Official Statistics 4.0

EMOS WEBINAR 6. JUNE 2018

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FACTS ARE
CONFUSING ME

Official Statistics

DEFINITION (IM)POSSIBLE

Three questions

Who?

- Official statistics are produced and provided by statistical offices, i.e. public administrations

What?

- Statistical programme and priorities are prepared according to public sector standards (i.e. participation of civil society) with the final decisions partly taken in legislative procedures

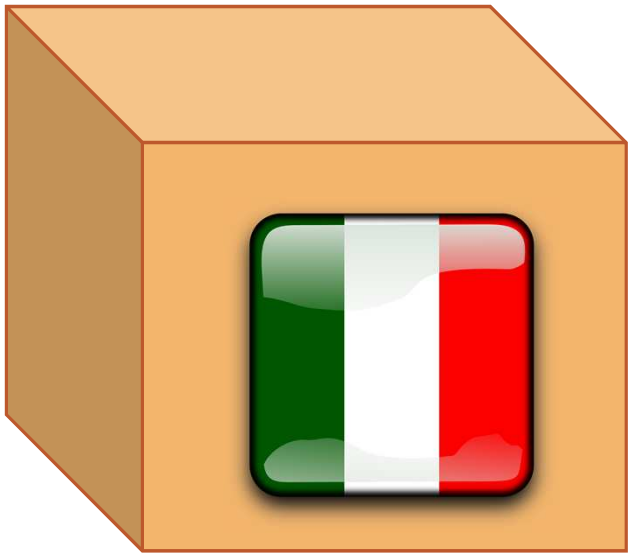
How?

- Statistical methodologies are nowadays subject of international cooperation and manifested in statistical standards; high level quality is assured through management systems and ethical codes.

