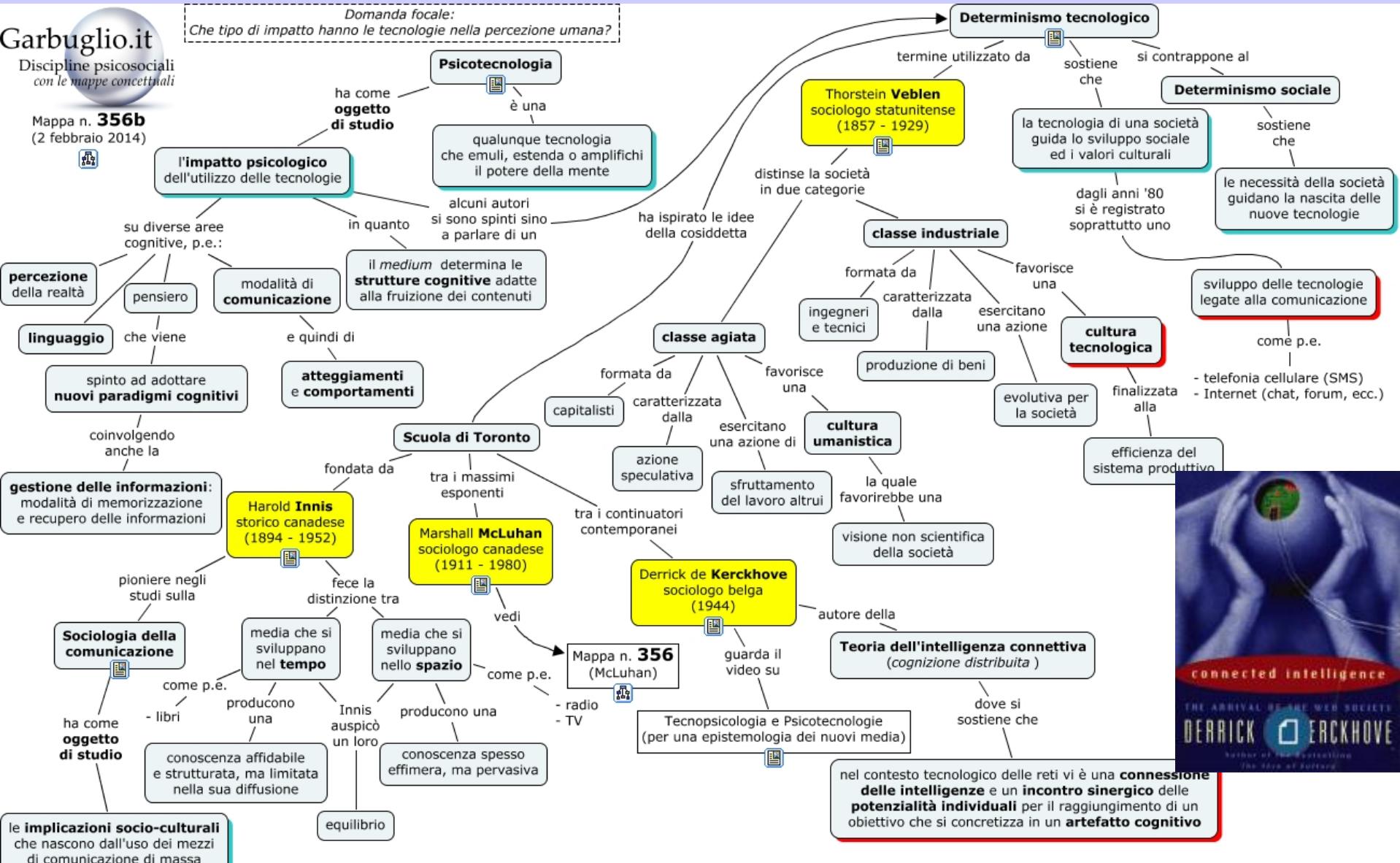
The great leap forward of scientific research

- CERN origin of the Big Bang of Internet
- WWW, an issue of connecting researchers
- Itself a benchmark example of intelligent connectivity



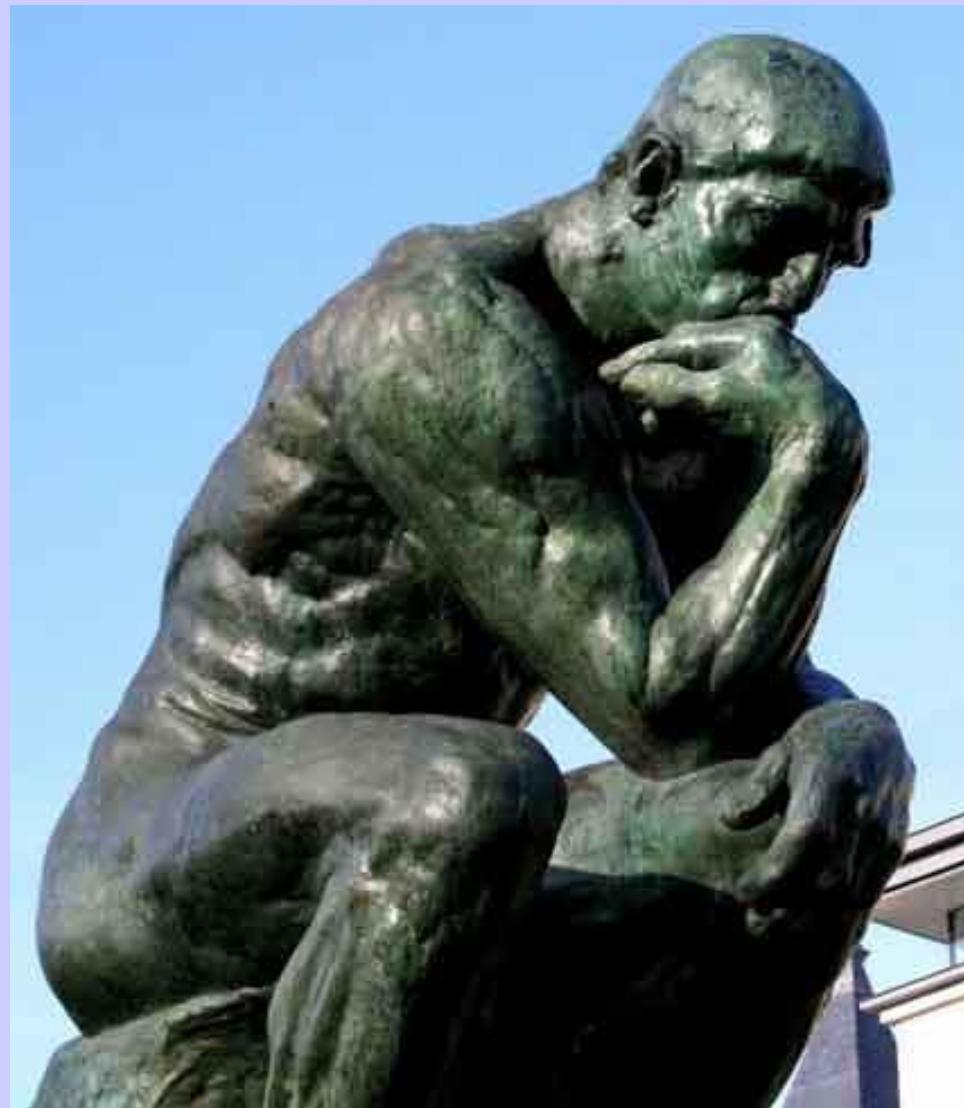
Connected intelligence

Mappa n. 356b
(2 febbraio 2014)



