



Les indicateurs sont morts – vive les indicateurs !

Towards a political economy of S&T indicators : a view of the past 40 year

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Introduction

The meaning of the enigmatic title of my presentation will be the object of my conclusion.

The objective of my presentation is to propose a story – I will be here in story – telling, not yet pretending at history – a story of S&T indicators production and use over the last 40 years. A story of the development of the ‘S&T indicators movement’ over the past decades, in about one generation.

To do so, my methodological postulate is that one must articulate the societal, the scientific and the S&T indicators sub-systems – to identify their mutual interactions in time, hence the need of a diachronic analysis – here 40 years.

Needless to say my presentation will be sketchy; I add it will be possibly provocative, possibly pessimistic, but hopefully allowing for reflexivity and for discussing perspectives for the S&T indicators movement.

From start, I must say that my presentation will be fully compatible with the one of Ismael Raffols yesterday morning. It will be a different way to address similar issues, diagnostics and perspectives. We have had no communication, but I see a strong convergence.

PART 1 : S&T indicators as agnotology vs knowledge devices

Prior to jump into the story, five clarifications are needed.

1 ► Agnotology: social construction of ignorance [word coined from the Greek *Agnosis* – not known] – think of the artificial scientific controversy over of climate change, and the book *Merchants of doubt*, Oreskes and Conway.

2 ► The double translation model of research activities of Callon and Latour:

(a) from macro-cosme [outside, real, wild world] to micro-cosm [laboratory] - for laboratory work and knowledge production [in this secluded, controlled and simplified world with small number of variables, holding the assumption of ‘everything being equal’],

(b) back to the macro-cosme where the knowledge gained is then applied in the real – wild world, knowledge being the basis for action. Scientifically based action.

I agree with Ismaël it is exactly the same process for indicators design and use, the laboratory being data bases.

The first translation is the framing or design, the second is the use.

As we know, all translations are treasons, particularly in the social arena where the assumption of ‘everything being equal’ does not hold, and the double translation may conflict with the need of contextualisation.

3 ► The design of an indicator embodies a vision and an intention

An indicator is a parameter characterising an object. The definition or design of an indicator results from two decisions:

- the conceptualisation of the object (choice of attributes which ‘represent’ it),
- the selection of the parameter considered as characterising the object, i.e. its feature considered relevant, therefore to be measured and become the yardstick for comparison.

In other words, an indicator embodies

1. (a) a conceptualization or theory – in short, a vision,
2. (b) an intention even an injunction – relative to the object under consideration.

An indicator is a value laden device, literally saturated with representations and norms. Think of the h-index : a theory of citation and an injunction to produce the most papers with the most citations.

Critical issues: does the indicator measures what it pretends to measure ? If yes, is the measurement reliable ? If yes, is it, in the first place, the relevant thing to measure ? And, anyway, does the underlying conceptualisation of the object make sense ?

4 ► Indicators as devices of agnotology – the social construction of ignorance

If the indicator is used at face value, it is considered it measures what it pretends to measure, with de facto acceptance of the vision and intention embodied in the indicator.

After a while, the indicator is considered to be the undisputable reality of the object: it has substituted the object, it has become the object, it is the object. The indicator has been naturalised – considered a part of the real / wild world, as a ‘fact’ of nature.

It has become the object of intention, it has become the objective.

There is obviously a trick here and the indicator has become a device of agnotology – the social construction of ignorance. This is all the more tricky

- that it is an easy (and lazy) way to work (just repeat the measurement), with quickly built locks-in and irreversibilities in data bases time series and specialised know-how,
- that the indicator is disguised in the clothes of the instrument of quantitative, called scientific knowledge about the object.

The crime was perfect and in addition many have an interest in it: ignorance is perfectly built. This is how indicators can be daunting - formidable instruments of agnotology.

5 ► Indicators as robust knowledge devices

By contrast, indicators can be knowledge devices.

More precisely, they can be robust knowledge devices: when stakes, expectations and uncertainties are high, robustness, beyond reliability, is required. A piece of knowledge is called robust if it stands when confronted to a variety of practices and contexts which make sense to a variety of actors.

Indicators can be vectors of robust knowledge if their use is the occasion of questioning the vision and intention which they embed, in other words, of performing a critical analysis in the form of a debate involving a variety of actors and perspectives. This leads to a co-production of knowledge.

Indicators in this case are considered as debatable objects with a capability to lead to reflexivity, addressing issues of meaning and sense.

Being laden with values, representations and norms, the indicators are prone to criticism and debate, which make them powerful devices for robust knowledge production.

PART 2

A brief story of S&T indicators in their societal and scientific context

I will contrast two periods and assess the present situation.

PERIOD A - 70's to 90's

■ society: cold war, late post WW2 period, fordism, welfare state, catching up with the US model of production – consumption and scientific production ; BUT premisses of major changes (oil crisis...) and also period of ideological maturation for the next period: Reagan and Thatcher, Uruguay round (negotiations to suppress tariff barriers) – but effects of these reforms not yet pervasive.

■ science : science as progress and rationality; emergence of science and innovation policies a major public policies ; creation of FPs.

■ S&T indicators : emergence of a whole new field, following OECD input indicators development (Frascati manual), start of bibliometrics;

Recall there is no internet, data storage with 1 Mega diskettes; basically one journal (Scientometrics, edited in Hungary), few indicators, national level, few sectors / fields, costly. SCI begins to be commercialised; the NSF S&E indicators serves as a reference.

Mid-80s: start of an S&T indicators scientific community at EU level through FP funding (Monitor programme), as part of the science studies – science policy community.