National Statistics' Paradigm

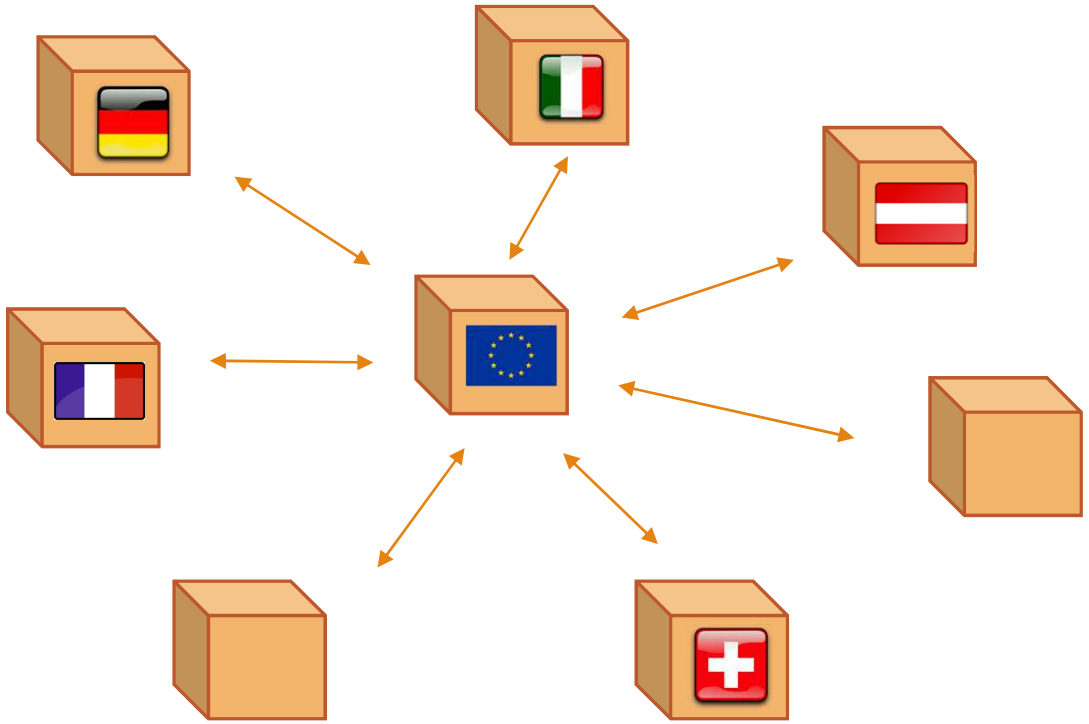
When? Year, Month

Where? Country, NUTS

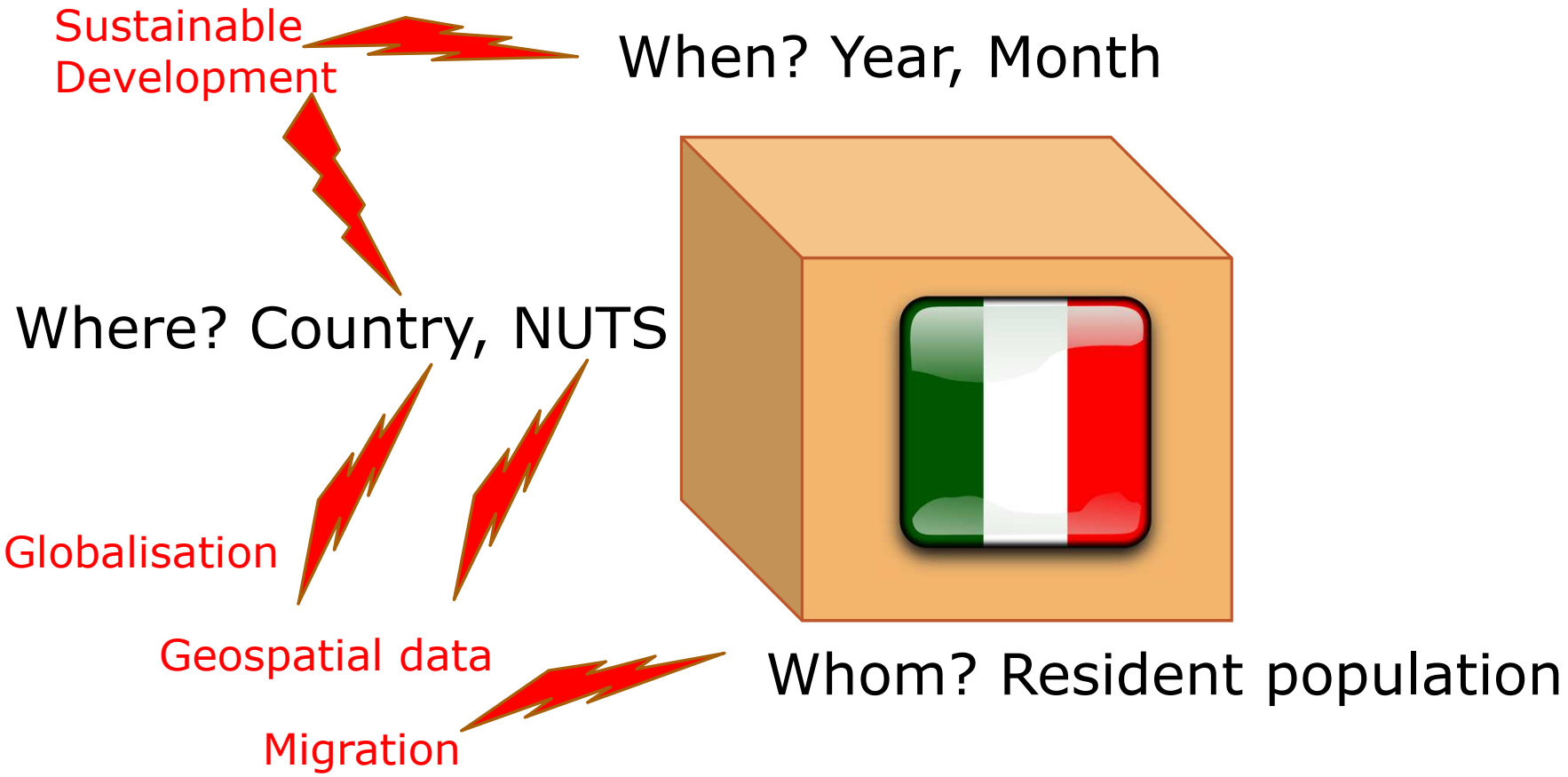


Whom? Resident population

European Statistics



Threats and Megathemes



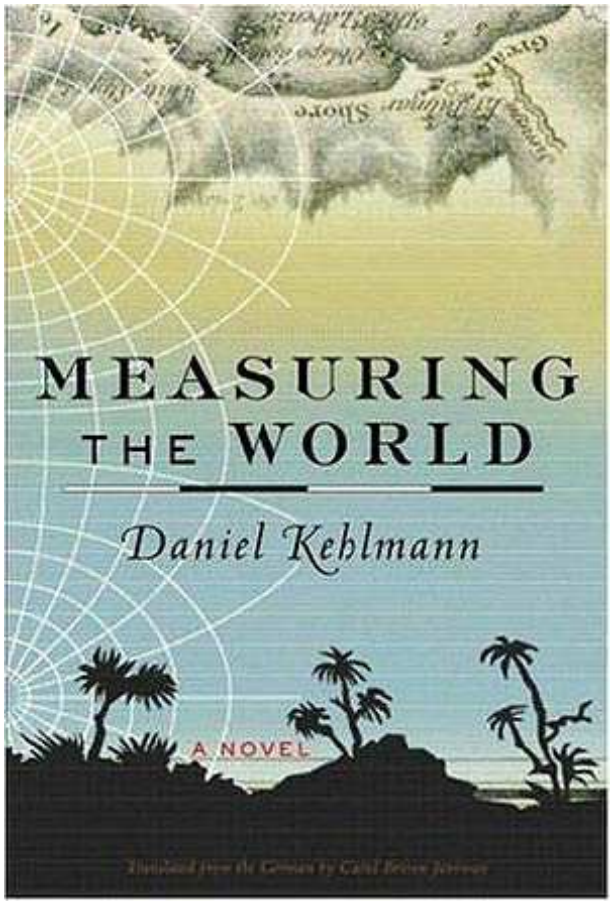
Epistemological basics

REALITY – DATA – MODEL – KNOWLEDGE - THEORY

Complementary approaches

Carl Friedrich Gauß

Alexander von Humboldt

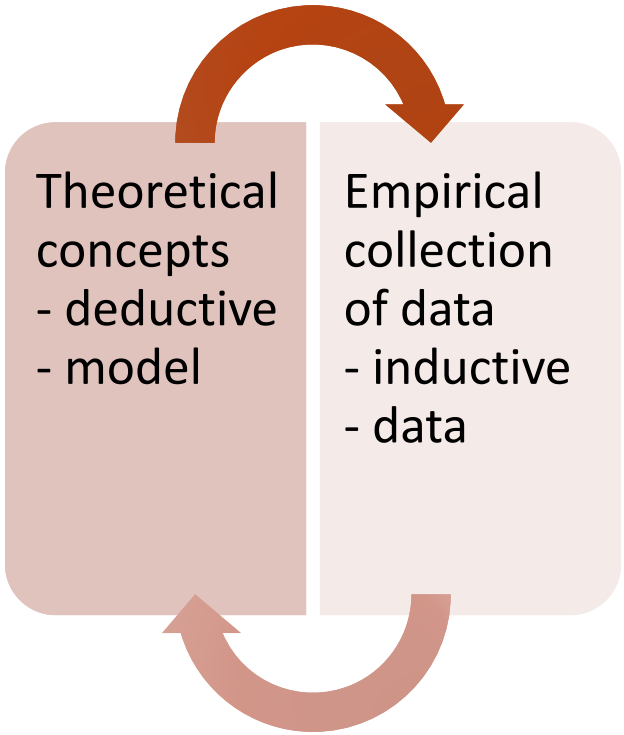



120°W
90°W
60°W
30°W
0°
30°N
0°
Equator
Bordeaux
Aug. 1st 1804
La Coruña
June 5th 1799
July 1804
Philadelphia May-July 1804
Washington
VI
United States
May 1804
Atlantic Ocean
New-Spain
Gulf of Mexico
Canary Islands
Santa Cruz June 1799
I
Havana
Trinidad Mar. 1801
Mexico-City
Mar. 1804
Veracruz
Acapulco
Mar. 22nd 1803
III
Dec. 1800
June-July 1799
Caracas
Cumaná
July 16th 1799
V
Cartagena
Angostura June-July 1800
Feb.-Mar. 1803
Bogotá July-Sep. 1801
New-Granada
II
S. Carlos May 1800
Quito Jan.-June 1802
Chimborazo
Guayaquil
Jan. 1803
IV
Pacific Ocean
Peru
Lima Oct.-Dec. 1802
Azimuthal equidistant projection
Alexander von Humboldt's American expedition 1799-1804
Expedition way
City / Stopping place
Spanish Viceroys and United States
I With the spanish corvette "Pizarro" from La Coruña over the Canary Islands to Cumaná
II 75-days journey with Bonpland, on the Orinoco and the Rio Negro
III With the ship from Nueva Barcelona to Havanna, 3-month sojourn on Cuba, over Trinidad to Cartagena
IV Through today's Colombia, Ecuador and Peru to Lima
V From Guayaquil to Acapulco, longer sojourn in Mexico-City and back to Havanna over Veracruz
VI With the cargo ship "Concepción" to Philadelphia, Washington, with the french Frigate "La Favorite" to Bordeaux