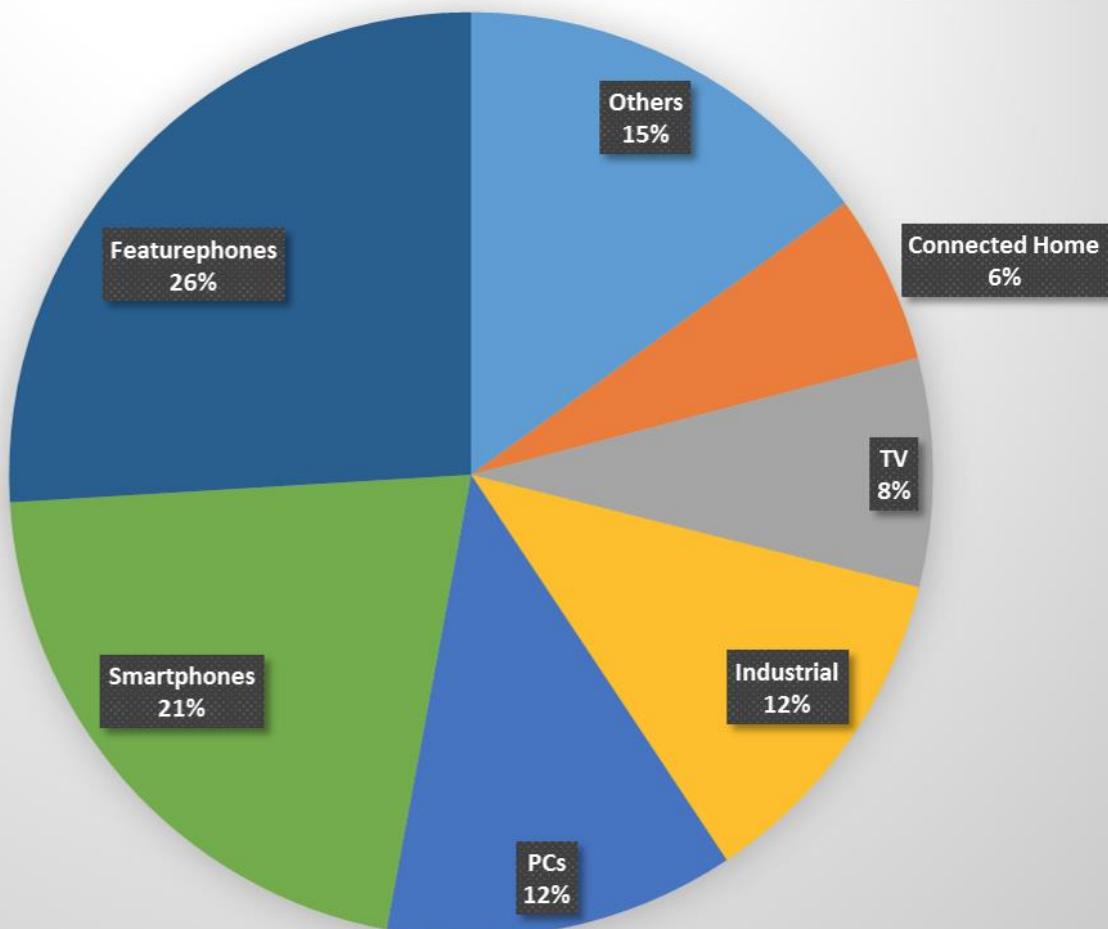
Social typology of intelligence

- Community (oral cultures)
- Private (literate cultures)
- Collective (Radio, TV)
- Connective (Internet)
- Relational (Web 2.0)
 - Hypertextual
 - Connected
 - Interactive



Total surround

Global Connected Devices
2015 Distribution
16 Billion



“As we may think”

Bboard, forum, MUD and MOO

Blog

Wiki
SMS

Skype
Second Life

Google
Snapchat

Twitter

Tagging, Social Bookmarking

Applications

Cloud Computing

Crowd sourcing

Crowd funding

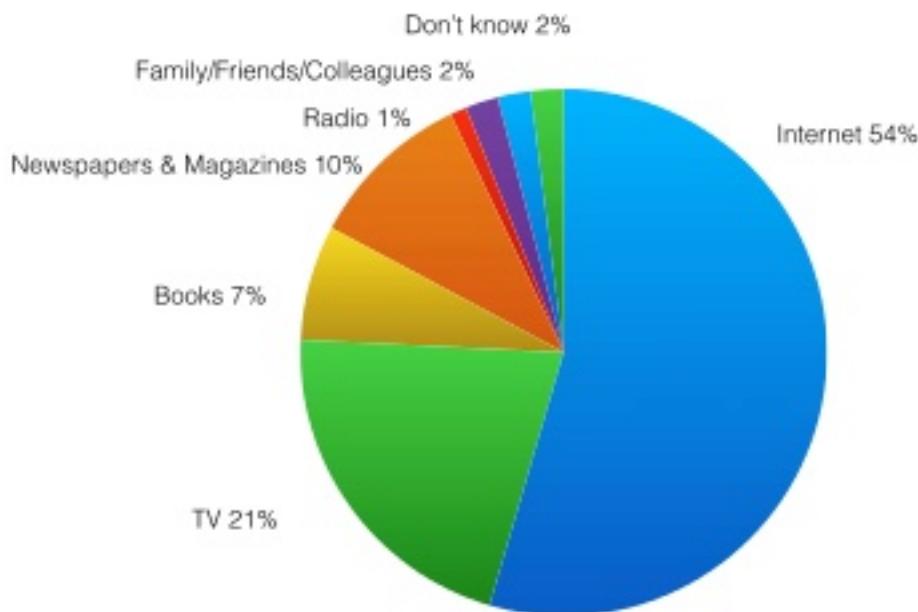
Open Data



Internet = Information

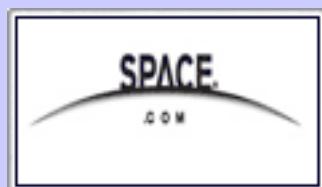
Where do you get information on **specific scientific issues**?

The Internet is the main source of information for learning about specific scientific issues such as global climate change or biotechnology

