mit media lab

MIT Connection Science
enhancing cultural intelligence through technology

DATA-POP ALLIANCE

OPAL
open algorithms for better decisions

How Big Data, Open Algorithms and Artificial Intelligence Can Drive Smart Cities and Societies: Towards Human AI Ecologies

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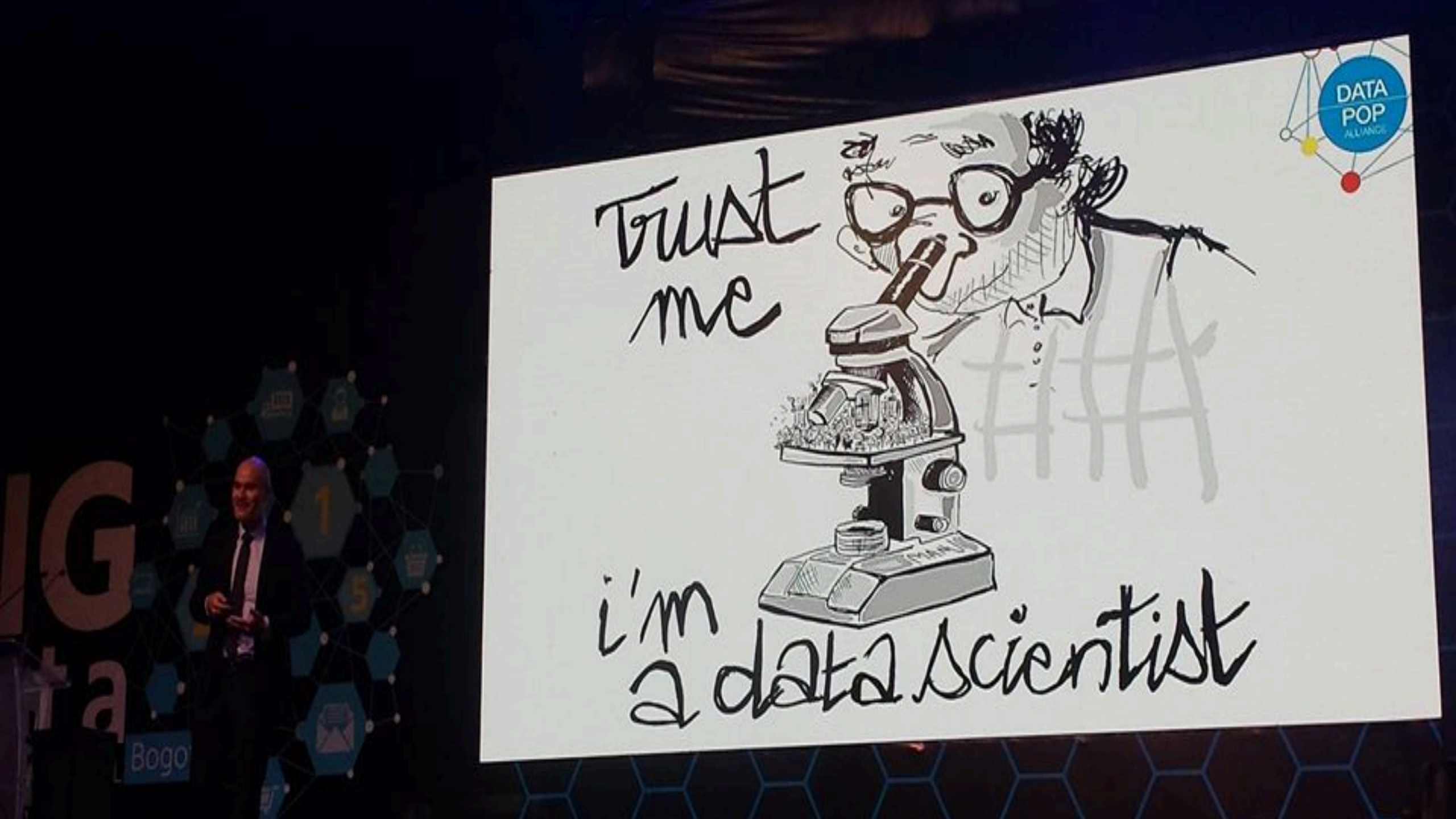
Smart Statistics 4 Smart Cities