Complementary approaches

Carl Friedrich Gauß

Alexander von Humboldt

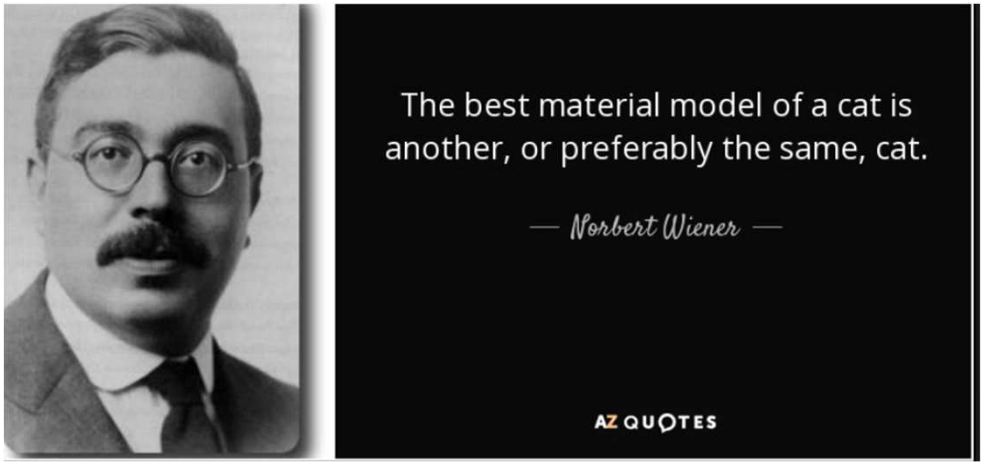


Measurement

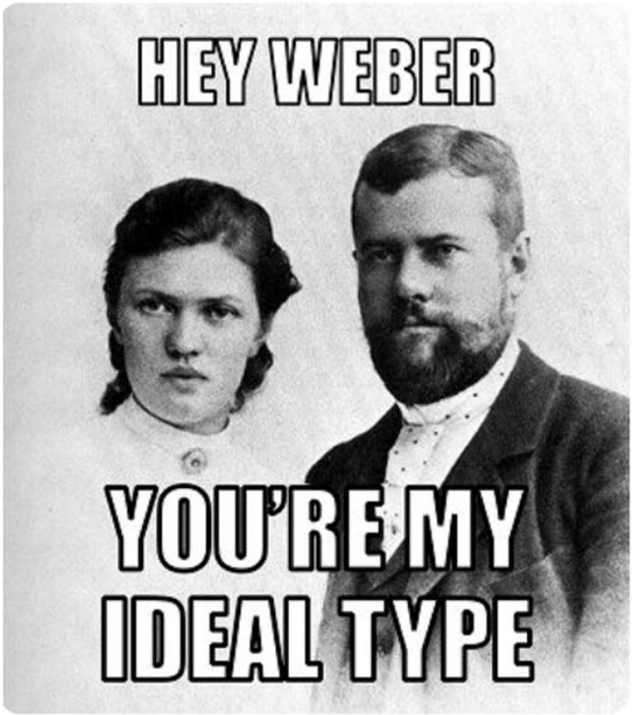
Measurement

Natural

Phenomena



Quantification

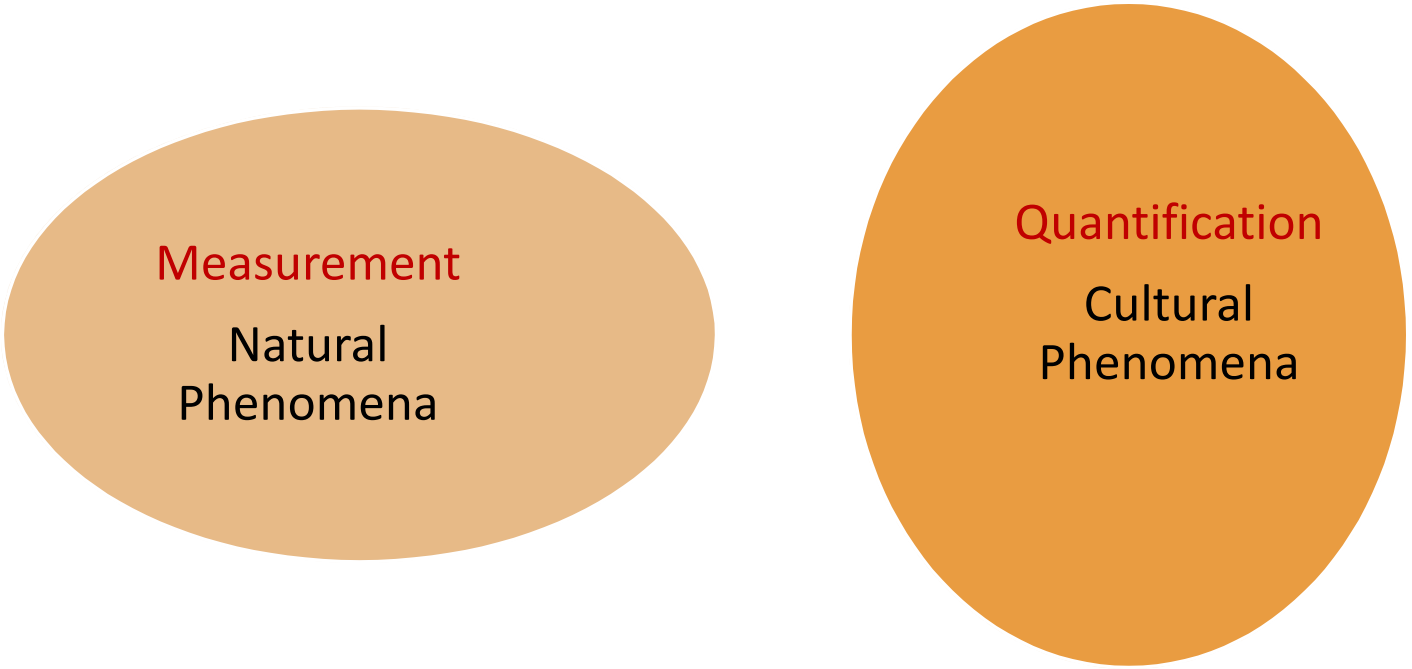


Quantification

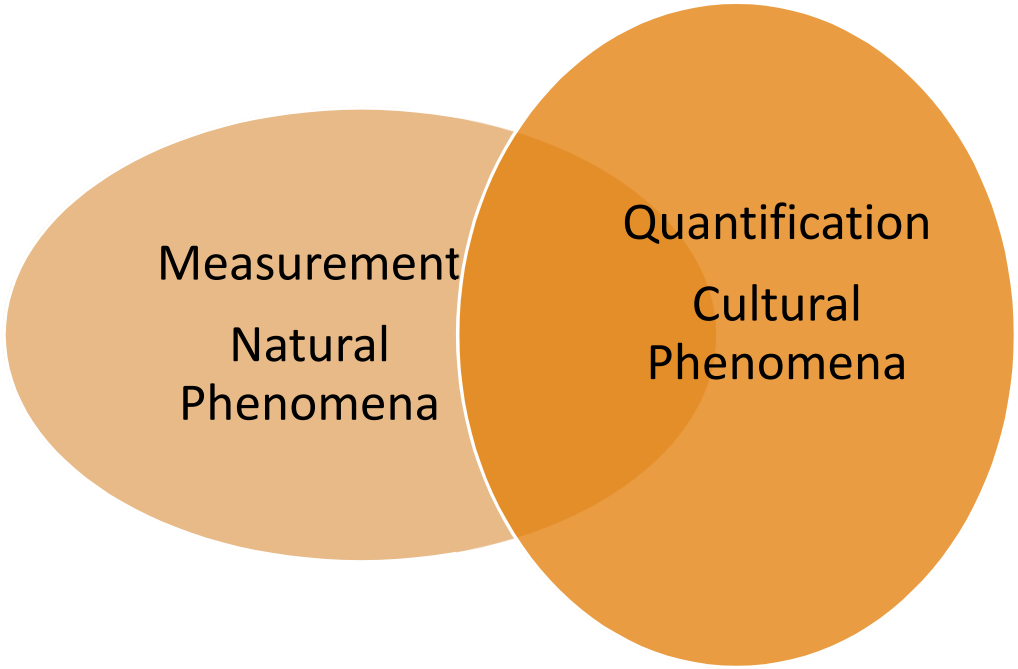
Cultural

Phenomena

Different objects



Different objects



Complexity (ex Alberto Peruzzi, 2017)

The recurrent idea of complexity as at the centre of a circle of so many topics that there will be "something for everyone" invites confusion. Its acceptance spells the end of logic, which if it does not immediately bring the end of science, certainly prepares the way.

Data don't tell us how to interpret them, and when more than one interpretation is at hand, it is the theory we adopt which makes the difference (p 3)

No property of an observed system S is independent of the observing system S' (p 11)

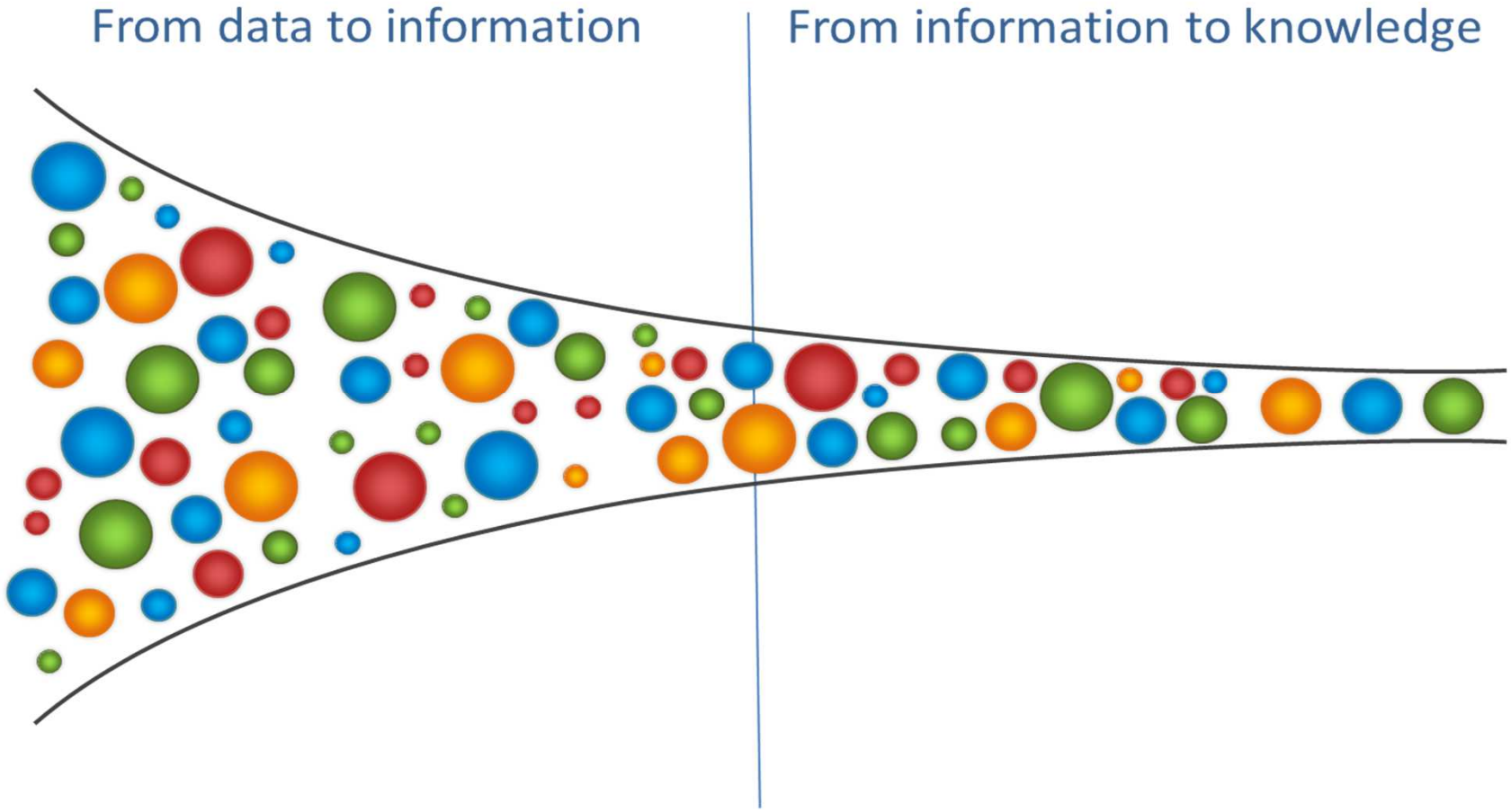
Axes in research on complexity (pg 12):

- *Co-evolution of a system and its environment*
- *Emergence of relatively stable systems through self-regulation*
- *Non-linearity*
- *Morphogenetic laws*
- *Sudden phase transitions,*
- *Attractors of different shape for different systems*

In social sciences, the subjective, or "epistemic", side of complexity is no less important than the objective, or "ontological", one (p 29)

Peruzzi, A.: Complexity: Between Rhethoric and Science. In: Maggino, F. (ed.) Complexity in Society: From Indicators Construction to their Synthesis. pp. 3-50. Springer International Publishing, (2017)