The objective is a better characterisation of the science system for better science policies and thus better S&T inputs for well-being. Scientometrics for the public good.

I add an important dimension in the emerging movement: the contribution to the building a Europe which was our new frontier.

These were the foundations of the S&T indicators movement in the 80s.

PERIOD B - 90's to 10'

■ society : the neo-liberal ideology sweeps the world and imposes its related competition and competitiveness paradigm; rise of China; ICT revolution ; innovation & technological promises race.

■ science : science system is fully absorbed in the neo-liberal paradigm at institutional (rankings), journal, project (funding), researchers (HRM) and cognitive (IP) levels in line with the advent and generalisation of New Public Management.

■ S&T indicators

Huge expansion of indicators, in particular bibliometric: have become ubiquitous, universally and instantaneously accessible, up to date, available at all scales from the individual to the world. Have become the infrastructure for generalised competition in science and its linkage to the financial markets.

Parallel development of a huge and highly profitable industry of scientific information / indicators (journal editors, ICT giants, consulting firms). Emergence of a powerful scientifico-industrial complex supporting (an supported by) this indicators infrastructure.

THE PRESENT : where do we stand now ?

■ society : demonstration and shared consciousness of humanity having entered the Anthropocene – profound disruption of the earth, but also economic and social machine – Humanity having also entered what I call the ‘Trumpocene’, which reflects a profound disruption of our collective values, including those regarding science. I must add Brexit as a sign of this.

■ science : New practices, racing as a standard, signs of disruption in the science system (issues of reproductibility, of credibility - fake scientific journals) ; confidence in science undermined by pervasive conflicts of interest through ubiquitous corporate funding ; In parallel: S&T promises (transhumanism, augmented humans, immortality, AI, GMOs...) based on our inability to accept our finiteness, finitude); competitiveness through innovation turned illusion and hype as economic and research funding and research policy paradigm. Instrumentalisation of science seen as a brand with highly valuable attributes for firms - to be acquired through appropriate strategies (research funding, scientist hiring & sponsoring, expert groups and journals boards infiltration, media influence and campaigns, legal action, political funding...)

Ever larger gap between what is expected from science and what is delivered (cf the Grand Challenges). Scientific activities developping as a squirrel running in its cage. Collective blindness through acceleration of unquestioned S&T activities.

PART 3. The S&T indicators community is confronted to its collective responsibility

I suggest this story leads for three hypothesis, leading, if they are valid, to a perspective for the S&T indicators community.

Hypothesis 1: in period B, S&T indicators are largely used a agnotology devices

The story above reveals a massive contradiction:

- the programme of the indicators movement set up in period A, is a total failure – recall that S&T indicators raison d’être was to provide knowledge and understanding so that science policy could foster the production of relevant

science to be put at the service of humanity for its well-being - while today, a generation later, the earth, social and science systems are in disruption,

- at the same time, the S&T indicators movement is an incredible success story: a huge operational success, a source of a large and profitable industry, reshaping practices and strategies of all components of the science system, all over the world, in line with S&T indicators pointing positively (more and more science, more and more excellent),

How to explain this paradox ? How to make sense of this contradiction ?

The proposed hypothesis is that S&T indicators have fundamentally become agnotology devices. They contribute to our blindness and ignorance while pretending to provide understanding based on scientifically based indicators.

As we have seen, this results from inadequate design and inadequate use of indicators.

Hypothesis 2: dominant forces have driven the period B design and use of indicators

We must notice that the above-mentioned massive contradiction is not an issue in the policy circles, which is in line with the fact that period B indicators design and use have been supported and shaped by the dominant forces – which have found their interest in it.

It is straightforward to understand why: indicators have become the instruments of insertion of the science system into the neo-liberal ideology and practices. Providing a unified metrics is a central and necessary component to build markets, competition and linkage to the financial system.

Indicators have played a central function, at 3 levels in this respect: universal competition, translatability in monetary units, agnotology resulting in (false) certainties and focus on means, i.e. competitiveness (excellence) rather than on end and longer term implications. Hence their ‘success’

Hypothesis 3: the S&T indicators community has been conscious of the drift for some time but kept discreet, yet scientifically active

The S&T indicators community has been (discreetly) conscious of the misuses of the indicators and of the political intentions for which there were put to serve.

This resulted in a growing distance between it and the mostly commercial producers and providers of indicators, accelerated by the growing integration of indicators production and provision within or close to the ICT firms producing the data. Accelerated also by the barriers due to the proprietary nature of the data.

The indicators community has thus concentrated on research, being active in methodological developments and experimentations – away from the mainstream, which was largely developing on its own, mostly out of academia.

If the three hypothesis are correct, a major consequence follows, as a perspective for the S&T community:

Perspective: it is the collective responsibility of the S&T indicators community to call for ending with the agnotology paradigm and pave the way for new designs and uses

I suggest it is the role of our community to point it and highlight it.

The situation is such that it calls for urgent changes, possibly leading to a consensus with the dominant forces on the necessity to build robust knowledge for science policy.

All the more much has been and is being done in that perspective (think of the RISIS platform in particular).

Here come the perspectives outlined by Ismael yesterday.

Link knowledge production and decision making process: joint construction of knowledge and decision

Opening the outputs, deliberation

Broadening the inputs – expand the collectives

The time is ripe to go from the agnotology paradigm to the robust knowledge production paradigm for indicators.

Conclusion: les indicateurs sont morts, vive les indicateurs !

Indicators of period B are dead – at least, many people can agree they should be so. We cannot afford agnotology indicators any more. We have no time to waste.

So: vive les indicateurs - long life to the indicators, in their new paradigm. And there is urgency here and we are prepared for it !