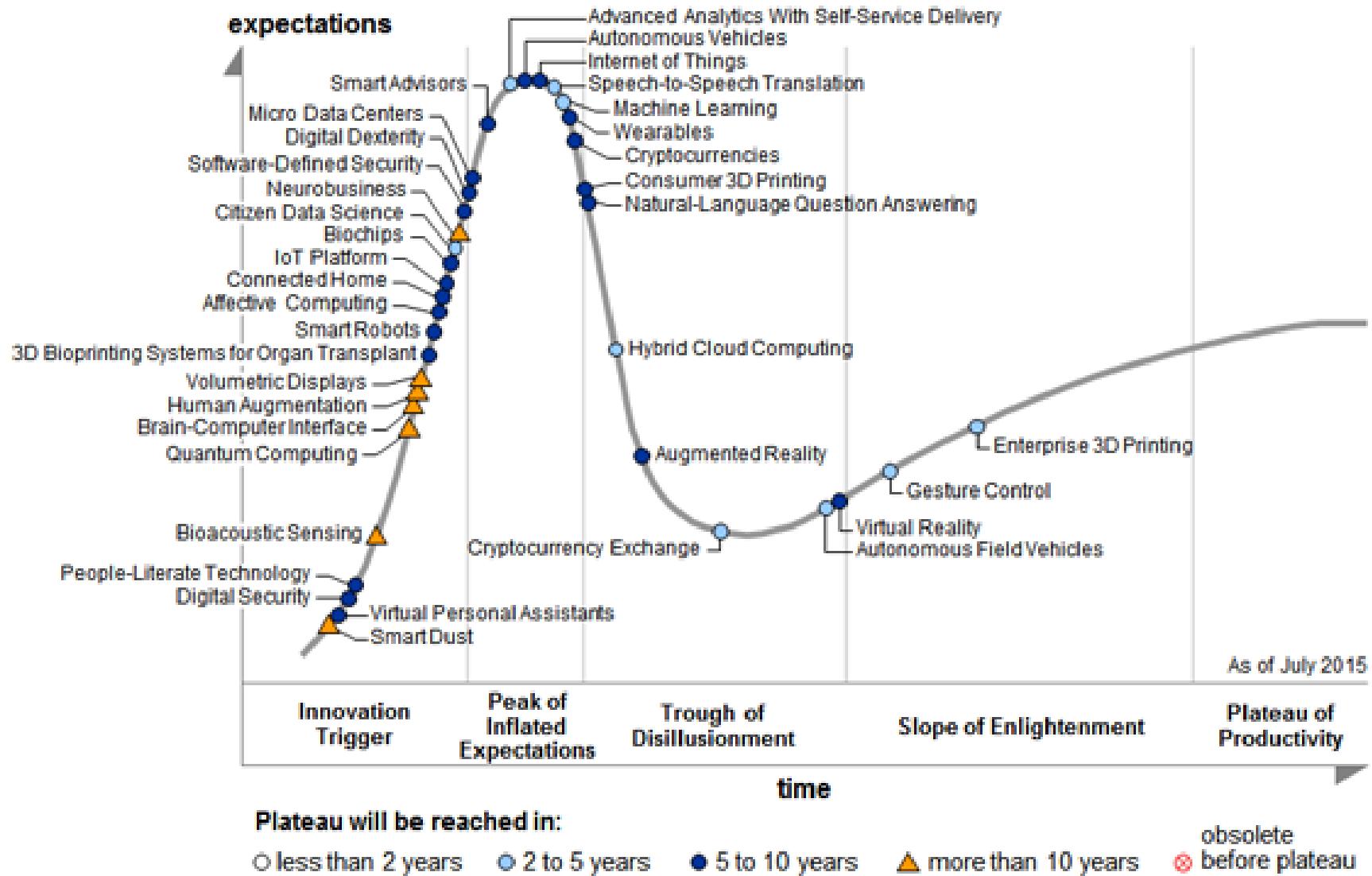


University of Chicago, National Opinion Research Center, General Social Survey (2008)