Reduction of complexity



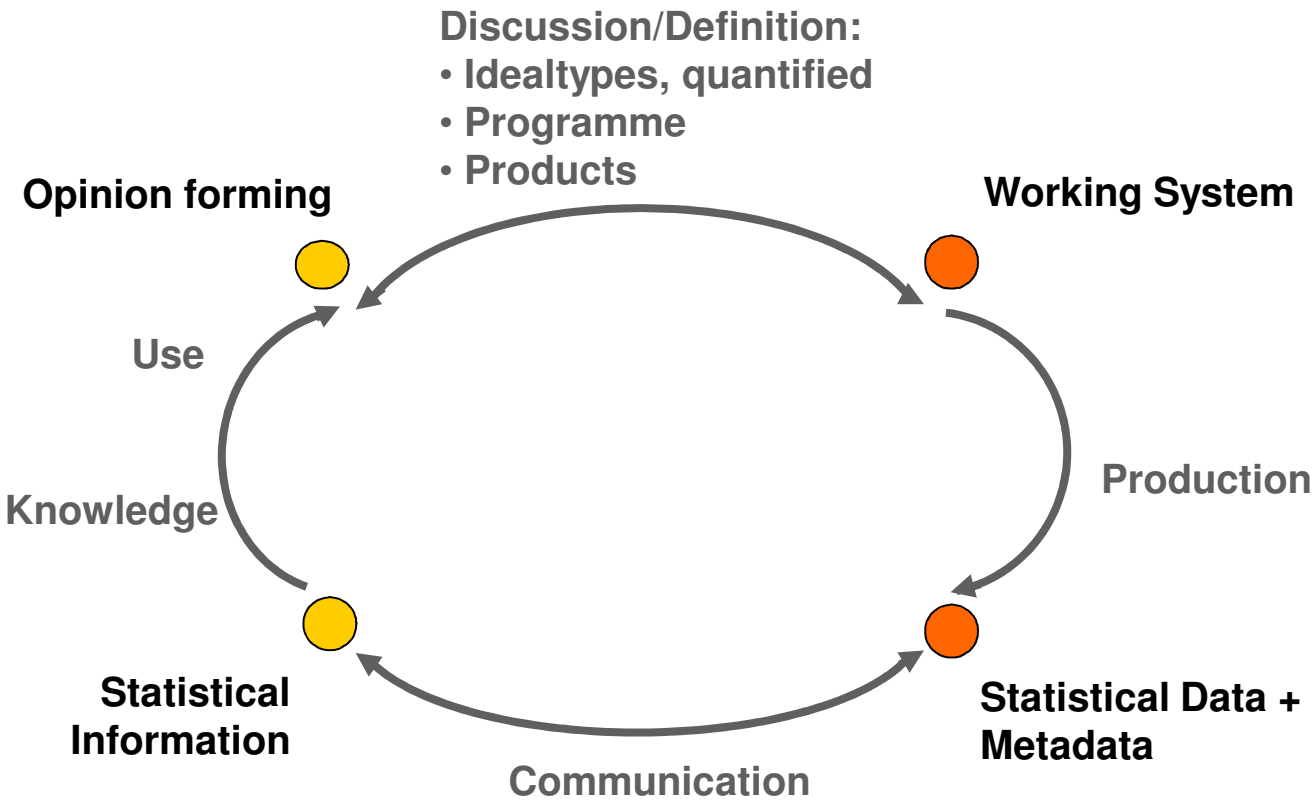
Quantifiable (in t) & limits

Official Statistics

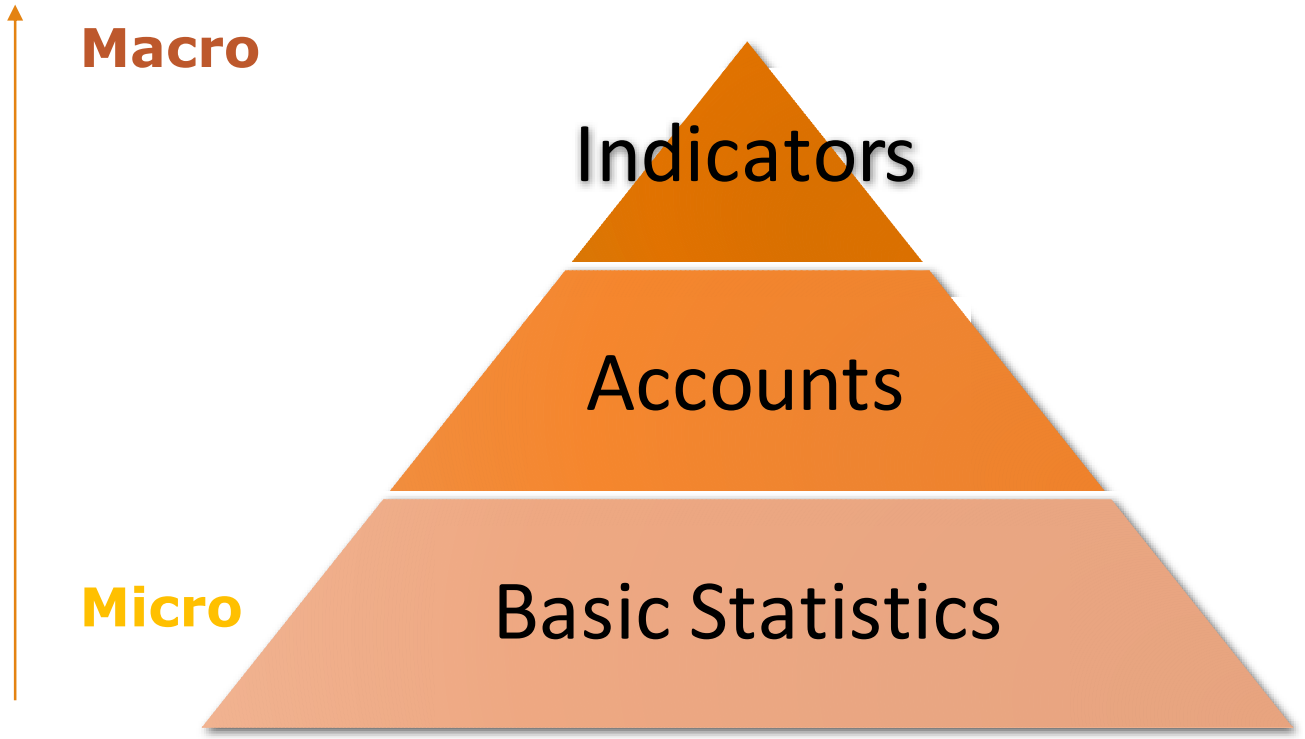
THE FACTORY

Statistical production process

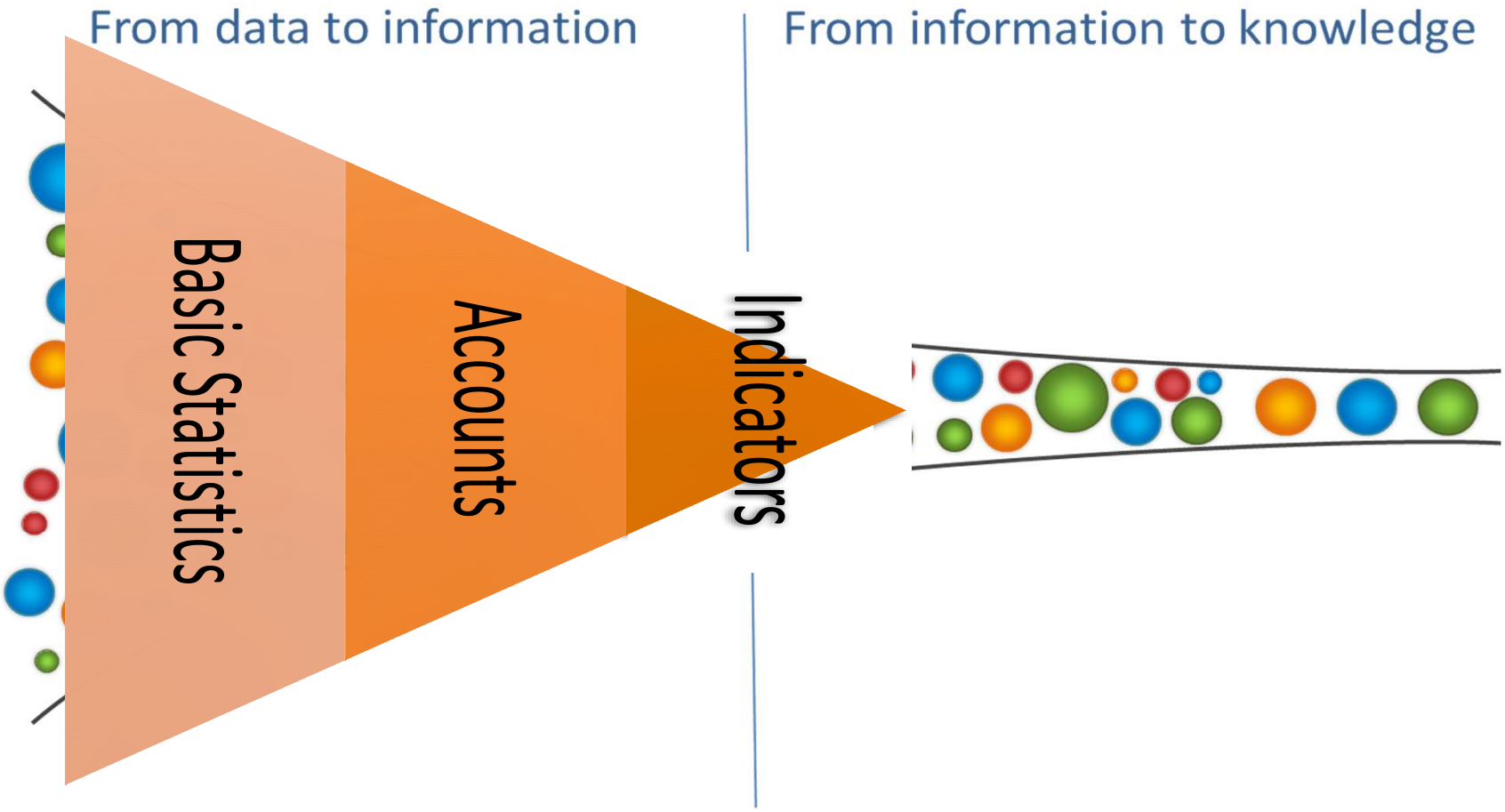
Users | **Producers**



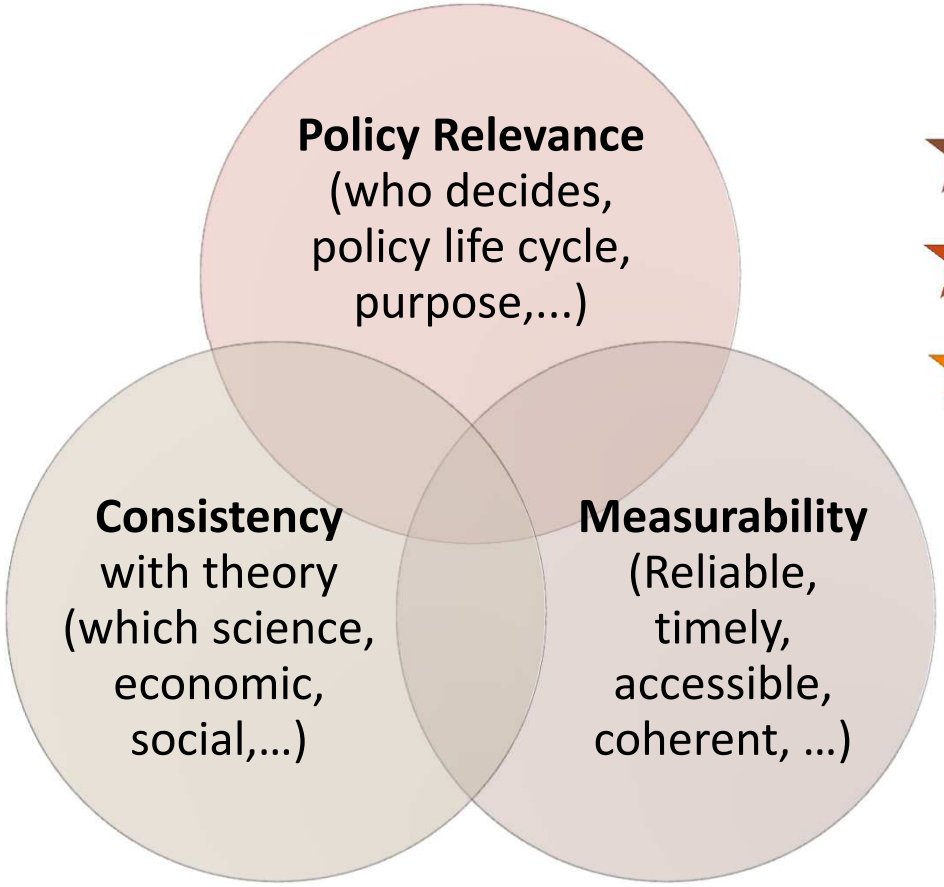
Information Pyramid



Information Pyramid



Quality = multidimensional

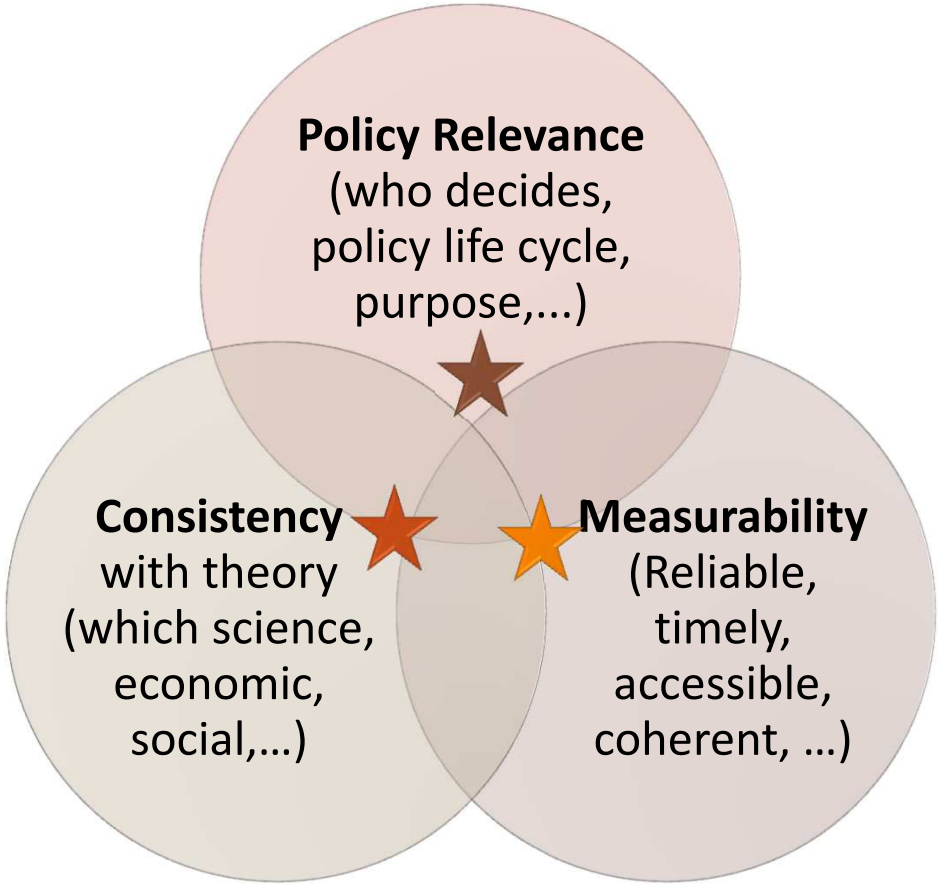


Indicators

Accounts

Basic Statistics

Quality = multidimensional



Indicators

Accounts

Basic Statistics

DNA of official statistics #1 Products

‘Manufacured’ products with basically 4 processes in their production lifecycle

- Design/development
- Production
- Communication/dissemination
- Use/application

Data is the raw material for these products (statistics equivalent to a refinery)

Products are elements in a larger portfolio

- Specific information types, complementary, altogether form a system
- Quality features and profiles differ, respond to specific purposes
- Quality cultures are different in statistical communities (producers and users)
  - surveys
  - admindata and register-based statistics
  - accounting
  - indicators

DNA #2 Evolution, Standards

The current production (products and portfolio) emerged from an interaction between users and producers (evolutionary process)

Public infrastructure for the democratic functioning of societies

- open data (free access, cost free, …)
- public good,
- tax financed