SmartStatistics4SmartCities Seminar

Kalamata, Greece, Oct 5-6 2018


DATA
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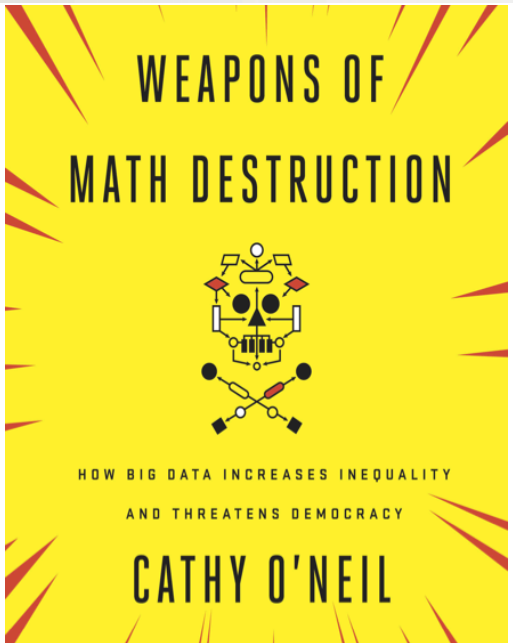
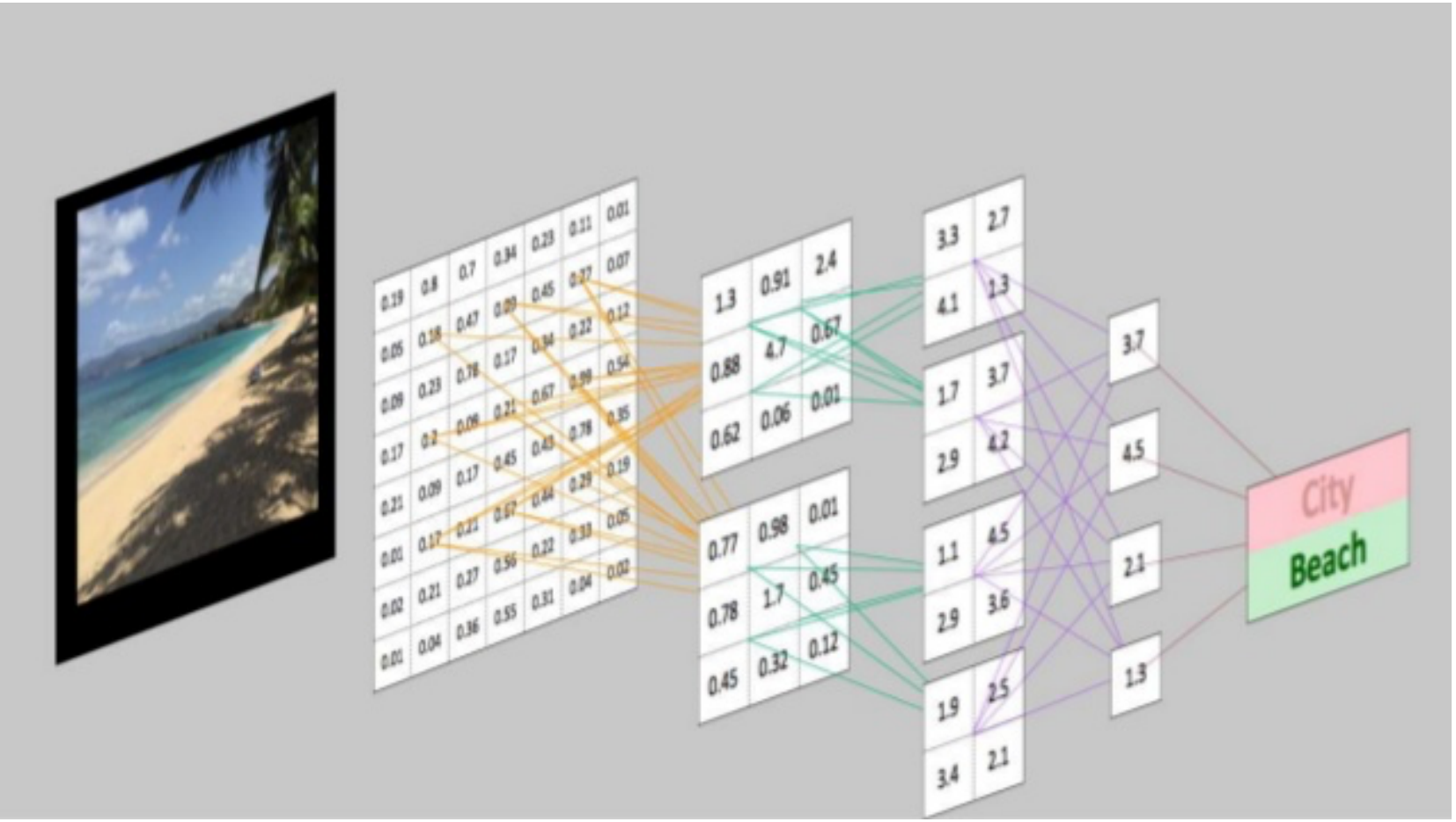
ALLIANCE
Trust
me
i'm
a data scientist



- Fake news. Biases. Automation. Echo chambers. Information overload. CO_2 emissions…
- (Big) Data is getting a bad name. Are data, algorithms and AI threats to sustainable development and democracy?
- Can we instead envision and build a world where Big Data, Open Algorithms and AI drive better, fairer, more sustainable and more resilient cities and societies?
- Let’s call these ”Human Artificial Intelligence ” ecologies. What would it look like, and take?

How do(es) AI(s) Work?

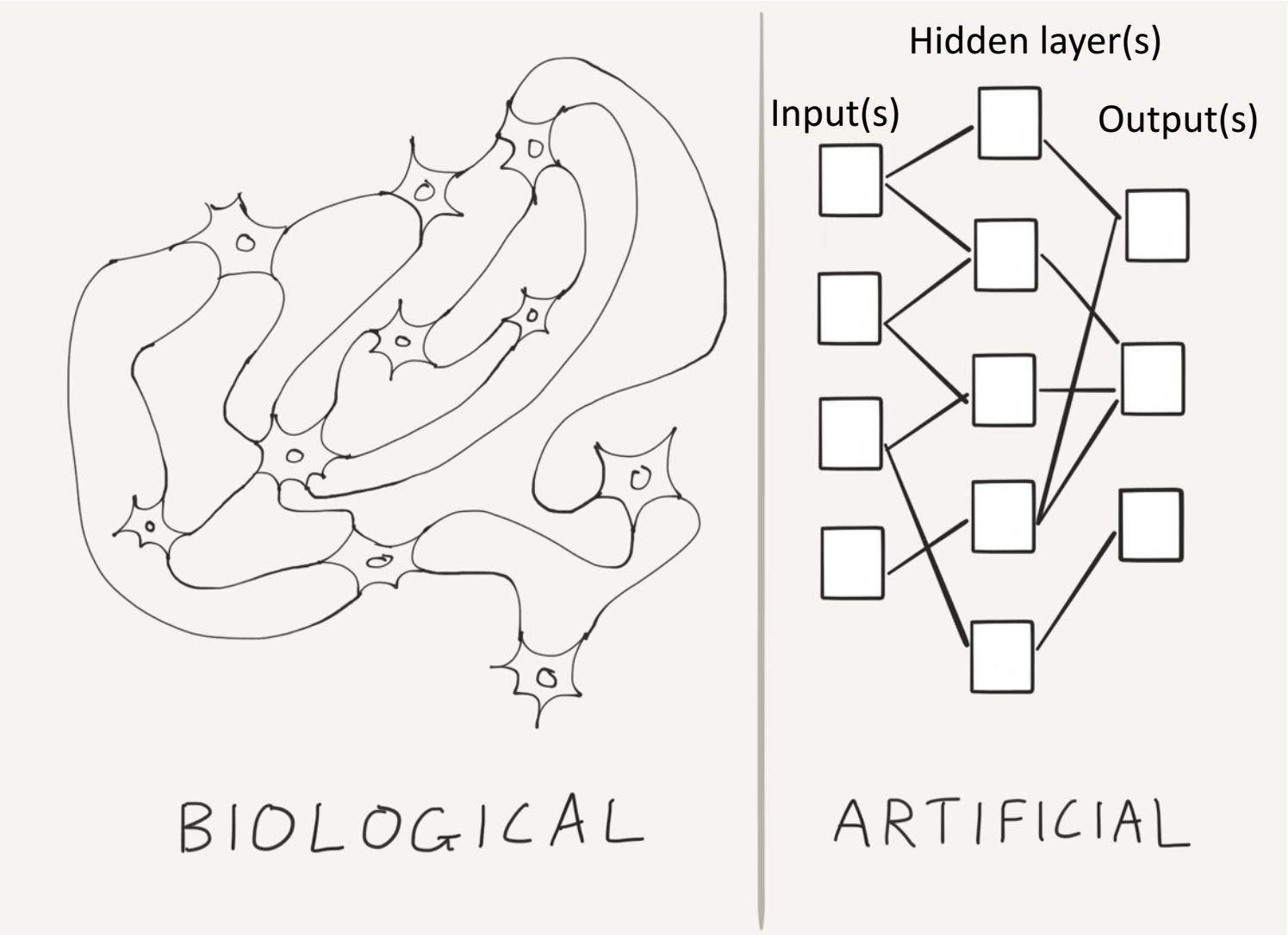


Is this a city or a beach?