Top 15 Most Popular Science Websites | September 2016



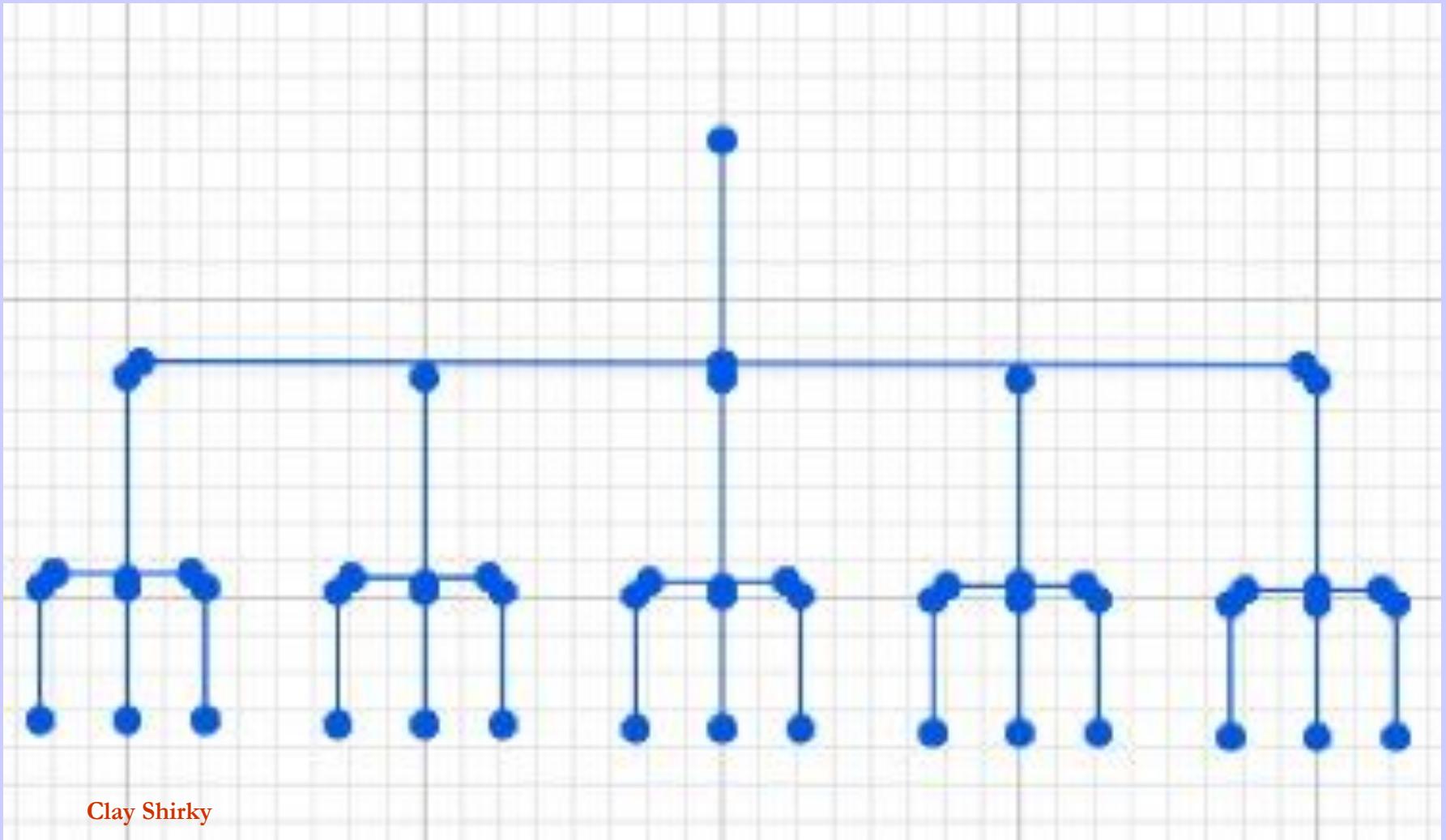
Gartner's hype cycle, 2015



A revolution in cognition

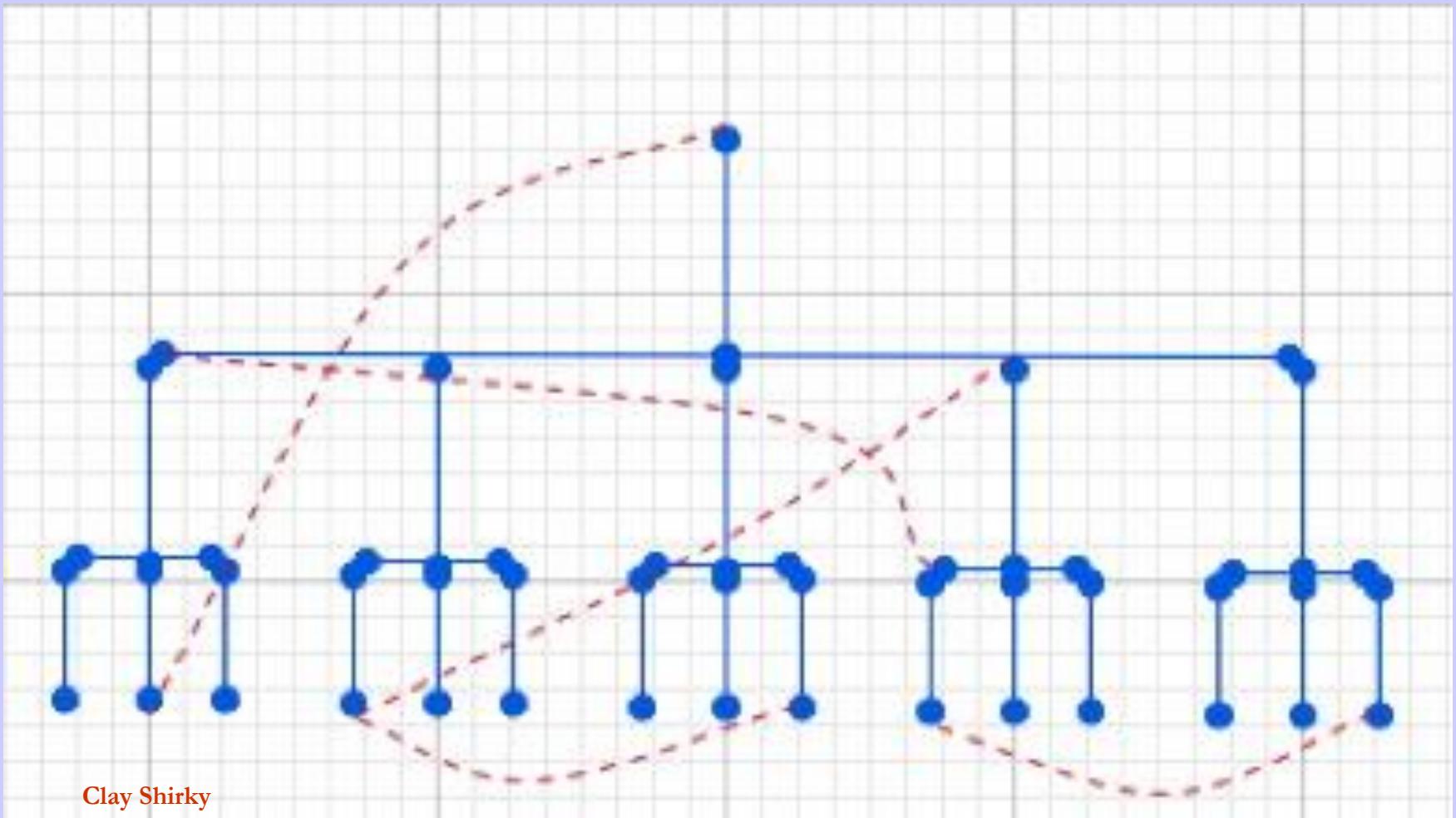
- Externalized (screenology)
- Published
- Shared
- Archived
- A new order of pertinence (hypertinence)