Measurement standards (similar to legislation) emerge from societal decision processes; stock of standards is a valuable asset

Important statistical standards (e.g. nomenclatures, national accounts, population censuses, indicator sets) based on international conventions

Statistical programme as well as many standards are subject of legislation, ensuring comparable quality

DNA #3 Quality

Statistics have the function of a language and boundary object

Quality is fitness for purpose

Quality of Statistics is depending on the

- Fitness of the model (quality of design)
- Quality of the production process (no errors, no deviation from design)
- Communication without misunderstandings and misinterpretations
- Conditions (money, skills, time etc.)
- Skills and datacy of the user

Branding / labelling (should) inform users in their language

DNA #4 Quality safeguards

Professional values and ethics

- Status Quo
  - Guidelines for professionals (ethics)
  - Guidelines for statistical institutions (good governance)
- Gaps
  - Segmentation of statistical products, risks
  - Design oriented ethics
  - Communication oriented ethics
  - Ethics for deciding makers and policy makers
  - Certification, branding, labelling

Governance and institutional safeguards in European statistics

- ESGAB
- Legal frameworks
- Peer Reviews
- Quality control, audit-like visits, sanctions

Stakeholders

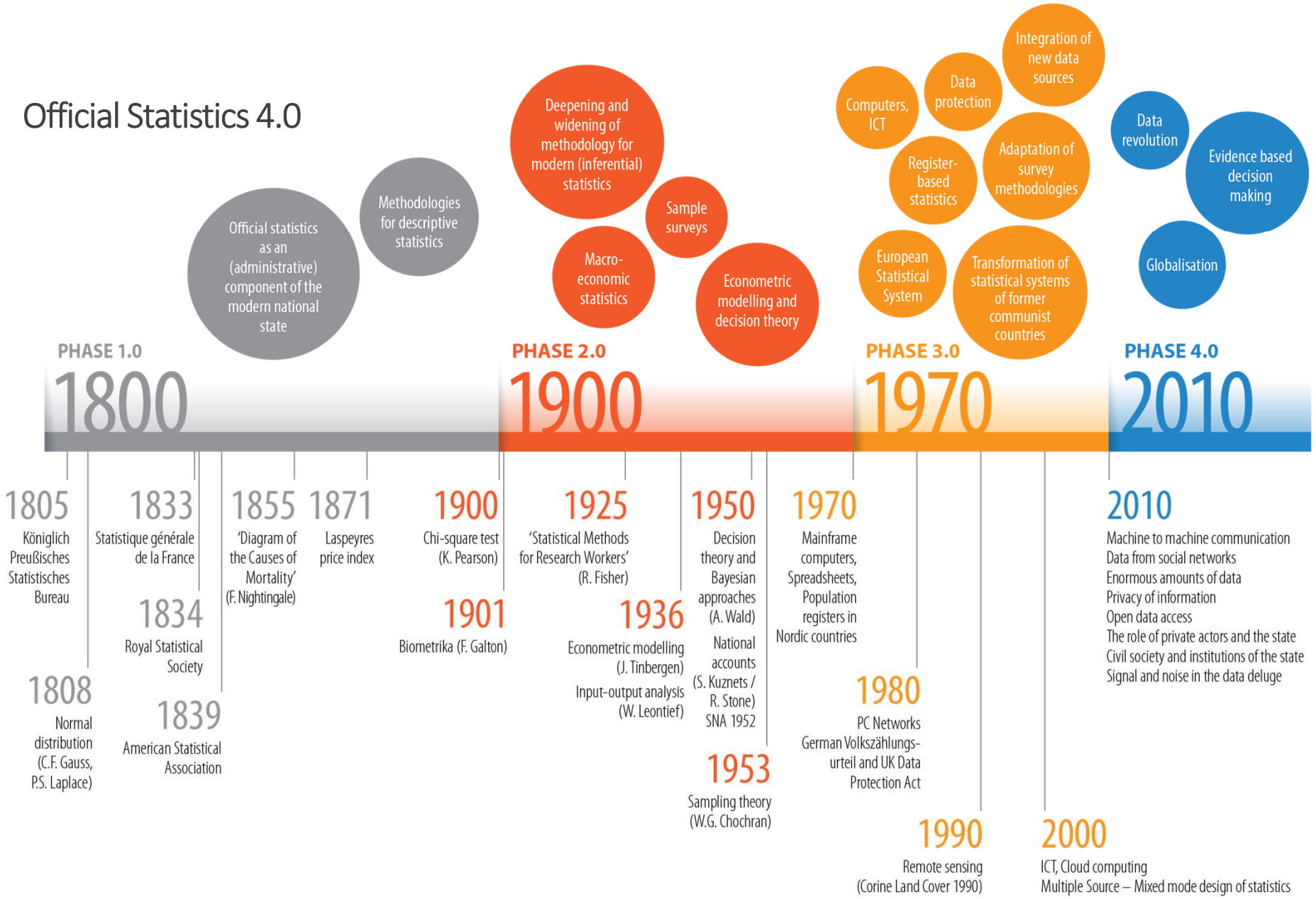
- Worldstat etc., participation of the civil society
- The role of science
- User consultation, new forms