1. Try to guess / recognize. Right or Wrong?
2. Correct: +1. Reward!
3. Incorrect: -1. Penalty!
4. Repeat and learn through many feedback loops.

➔ (The) **machine** (is) **learning**

Big Data and AIs



Artificial intelligence is the **simulation of human intelligence processes by computer systems, especially artificial neural networks (ANNs)** inspired by the biological neural networks that constitute animal brains, which can "learn" (i.e. progressively improve performance on) through iterations and feedback. **AIs are powered by algorithms that learn to automate parts or all of tasks, and the machines they power.** (It’s also what has not been invented yet).

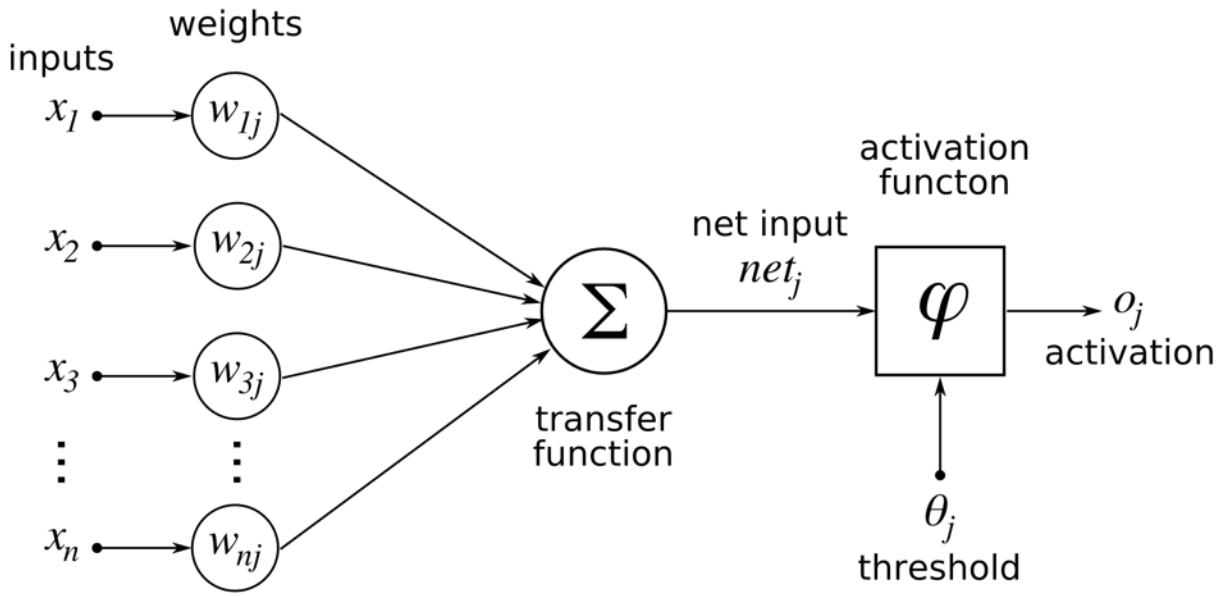
Is AI some new (black) magic? *No…but…*

No…

1. It is **at least 60+ years old**.
2. It still generalizes poorly. It has no sense of context. **It is still pretty stupid.**
3. We are **far from general AI**.
4. **Humans are still in control** (for better or worse)

…but…

1. The **(good) magic / core of the current AI is the credit assignment function to encourage and reinforce neurons / functions that help** the most achieve the goal (and reverse if not)
2. The key **difference and is data. Big Data.**



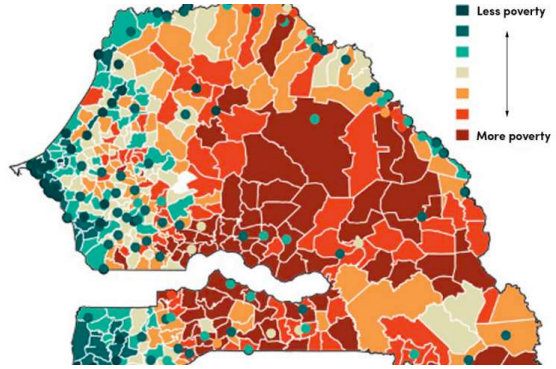
Some Early Applications

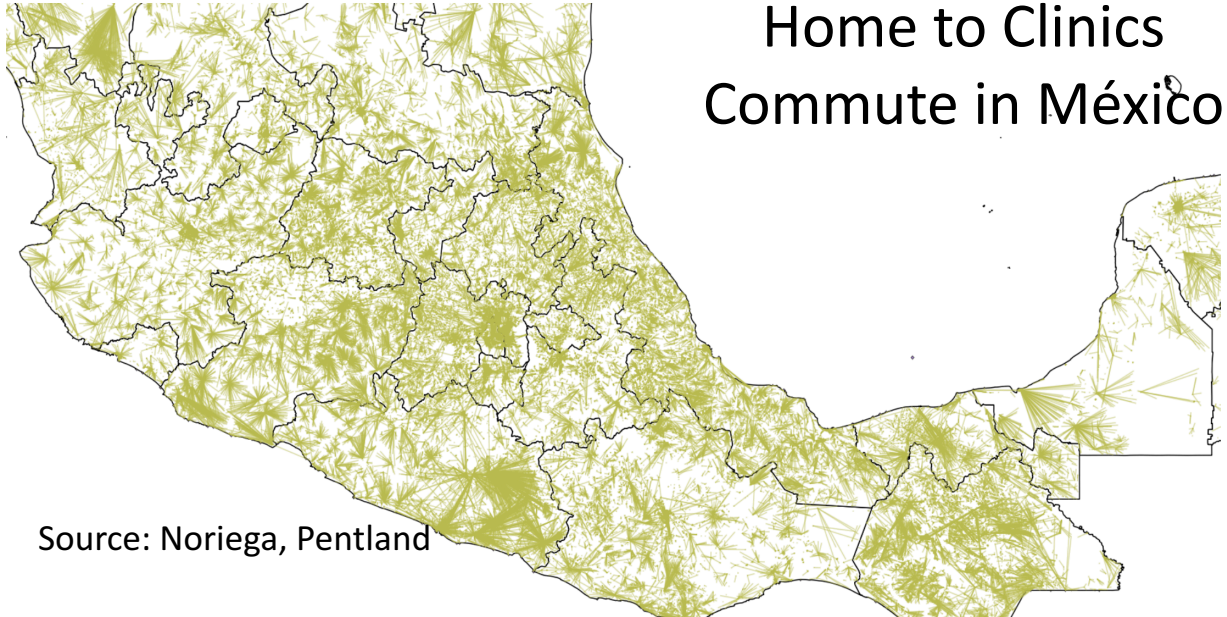
Scientific Prize and Ethics Mention: Construction of socio-demographic indicators with digital breadcrumbs

F. Bruckschen [1], T. Schmid [2], T. Zbiranski [1]

We show that socio-demographic indicators such as population, age, literacy, poverty, religion, ethnicity, electricity supply and others can be estimated in unprecedented detail and virtually ad-hoc using antenna to antenna traffic data only. We offer a uniform approach that can be easily extended to other variables. Results are tested for spatio-temporal robustness and visualized as heat maps.