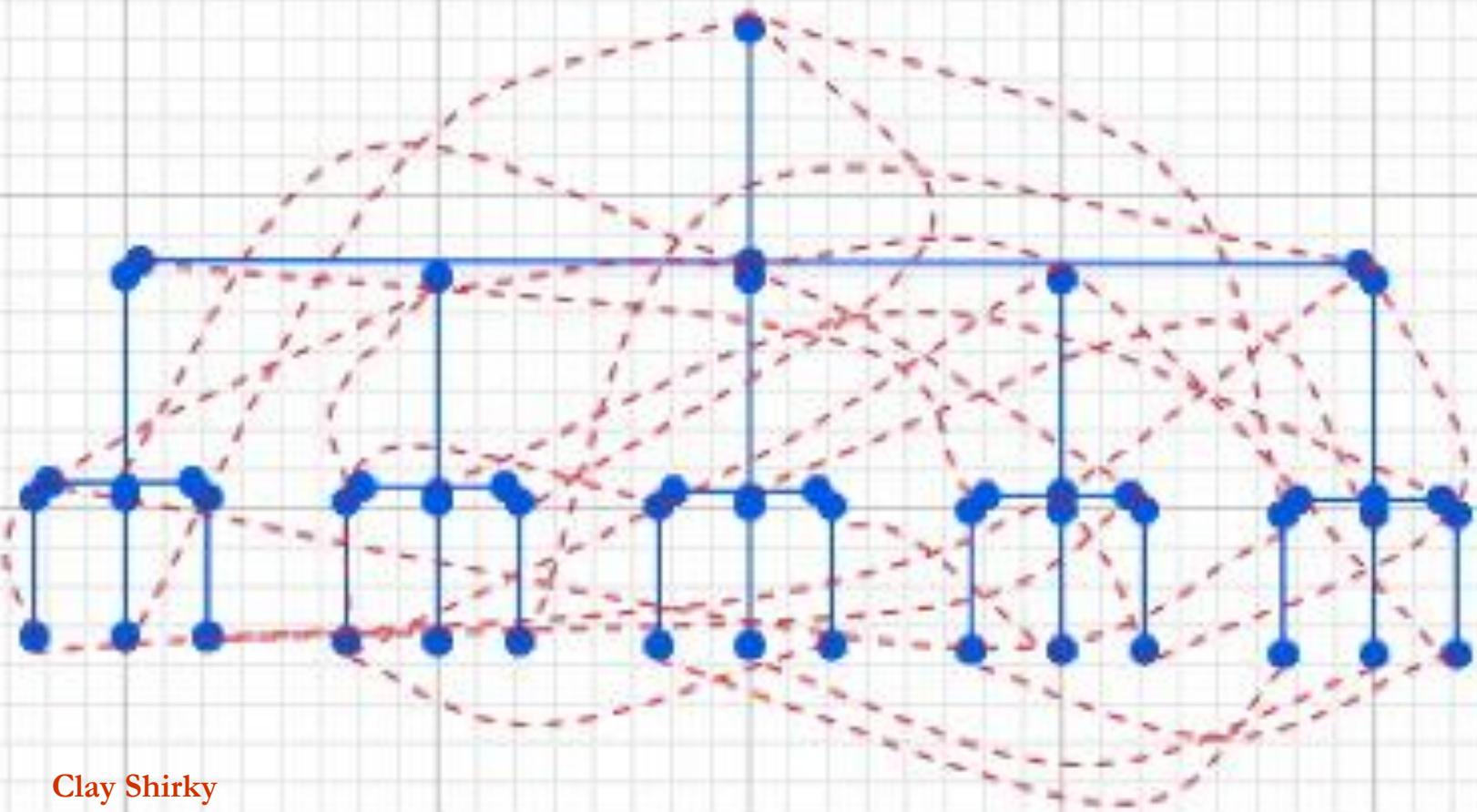
Hierarchy, first axis of pertinence



Clay Shirky

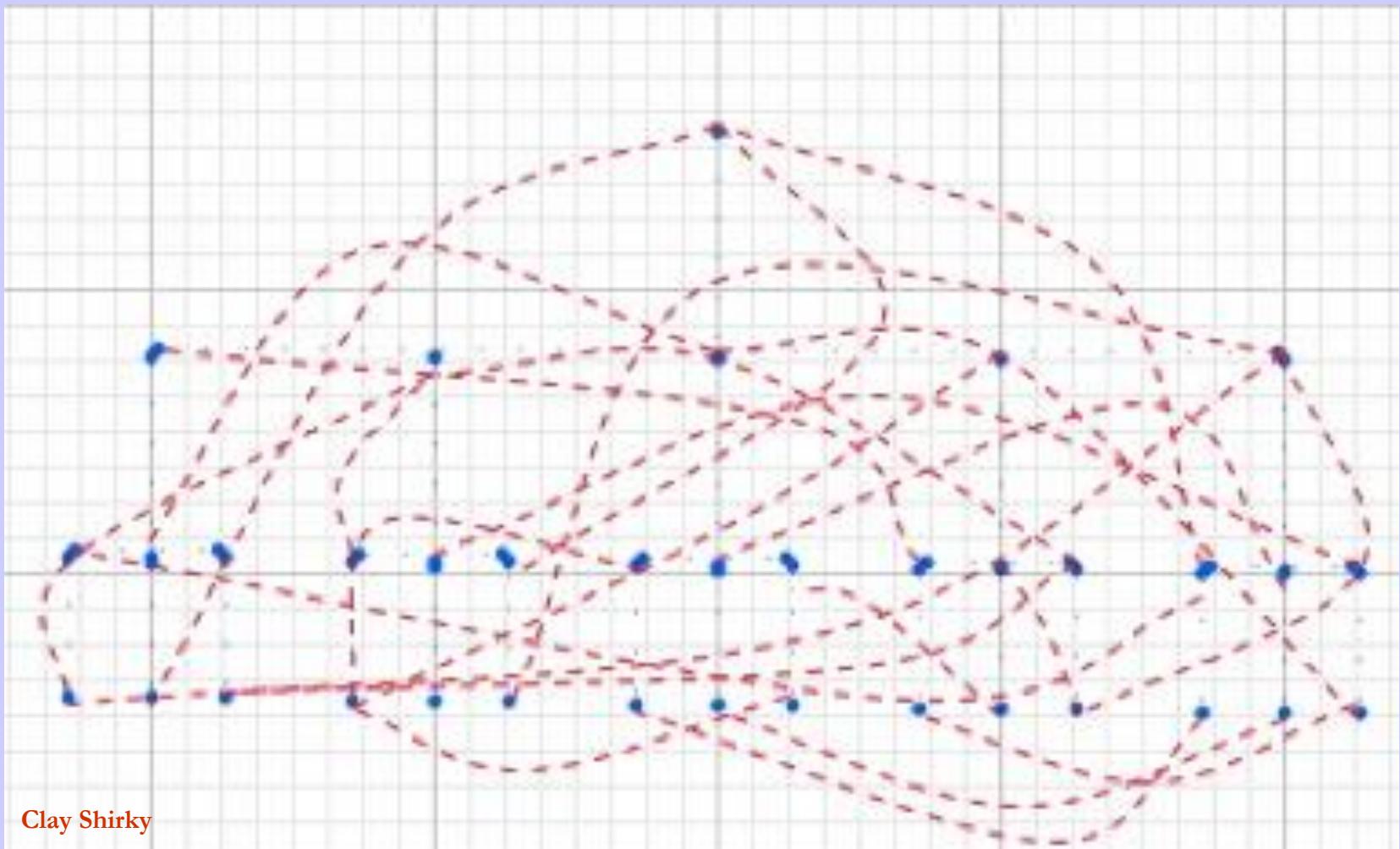
Tags interconnecting data



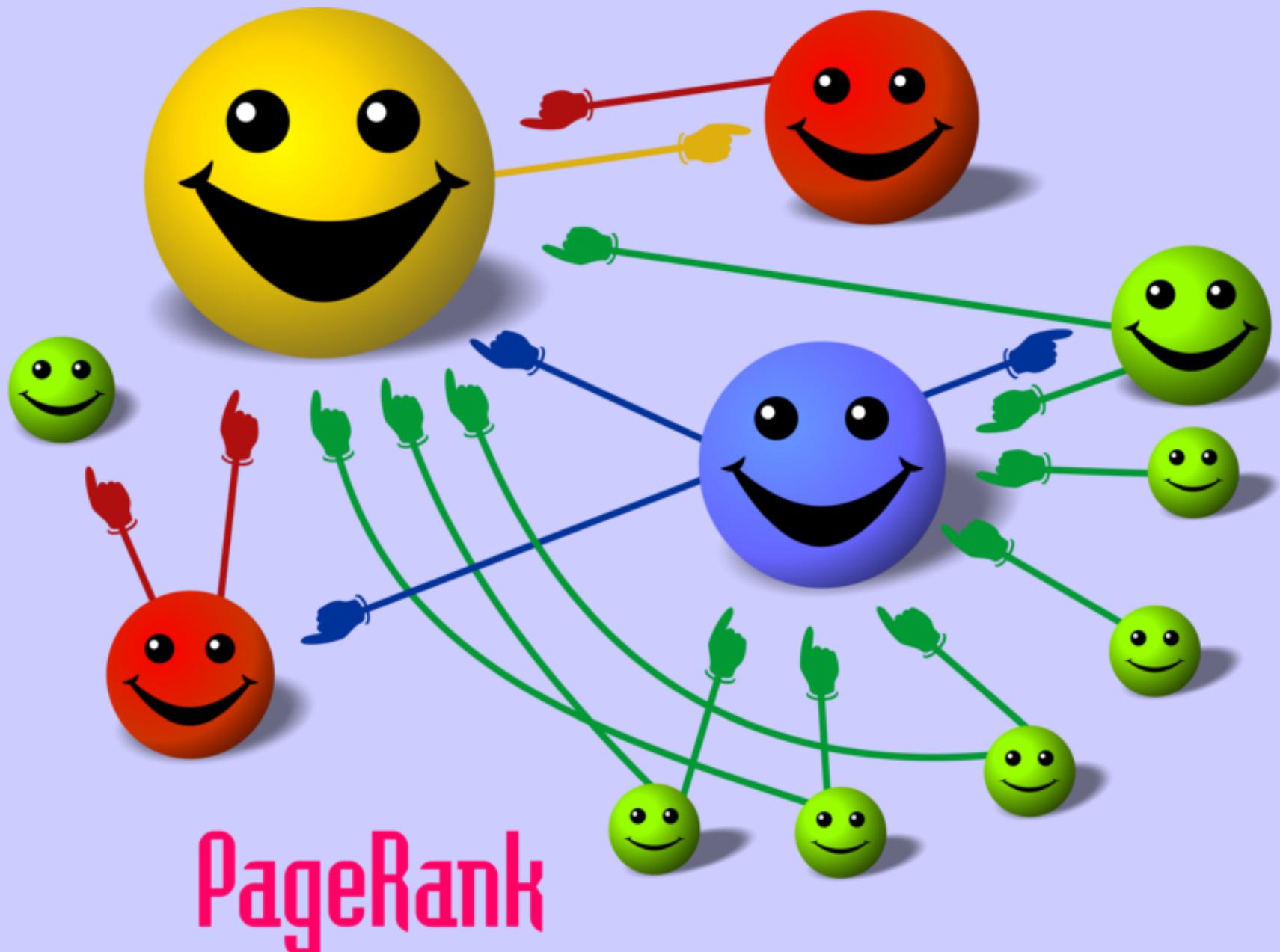


Clay Shirky

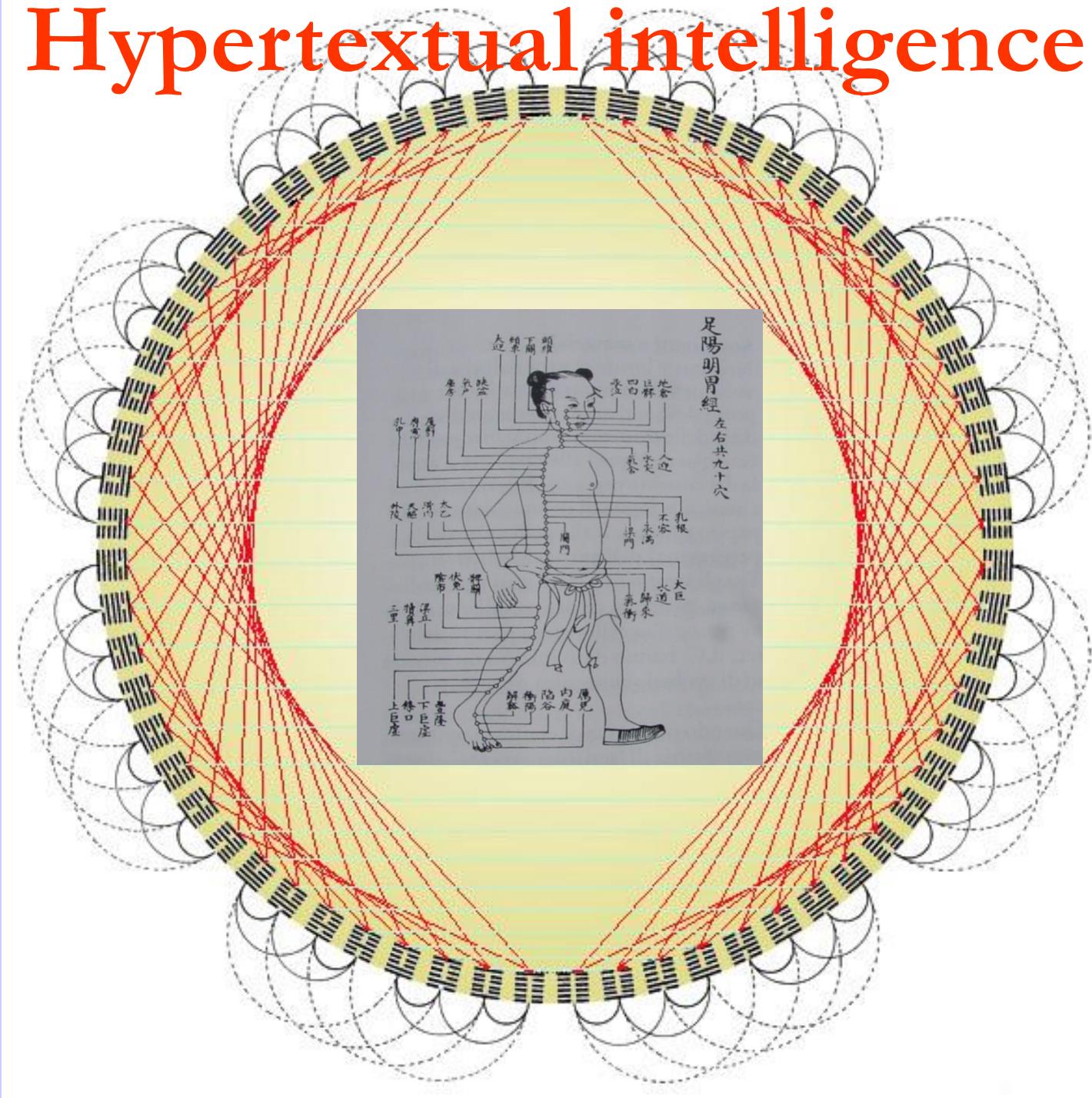
Association, second axis of pertinence



Weighting, third axis of pertinence



Hypertextual intelligence



New cognitive conditions

- Hyper-textual (information without limitation of format, carrier, time or space)
- Immersive (3D, Oculus Rift, total surround)
- Connective (relationship between things and people in new configurations)
- Interactive (people want to be involved)
- Participative (people want to share news, opinions, feelings recommendations, advice)

Signs of a new general mind shift

- Sharing one's mind with a screen 8h/day
- Publishing oneself in profiles, exporting self
- Going hypertextual on line, in mind, in life
 - Living in an unending present
- Sharing one's emotions with the world via Twitter, blogs, Youtube, Facebook