Literacy

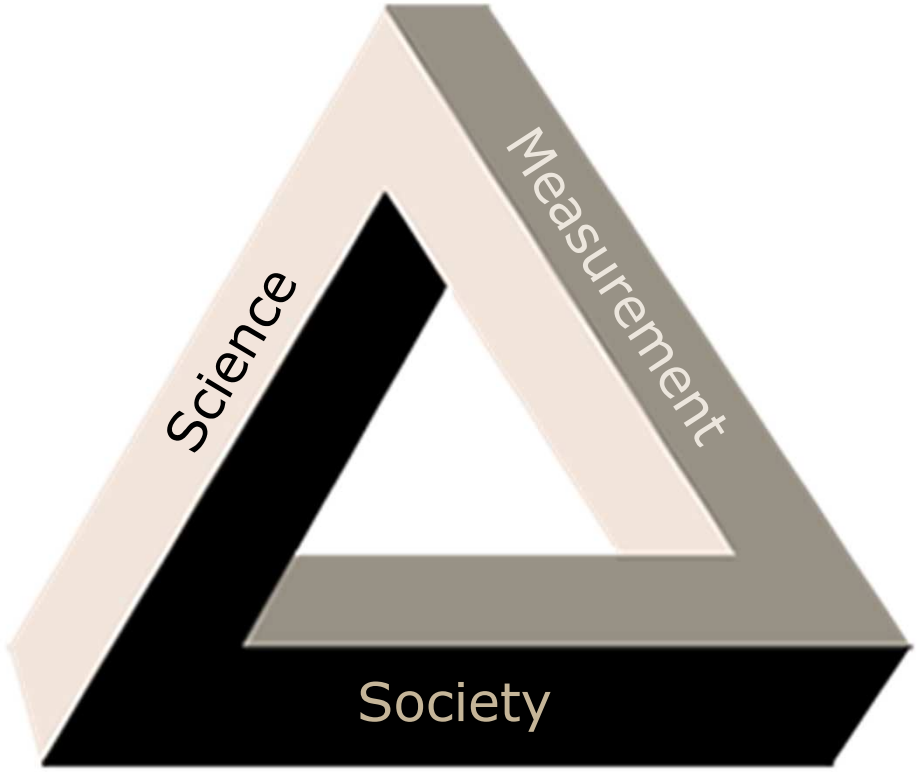
3Σ

SCIENCE, STATISTICS, SOCIETY

Official Statistics 4.0



Driving forces of change



The world we live in

Data revolution: "What steam was to the 19th century, and oil has been to the 20th, data is to the 21th." (http://www.rss.org.uk/Images/PDF/influencing-change/rss-data-manifesto-2014.pdf)

Evidence based decision making: "if you can't measure it, you can't manage it." (https://blog.deming.org/2015/08/myth-if-you-cant-measure-it-you-cant-manage-it/)

Post-truth-politics: "The 5% Unemployment Figure Is One Of The Biggest Hoaxes In Modern Politics." (https://www.youtube.com/watch?v=QMmk3oQ0QiI)

Evidence and decision making

Taking into account the consequences of a decision, together with their unintended feedbacks, was always recognised as an ingredient of rationality (Peruzzi: 4)

During the past hundred years or so, political governance underwent a massive “quantitative turn.” This quantitative turn is here understood as systematic effort to delineate and measure the objects and results of governance quantitatively for the purpose of demonstrating competitive edge and superiority at the individual and/or collective level. (Sangolt : 75)

A. Desrosières, Words and Numbers, in The mutual construction of statistics and society, New York, 2011 pg. 45

Table 2.1 The State, the Market, and Statistics

	Conceptualization of Society and of the Economy	Mode of Action	Forms of Statistics
Engineer State Production and people (since the seventeenth century)	Hierarchically structured institution, rationally organized France, from Colbert to De Gaulle; USSR.	Optimization under constraint. Reduction of costs. Planning. Technocracy. Major work projects. Long term vision.	Demography. Production in physical quantity. Input-output table. Material balance.
Liberal State Trade and prices (since the eighteenth century)	Physiocracy. An extensive market. Free competition	Fight against corporatism. Free-trade philosophy. Anti-trust laws protecting competition.	Statistics promoting market transparency: (e.g., American agriculture). Measurement of possible dominant position. Market shares.
Welfare State Waged work and its protection (since the end of the nineteenth century)	The labor market is not a market like any other, it has to be protected.	Laws on working hours, accidents, unemployment, and retirement benefits. Compulsory insurance systems ensuring social rights.	Labor statistics. Wage, employment, unemployment. Sampling surveys of workers' household budgets. Consumer price indexes.
Keynesian State Global demand and its components (since the 1940's)	The market cannot function on its own without generating crises. It must be regulated at a global level.	Supervising and managing the occasional gap between global supply and demand through monetary and budgetary policies.	National accounting. Analysis of the economic situation. Economic budgets.
Neoliberal State Polycentrism, incentives; Benchmarking (since the 1990's)	An extensive market. Free and undistorted competition Financialization Distributing the decision-making centers into a network.	Moving from rights to incentives: e.g., bonus-malus, polluting-rights market. Turning administrations into agencies. Contractualization Coordination by emulation: e.g., the European OMC	Objectification of new areas of equivalence Objectification of statistics. Construction and use of indicators to evaluate and classify performance. Benchmarking supplements, or replaces, directives and regulations.

Caution: knowledge is power!

- Statistics: sometimes a sort of unease
- Ideology: *"you can't manage what you can't measure!"*
- Data deluge: 28% risk of rain at 10am
- Objectivity: subjective assessments (seems) unacceptable!
- Determinism: appetite for certainty

What can go wrong with 'evidence based decision making' ?

Interaction between statistical indicators and public policies: possible stress!

Goodhart's Law

"When a measure becomes a target, it ceases to be a good measure"

Limitations in communication

Innumeracy, statistical literacy, data literacy

Wrong expectations

No appetite for quality food

Using heuristics, expecting precise measurement

Scientific overkill

Naïvety, blind faith

Cleverness, political pressure

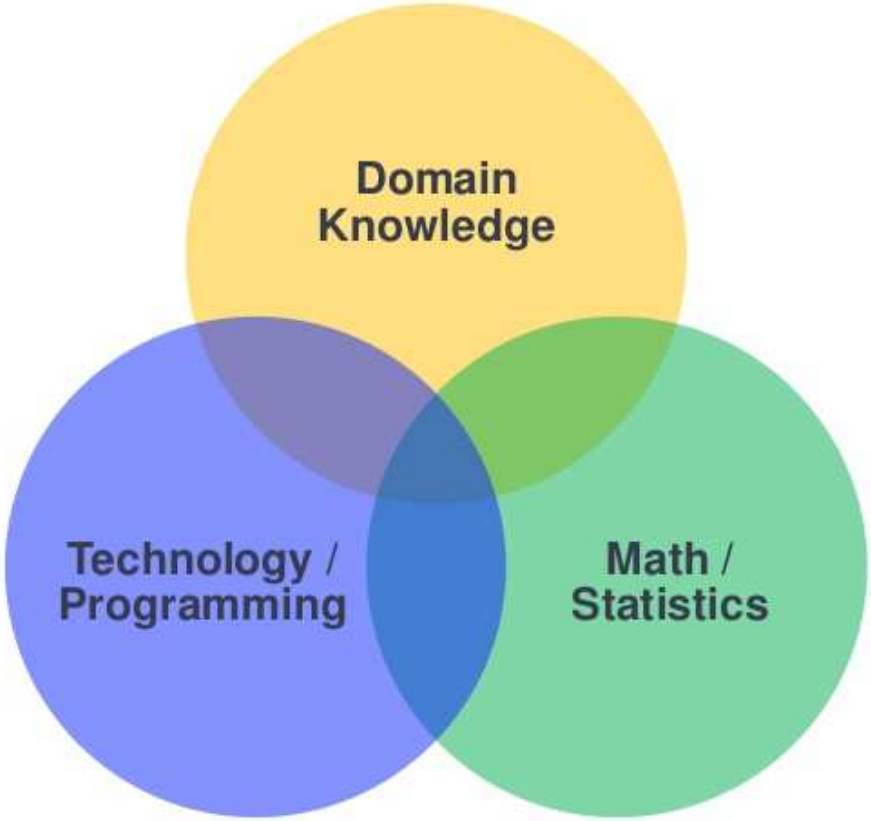
Promoting statistical literacy

http://memespp.com/homer-gdp-meme-generator-gdp-what-is-gdp-ea675c-jpg-1327467092-jpg/assets.diylol.com*hfs*d39*9e2*f7e*resized*homer-gdp-meme-generator-gdp-what-is-gdp-ea675c.jpg1327467092.jpg/diylol.com*memegenerator*homergdp2*memes*gdpwhatisgdp3/

Digital Age

WHAT IS IMPORTANT?