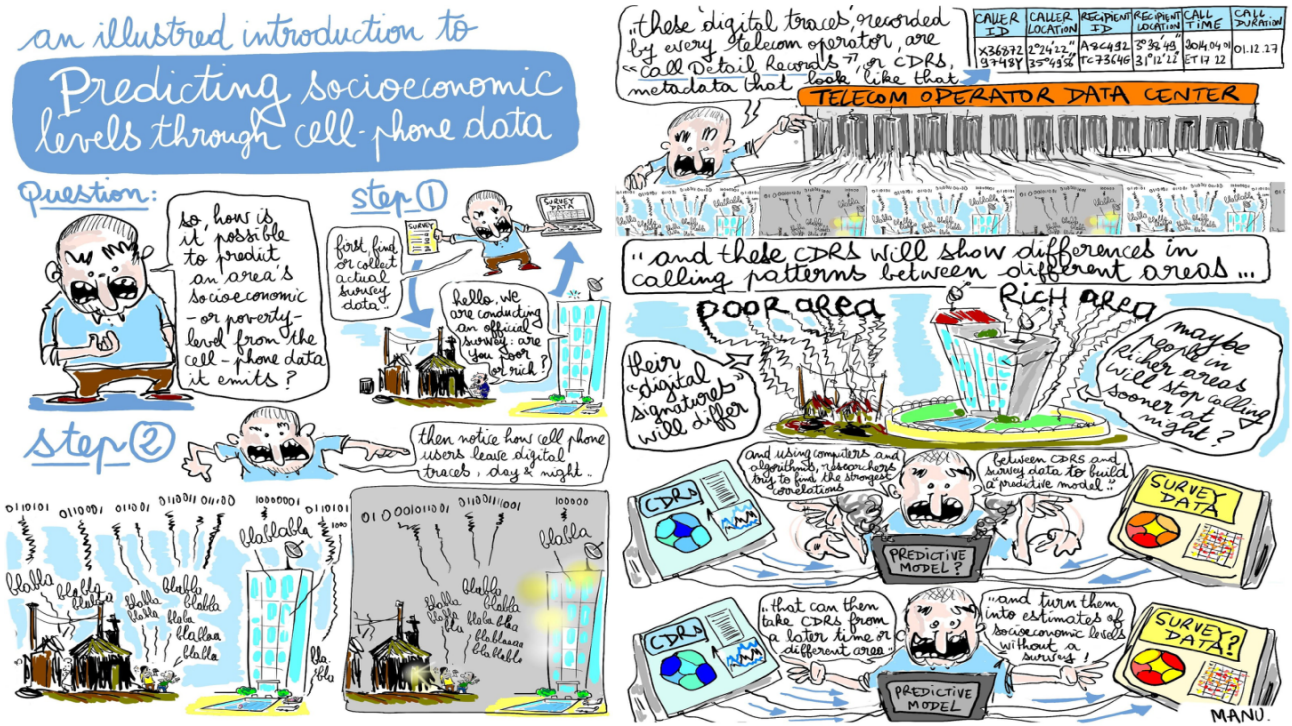
(1) Humboldt Universität Berlin, Germany - (2) Freie Universität Berlin, Germany