Social media behave as a social limbic system

Some emerging factors

- Augmented mind
- Context-aware computing
- Wearable social media and networks
- Digital unconscious and digital persona(e)
- Surveillance, face recognition, privacy invasion, fishing, identity theft, spy-wearing
- Internet of things
- Cloud computing
- Big Data

Big Data, the electronic oracular

- A paradigmatic shift in cognition
- Change of vector from connectivity to transparency, ubiquity and total surround
- Big Data moves science between experimental and theoretical

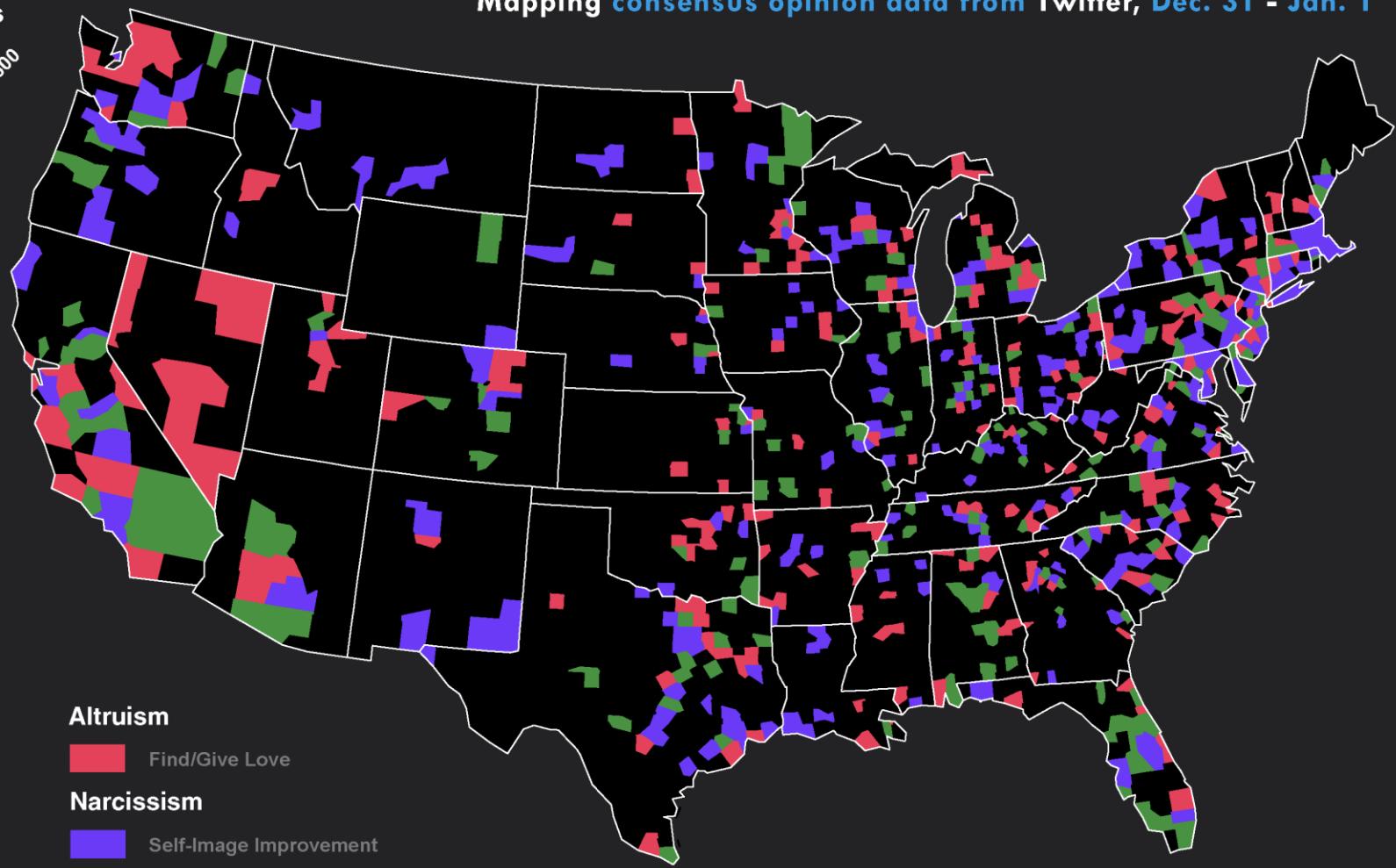
BIG DATA THE ELECTRONIC ORACULAR



@ New Years #Resolutions

Mapping consensus opinion data from Twitter, Dec. 31 - Jan. 1

#Resolution Tweets



What Big Data really is



- A huge, unlimited, collective and connective intelligent system...
- ...that has **NO** content...
- ...until you ask it a question.
- So the real job is the question, not the answer