Three Skill Domains of Data Science

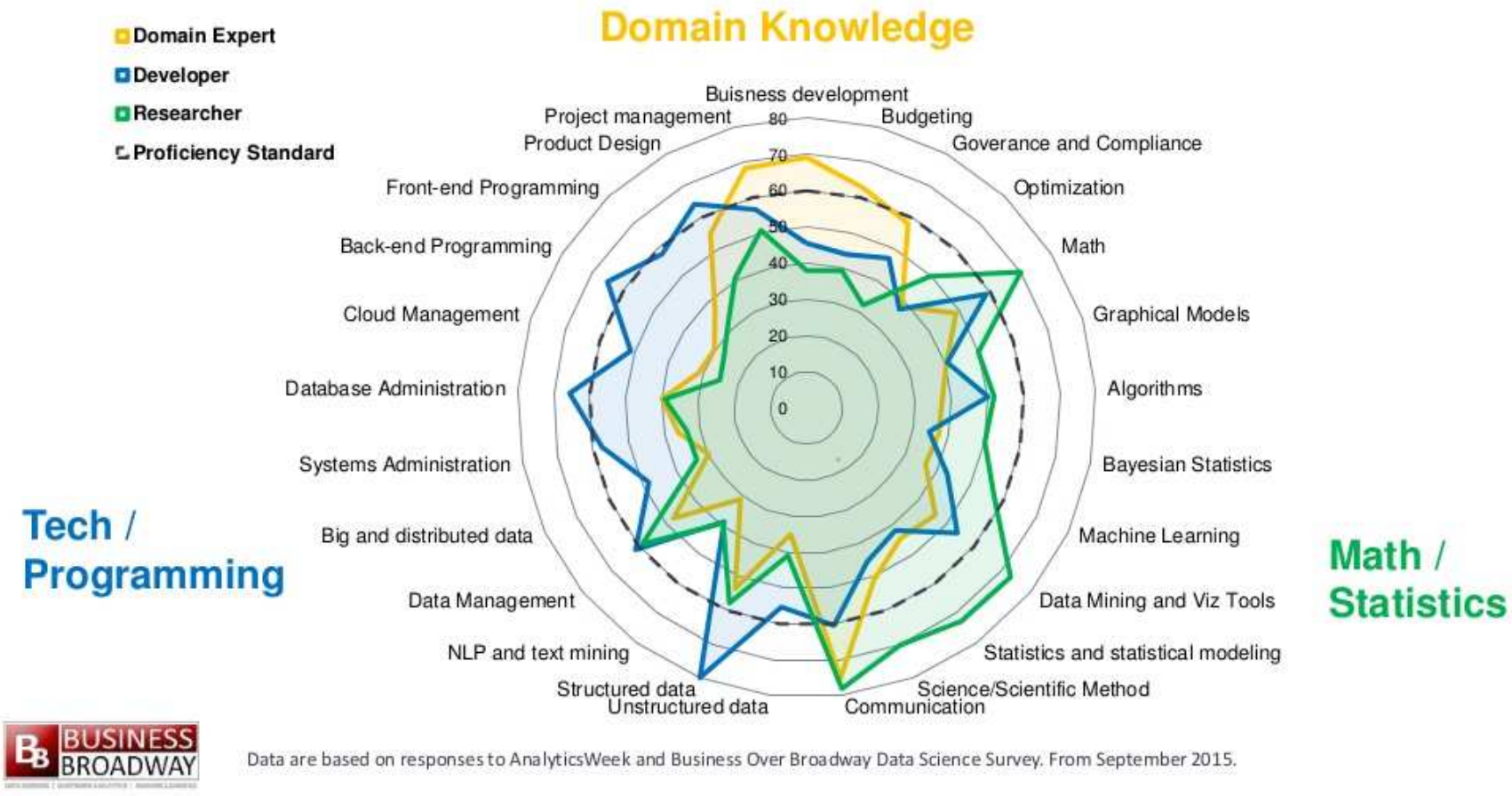


BUSINESS BROADWAY

9

Hayes, B.E.: The Practice of Data Science: People, Processes and Tools. Paper presented at the Metis' Demystifying Data Science: A FREE Online Conference for Aspiring Data Scientists, Online, 27. September 2017 https://de.slideshare.net/bobehayes/the-practice-of-data-science-demystifying-data-science-conference

Skill Proficiency Varies by Data Science Role



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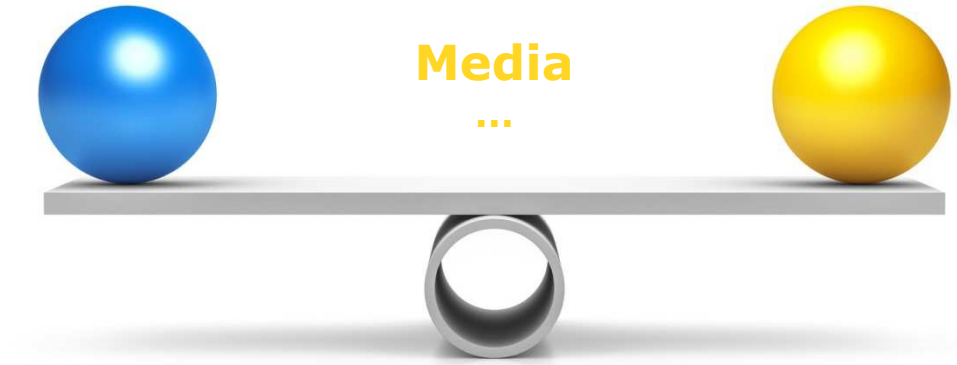
Beyond processes

3Σ STRATEGY FOR A DISRUPTIVE ERA

Information @ Society

Citizens
making choices,
when consuming and when voting
being politically active,
…

Policy
defining goals & targets
financing implementation
accountability
…



Media
…

Information
from data to knowledge
…

Official statistics 4.0 /society

Misunderstanding the real meaning of indicators by a society with a poor level of statistical literacy

- can create a wrong state of opinion,
- so misleading the voters or
- compelling politicians to take non-optimal measures

Dominance of technocrats (measurement mandarins) versus dominance of demagogues/ politicians; risk factors:

- High aggregated artefacts (e.g. GDP)
- Ex ante / top down classifications not in touch with identity of individuals
- Distance of national policies to individuals
- In times of Big Data: a data logic replaces a statistical logic
- Post-truth, alternative facts, 'there are no facts!!??'

Official Statistics: to protect!

Policy relevant – not politically driven!

Public infrastructure / public institution / public service with sufficiently guaranteed independence, adapted to the cultural and constitutional settings (other cases are courts, audit authorities, central banks, public media)

Final authority concerning statistical results (e.g. classifications); underlying control mechanisms (courts, audit) concerning procedures (legality, efficiency etc.)

Value for taxpayer's money: Output of statistical program is financed/budgeted - choice of the method / inputs in responsibility of statistical authority

Principles
A New Enlightenment

Statistics is a key for people empowerment

- Statisticians should be aware of the power of data which lies in their transformation of information services for knowledge

Open data are fundamental for open societies

- Statisticians should ensure open and transparent access to data and metadata and measure their actual use for information and knowledge

Datacy is a key enabler for citizens

- Statisticians should proactively invest in datacy capabilities in society at large and measure the results of statistical literacy

The future is smart statistics

- Statisticians should continue to invest in methods and algorithms that enhance the quality of data for statistical services tailored to users' needs

More influence means more responsibilities

- It is a duty of statisticians to explore the link between statistics, science and society and lead intellectual reflections on the possible risk of reliance on data-centrism

Products/Program 4.0

ADDRESSING THE MEGA-THEMES

Reviewing National Statistics' Paradigm

Globalisation

- Macro-economic indicator sets for different purposes, TIVA etc.
- Integration of ‘services’ in production and trade statistics
- European / international business registers
- Profiling for large entities and enterprise groups
- Exchange of micro-data

Sustainable development

- Here, elsewhere, tomorrow
- Mainstreaming SD in the information pyramid (more than a list of indicators)
- Integration of geospatial data