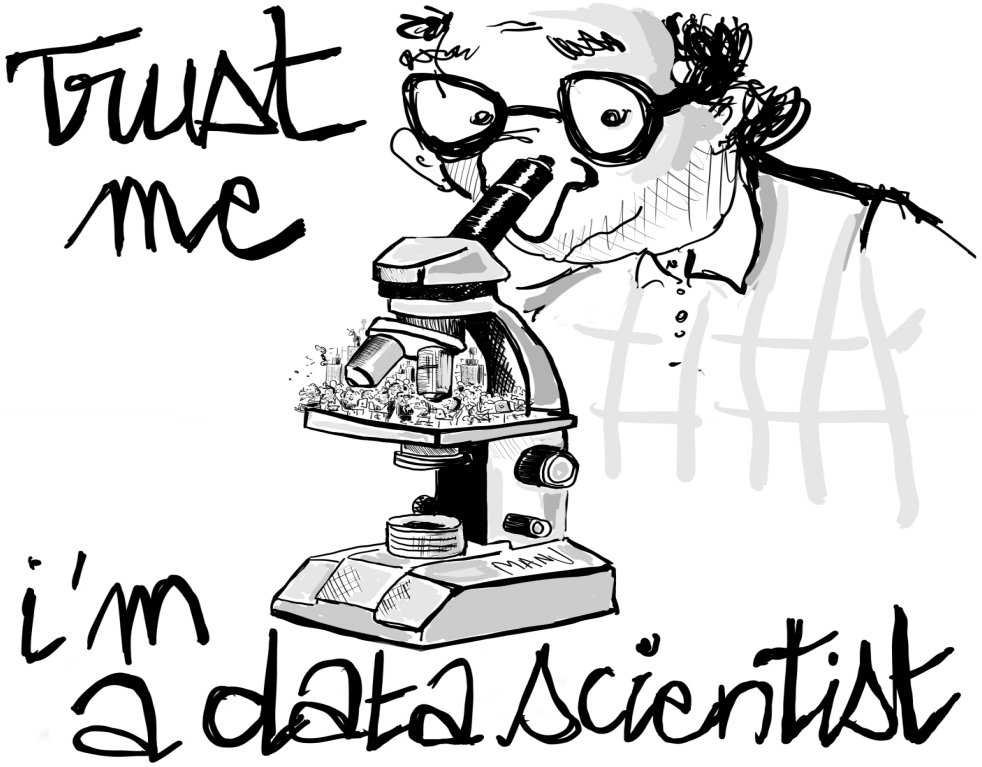


Home to Clinics
Commute in México

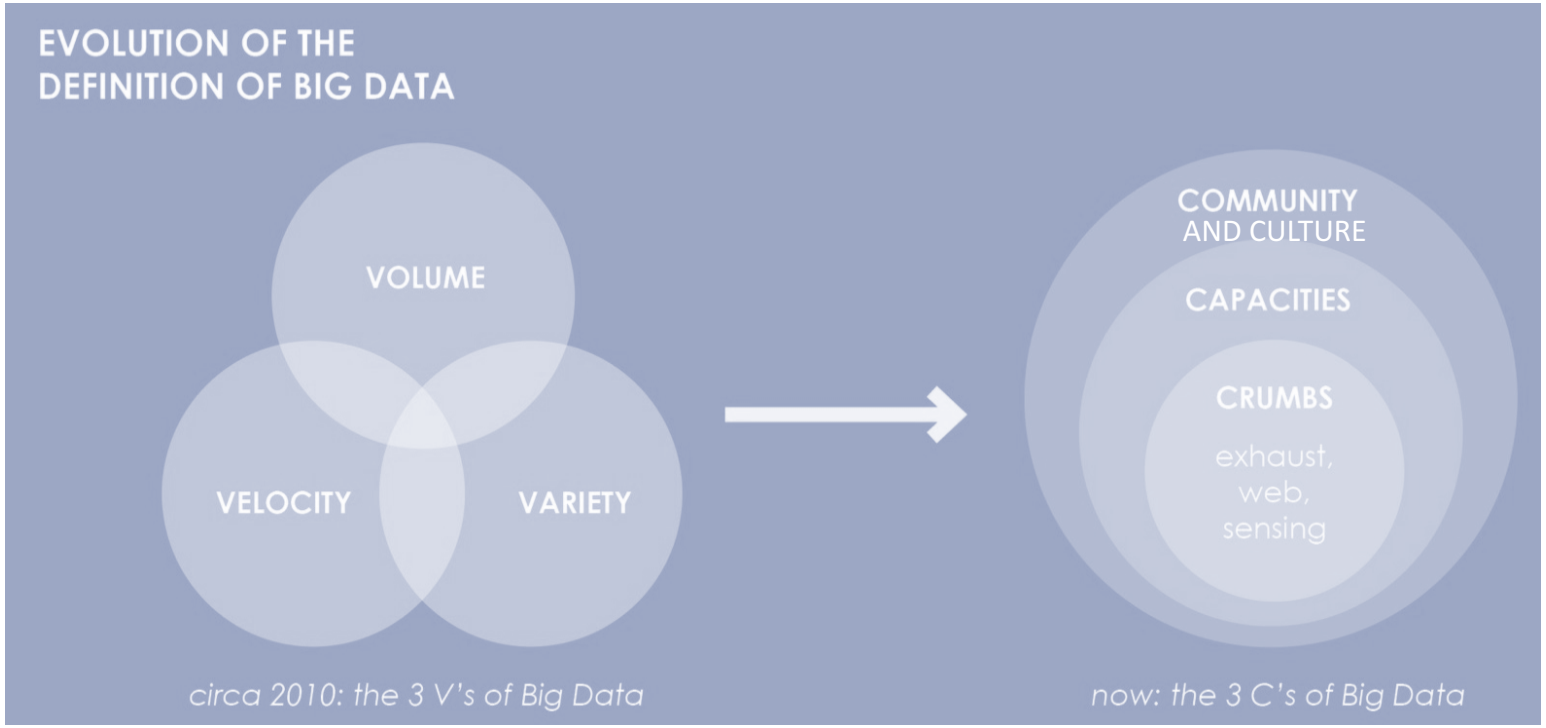
Source: Noriega, Pentland



But: Power, Politics, Privacy. Who Has Access to Data, How, to Do What? Next: Implications.



Source: Letouzé, 2013



Source: Letouzé, 2014

Big Long Term Vision: Towards “Human AI” ecologies

MIT Prof Alex ‘Sandy’ Pentland:

“The big question that I'm asking myself these days is ***how can we make a human artificial intelligence?*** *(…) I don't want to think small—people talk about robots and stuff—I want this to be global. (…) What would happen if you had* ***a network of people where you could reinforce the ones that were helping*** *and maybe discourage the ones that weren't?* ***That begins to sound like a society*** *or a company”.*

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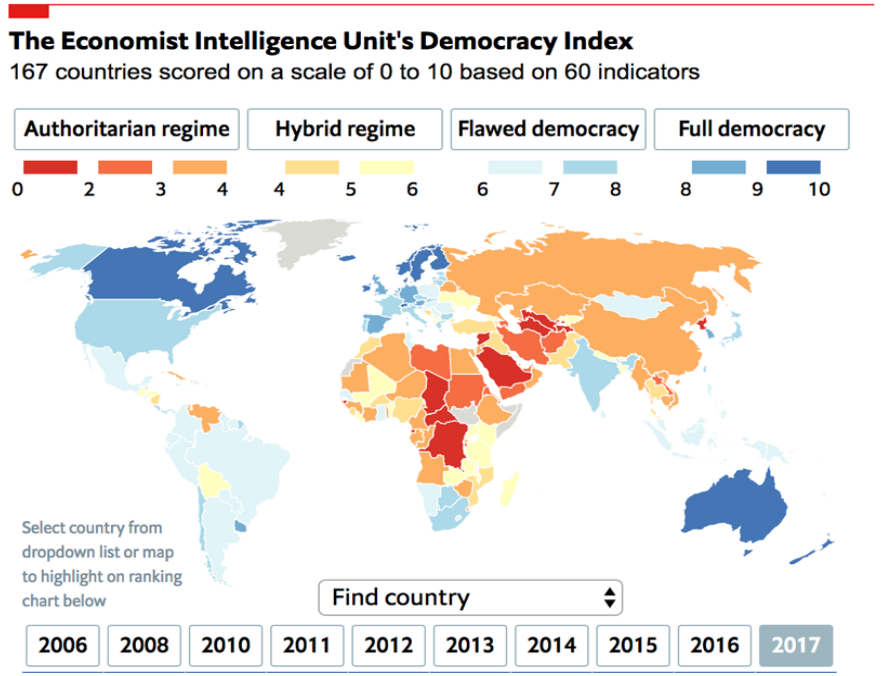
The Human Strategy. *www.thehumanstrategy.mit.edu*

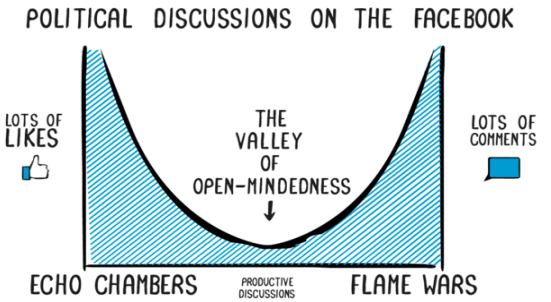
Vision of a "Human AI"