The consequences of this evolution

- Migration of the mind from the head to the screen
- Role-shift from that of spectator to that of user
- Changes in strategies of memory and intelligence
- Development of a new epistemology
- Invasion of the interior

FaceBook

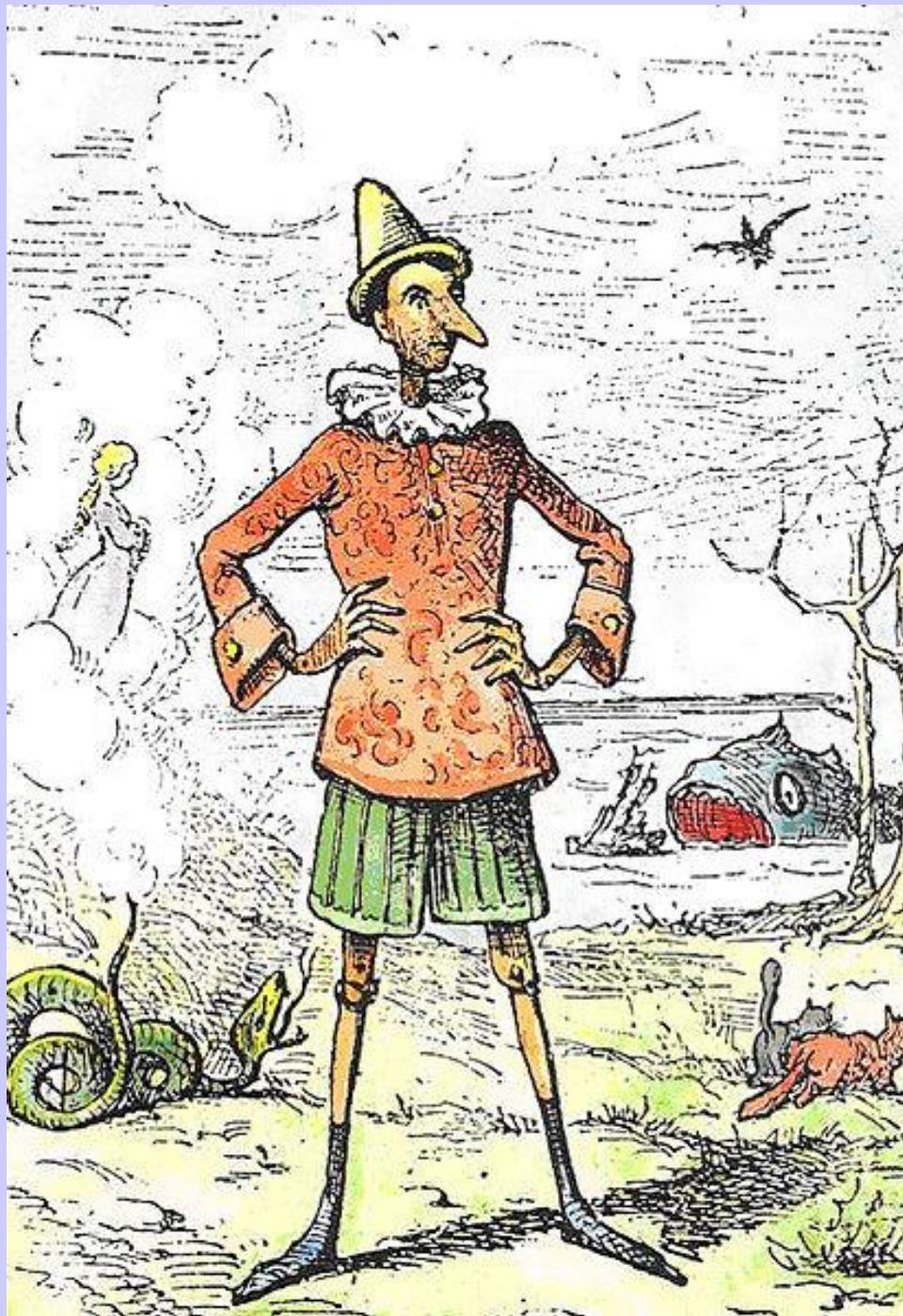
To grow up in a modern electronic environment is a fantastically complex job. One of the peculiarities of an electronic environment is that people become so profoundly involved with each other that they lose the sense of private identity (McLuhan 1966).



Salvatore Iaconesi

"We find ourselves in a digital Third Space, more inclusive, in which information is not only attached to places, spaces, bodies and objects, but constantly recombines, remixes, recontextualizes, creating constantly new geographies which are emotional, linguistic, semantic, relational, or relative to the many patterns which non-human algorithms can glimpse in the ways in which layers emerge from data, information and knowledge, correlating different spaces, times and human networks".

[The Third Infoscape. Data Information and Knowledge in the city. New paradigms for urban interaction](https://www.researchgate.net/publication/279196590)



Pinocchio 2.0

- DIGITAL UNCONSCIOUS
 - DIGITAL PERSONA
 - EMOTICONS (I like)

Pedagogical implications

- It is absurd for any educational institution not to educate children to the practice and criticism of Internet use
- Over 50% of children in advanced economies and a rising proportion in developing countries will earn their living and contribute to the economy with networks one way or the other
- More study should go into learning about the effects of using media on cognitive responses

- Today, there isn't yet a formal standard of what skills everybody needs to acquire in the context of rapidly augmenting challenges to:
 - identity
 - information control
 - relationship management.

The education of Pinocchio 2.0



Basic: reading, writing and arithmetic (the 3 Rs)