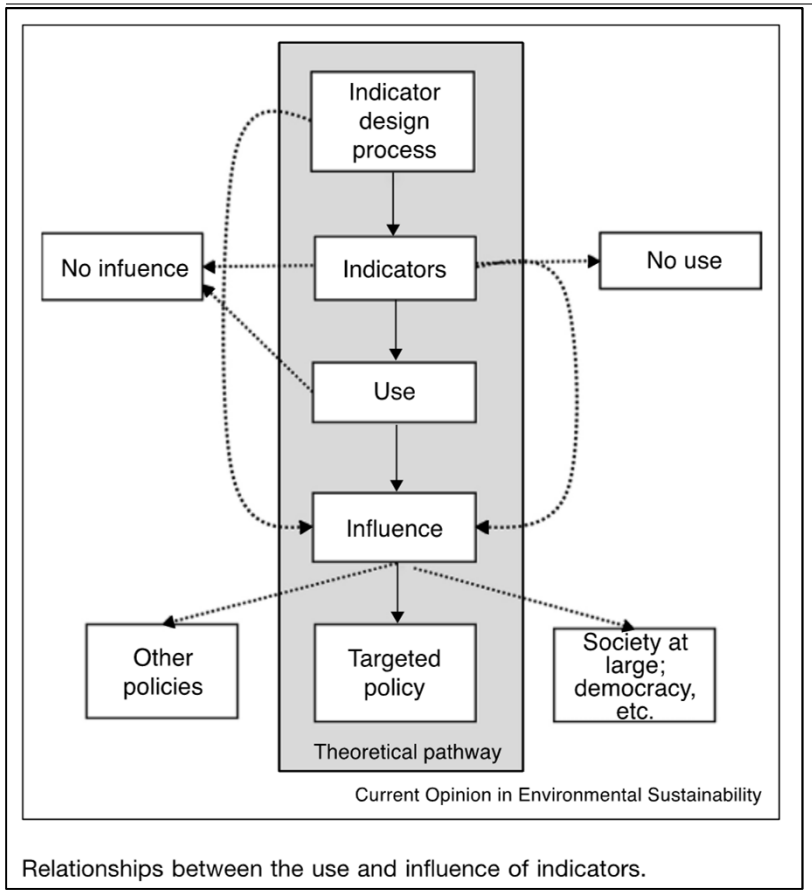
Migration

- Exchange of micro-data

Communication 4.0

MAINSTREAMING STAKEHOLDERS' INTERESTS

A market research view

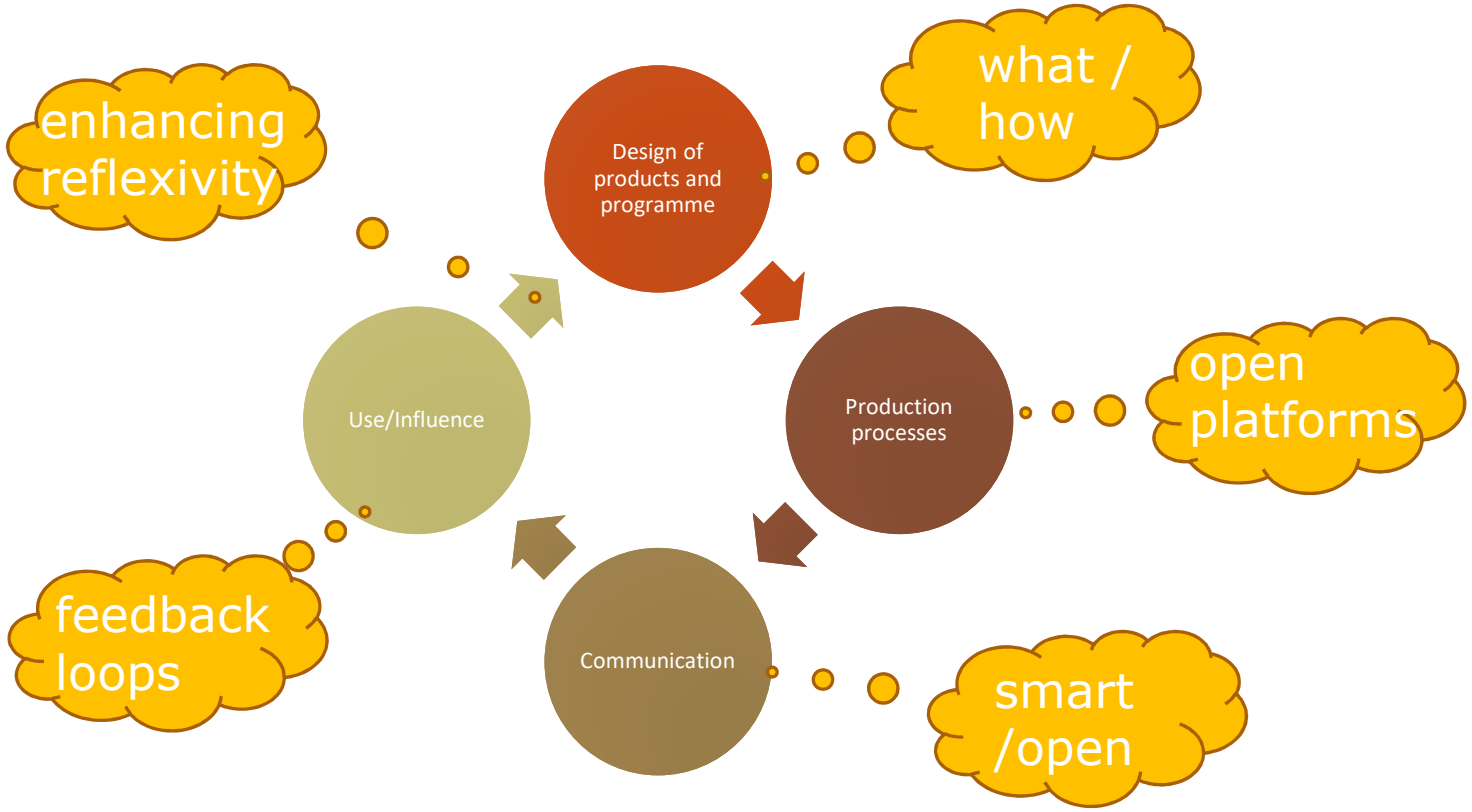


Relationships between the use and influence of indicators.

Missing: Evidence

Lehtonen, M., Sébastien, L., Bauler, T.: The multiple roles of sustainability indicators in informational governance: Between intended use and unanticipated influence. Current Opinion in Environmental Sustainability 2016(18), pg. 4

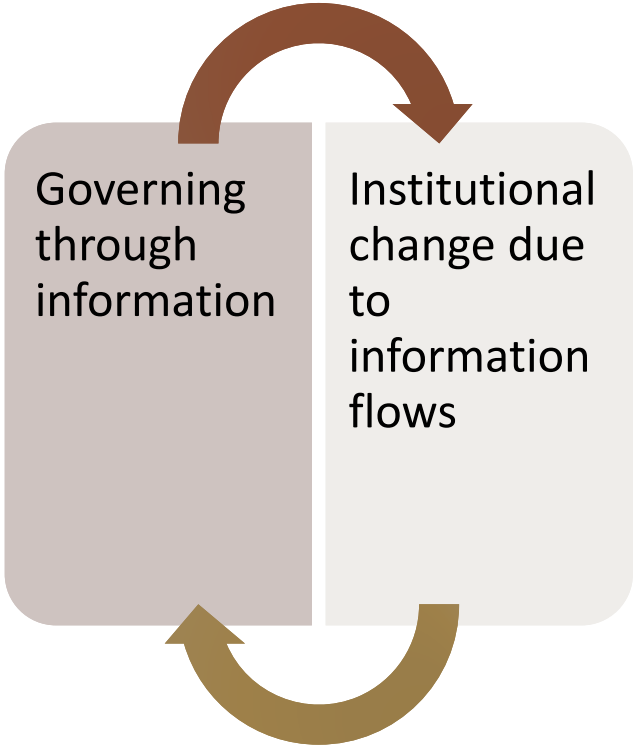
Mainstreaming communication in the process chain



Governance 4.0

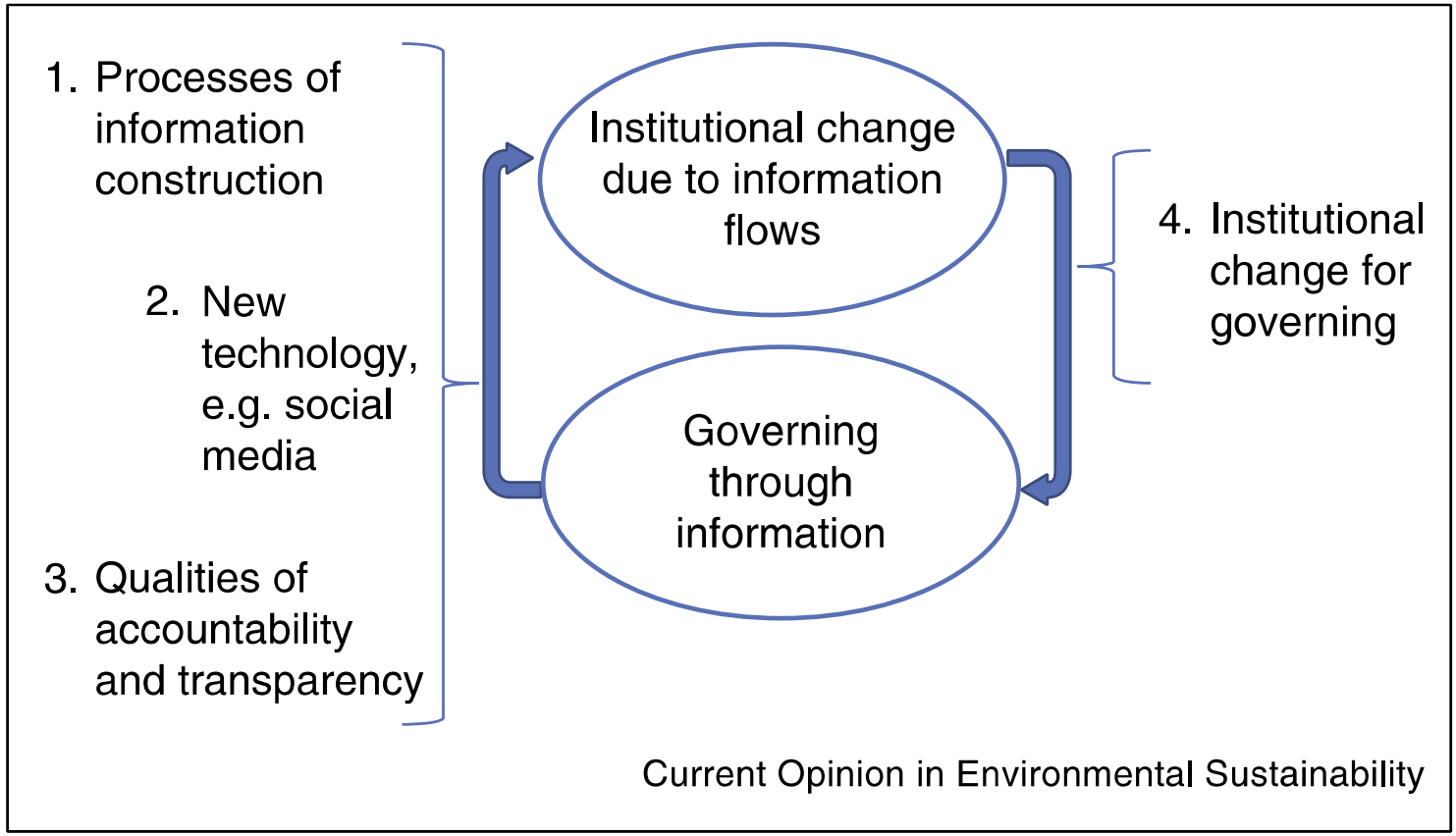
INFORMATION – POWER - INSTITUTIONS

Political Rationality



Source: Soma, K., MacDonald, B.H., Termeer, C.J., Opdam, P.: Introduction article: informational governance and environmental sustainability. Current Opinion in Environmental Sustainability 2016(18), 132 (2016)

Figure 2



Interrelated themes of informational governance.

Soma, K., MacDonald, B.H., Termeer, C.J., Opdam, P.: Introduction article: informational governance and environmental sustainability. Current Opinion in Environmental Sustainability 2016(18), 134 (2016).

Open questions

Statistics and data science in public administration: Who is responsible for what?

Professional values and ethics, revision of the ES Code of Practice, evaluation of the status quo, analysis, gaps, recommendations, ethics for all three core statistical processes (design, production, communication)

Segmentation of statistical products (indicators, accounts, statistics and their quality profiles, experimental statistics)

Ethics for decision-makers and their scientific services

Statistical competence: intensified co-operation between the education system (including vocational training) and official statistics

International statistical governance

- Global conventions that go beyond today's recommendations
- new regulatory framework for access to mechanically generated data for official statistics

Last but not least

Official statistics have shown an excellent record of the role of trustworthy authority at the crossroads of three fundamental rights:

- data protection (a person's right to privacy),
- freedom of information (a person's right to open and transparent information) and
- statistics (the right of a person to live in an informed society).

Continuation of this success story is the main objective for Official Statistics 4.0

Thank you

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