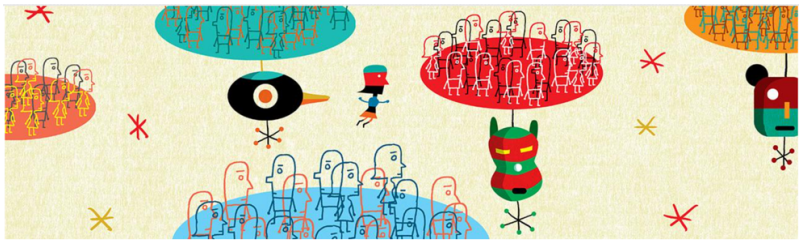
1. Key principle	2. Key features	3. Key requirements
Taking the **key insights of AI especially** • **role of data** • **credit assignment function reinforcing "neurons" that work** (teams, groups, policies) through learning **+ applying this general framework to entire societies**	Leveraging **human-machine complementarities**: • humans do the strategy and oversight and machines do the tactics and bookkeeping • Humans + Machines >> Humans or Machines • New jobs will be created (e.g. machine prison guards but more social workers) • Resulting ecologies are more agile and resilient	• Good **data** on the system's functioning and performance • Good **feedback and response systems** (i.e. *"human or society in the loop")* • Some general **agreement on inputs (facts) and outputs (goals)** • Sufficient **human skills and trust** to oversee, implement. learn, adapt, and again

Main Challenges to a Human AI

1. Some **powerful agents have strong incentives for this not to work** (e.g. economic and political monopolies benefit from status quo)
2. Most societies / countries currently **lack the appropriate data connections, capacities, and culture** for this
3. There is **widespread (and growing?) digital and analog segregation** with distrust, disdain, echo chambers, alternative facts narratives, hampering cooperation and consensus building
4. We know **AI can and has been used to nurture 3**. (cf Facebook newsfeed; Amazon Prime..)







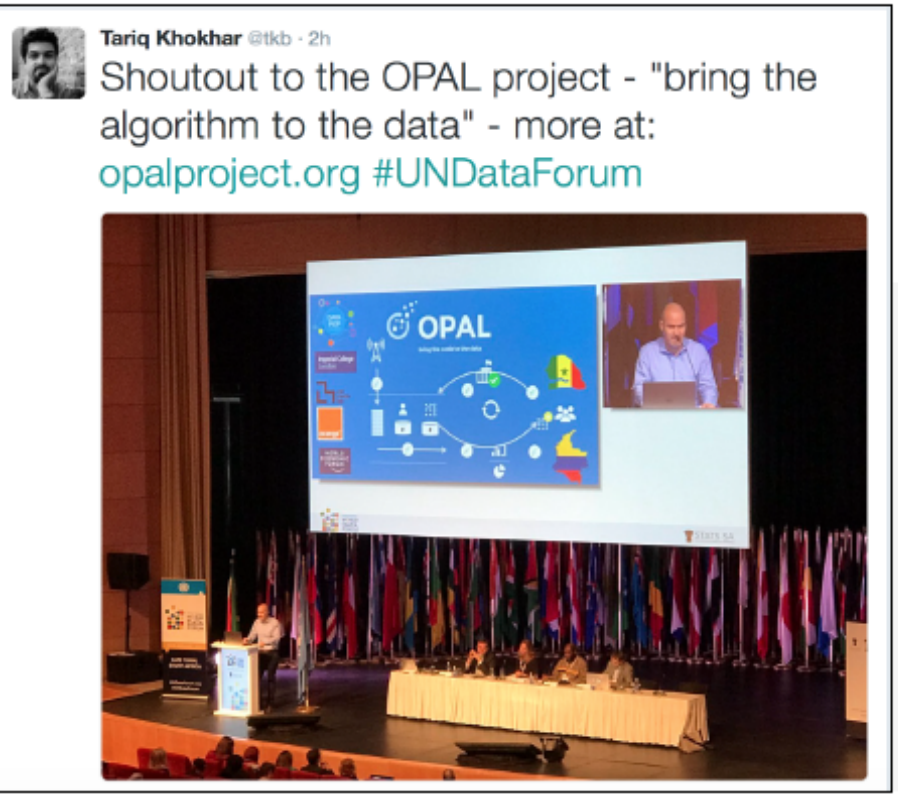
CULTURE | SOCIOLOGY

To Rescue Democracy, Go Outside

Real spaces, not digital ones, will fix our politics.

BY ALEX PENTLAND
ILLUSTRATION BY JAMES YANG
OCTOBER 13, 2016

“Open Algorithms”: A Bold New Vision and Project



Open algorithms: A new paradigm for using private data for social good

By Thomas Roca, Emmanuel Letouzé | 18 July 2016

The Open Algorithm project: Developing indicators, capacity and trust

To address the complex challenge of data access, Orange, MIT Media Lab, Data-Pop Alliance, Imperial College London and the World Economic Forum — supported by Agence Française de Développement and the World Bank — are developing a platform to unleash the power of “big data” held by private companies for public good in a privacy preserving, commercially sensible, stable, scalable and sustainable manner.