How to do research

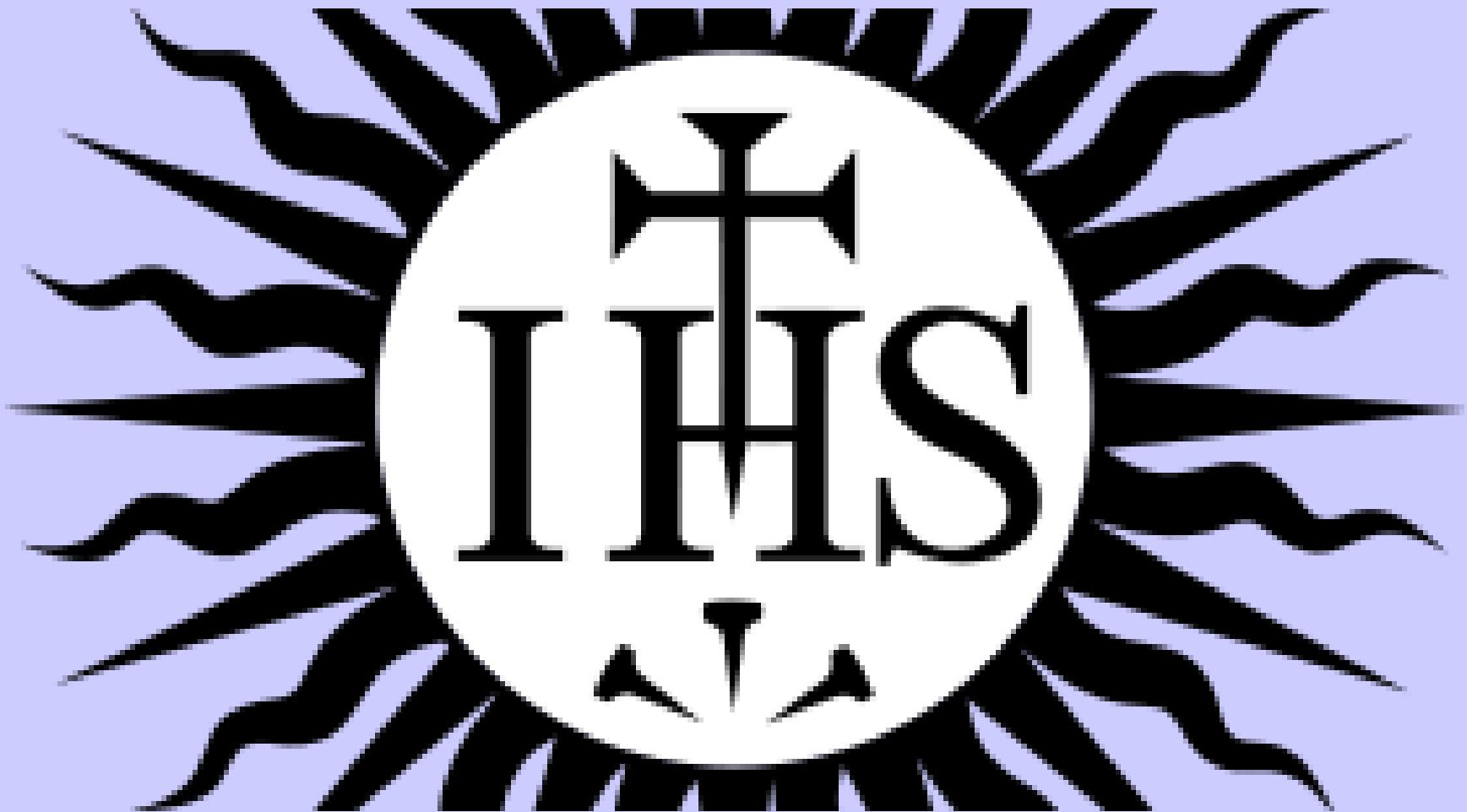
How to collaborate

**In Big Data, we have all the answers, what are the
questions?**

Transmedia literacy (video, mash-up, apps, ecc.)

How to use and fight abuse of Social Media

E-jesuits



[H27] RULES FOR THE PROFESSOR OF HUMANITIES

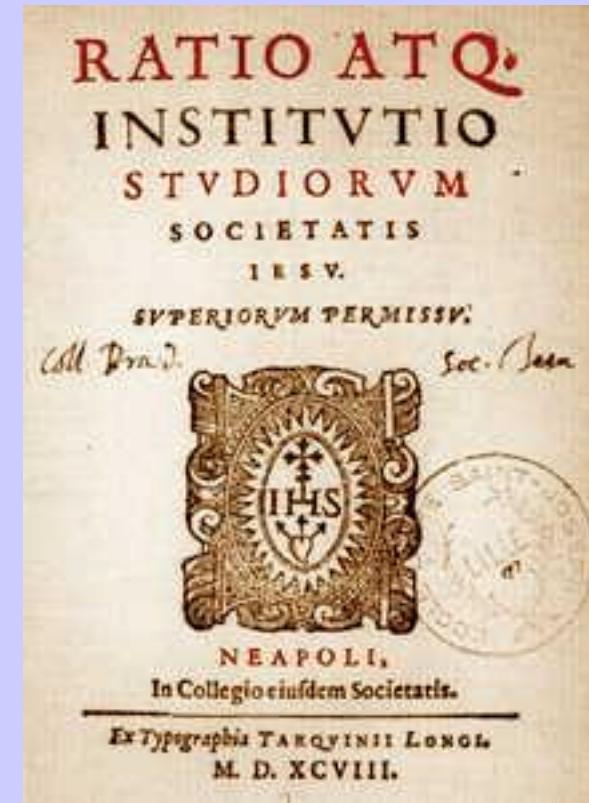
[a. 395] Grade - 1. The grade of this class consists in the preparing of the ground, as it were, for eloquence, after the students have passed beyond the stage of grammatical study.

This preparation happens in a three-fold way: by an understanding of the language, by some scholarly learning, and by getting a summary notion of the rules pertaining to rhetoric. For the knowledge of the language, which consists especially in propriety and abundance of expression, the daily lessons should

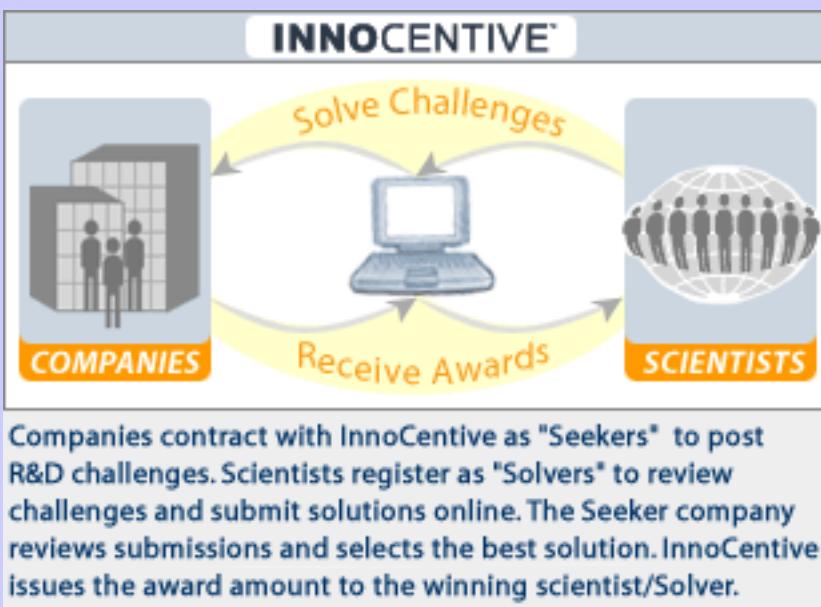
be devoted to teaching Cicero alone of the orators, usually through those books that contain his moral philosophy; Caesar, Sallust, Livy, Curtius, from the historians, and any others like these; from the poets, especially Vergil, setting aside the Eclogues and the fourth book of the Aeneid; in addition, select odes of Horace, and likewise, elegies, epigrams, and other poems of famous ancient poets, providing that they have been expurgated of everything indecent and offensive. (1599)

Its not a question of learning to program (although that might prove useful too)

- Skills such as...
- -collaborative practice
- -profile management
- -reputation management
- -network ethics
- -searching strategies
- -aesthetics and design
- -social media skills
- -transmedia literacy should be considered as mandatory as learning to read and write.



The future of education



There is no kind of problem that baffles one or a dozen experts that cannot be solved at once by a million minds that are given a chance simultaneously to tackle a problem. The satisfaction of individual prestige, which we formerly derived from the possession of expertise, must now yield to the much greater satisfactions of dialogue and group discovery. The task yields to the task force.

(McLuhan and Leonard 1967)

Still missing

- Collaboration isn't supported by existing and applied pedagogical methods in early education.
- What strategies in schools and universities would ensure that focused and fruitful collaboration between students and their teachers be given priority status?
- What benefits would result?

Problems with on line scientific research

- Verification
- Collusion
- North-Divariant
- Encryption and its consequences



The big question
is still to know
whether there
should be global
standards or
whether the
system should be
allowed to self-
organize

- Google Scholar (<http://scholar.google.com/>)
- CiteSeer (<http://citeseerx.ist.psu.edu>)
- GetCITED (<http://www.getcited.org/>)
- Microsoft Academic Research
(<http://academic.research.microsoft.com/>)
- Bioline International (<http://www.bioline.org.br/>)
- Directory of Open Access Journals (<http://www.doaj.org/>)
- PLOS ONE (<http://www.plosone.org/>)
- BioOne (<http://www.bioone.org/>)
- Science and Technology of Advanced Materials
(<http://iopscience.iop.org/1468-6996/>)
- New Journal of Physics (<http://iopscience.iop.org/1367-2630>)
- ScienceDirect (<http://www.sciencedirect.com/>)