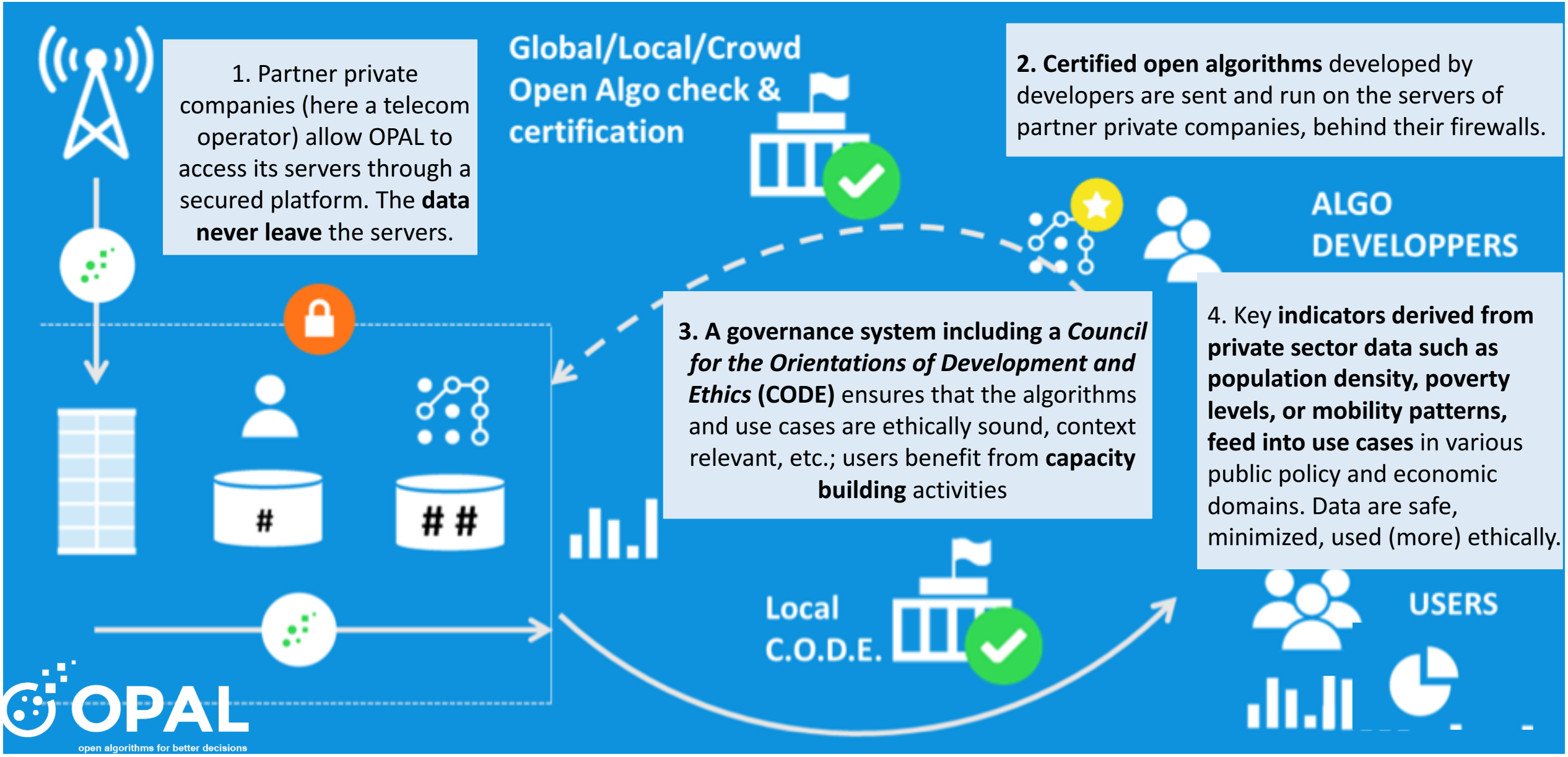
MONDE

Mettre le Big Data privé au service du bien public

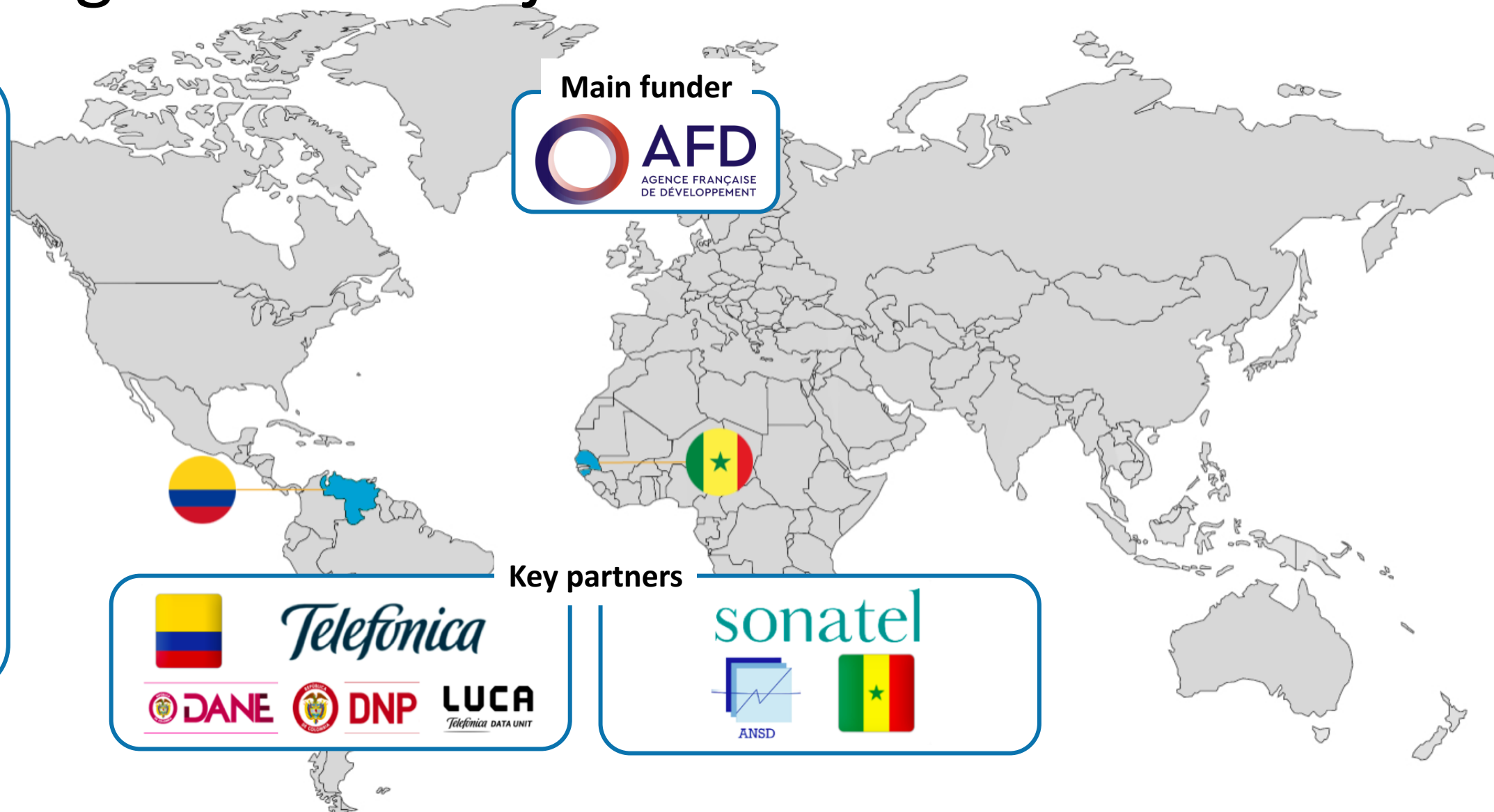
BENOÎT GEORGES - LES ECHOS | LE 06/12/2016

Le projet Open Algorithm vise à utiliser les données d'entreprises privées pour des actions de développement.

OPAL: 1st Generation Data Systems and Standards



OPAL Started with 2 pilots in Colombia and Senegal with 2 Major Telcos and their NSOs



Founders

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WORLD ECONOMIC FORUM

DATA-POP ALLIANCE

Main funder

AFD AGENCE FRANÇAISE DE DÉVELOPPEMENT

Key partners

Telefónica

DANE DNP LUCA Telefónica DATA UNIT

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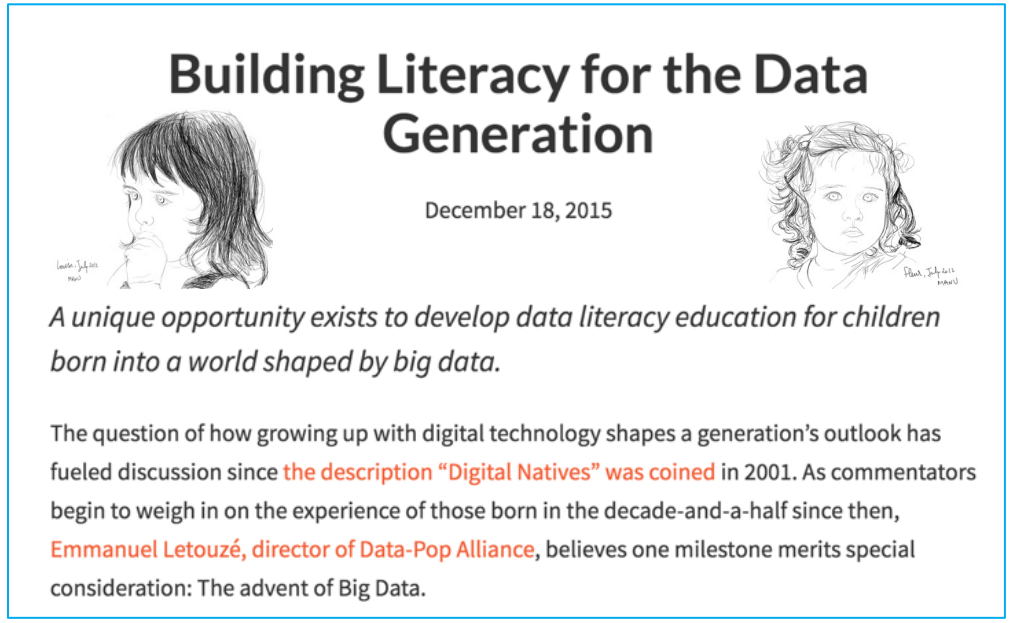
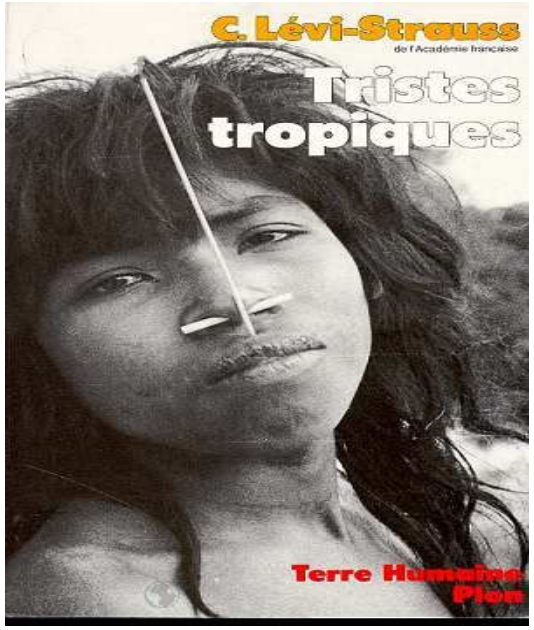
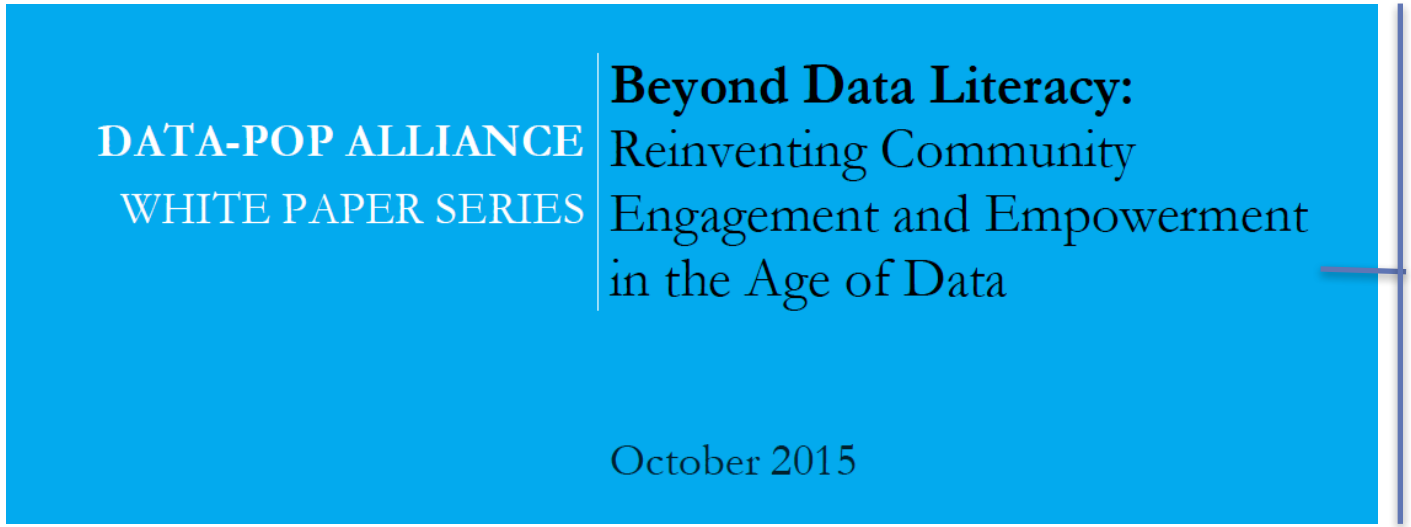
Key to all this: Building **Capacities and Connections**



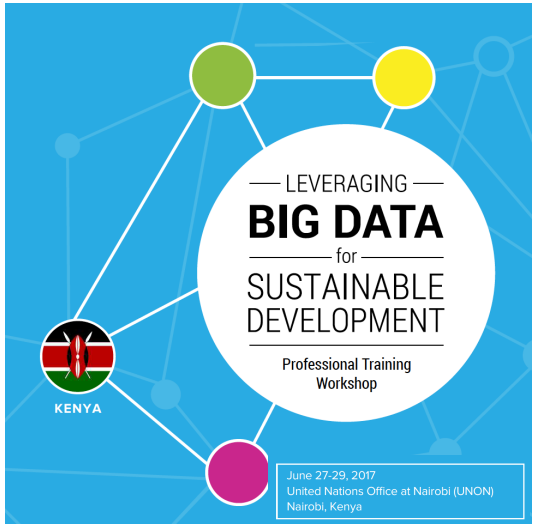


"***Writing is a strange thing***. *If my hypothesis is correct,* ***the primary function of writing, as a means of communication, is to facilitate the enslavement of other human beings***".

The fight against illiteracy goes on par with an increase in the control of the Power over citizens."



"We define data literacy as ***"literacy in the age of data",*** *i.e.* ***"the desire and ability to constructively engage in society through or about data"***.



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Thank you

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