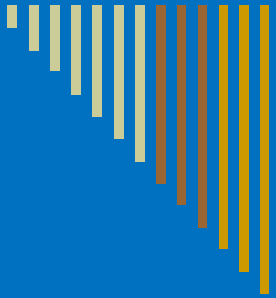


Open science in knowledge-society: buona scienza in buona società

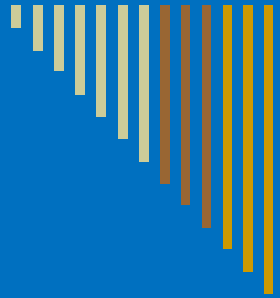
Andrea Cerroni

**Master in Comunicazione della Scienza e dell'Innovazione Sostenibile
Università di Milano-Bicocca**



□ **Questione di buona scienza**

□ **Questione di buona società**

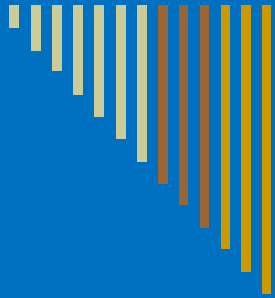


Big data & huge theory: oltre l'oggettivismo (e il soggettivismo)

Data don't speak by their own:

- theory ladenness
- olismo dei controlli (strumentazione, statistica, ipotesi...)
- cosa conta come “evento” (background, taken for granted...)
- la scienza costruisce **modelli** ideali di potenziale uso pratico

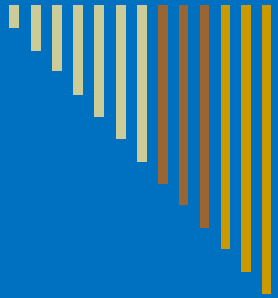
- Verità → utilità, semplicità, coerenza, completezza, plausibilità... **accettazione pubblica**



La sociologia della scienza studia scientificamente come la scienza viene fatta: **riflessività della scienza!**

È scienza quella conoscenza che si afferma perché resiste alle argomentazioni tese a confutarla e si impone attraverso il convincimento più ampio.

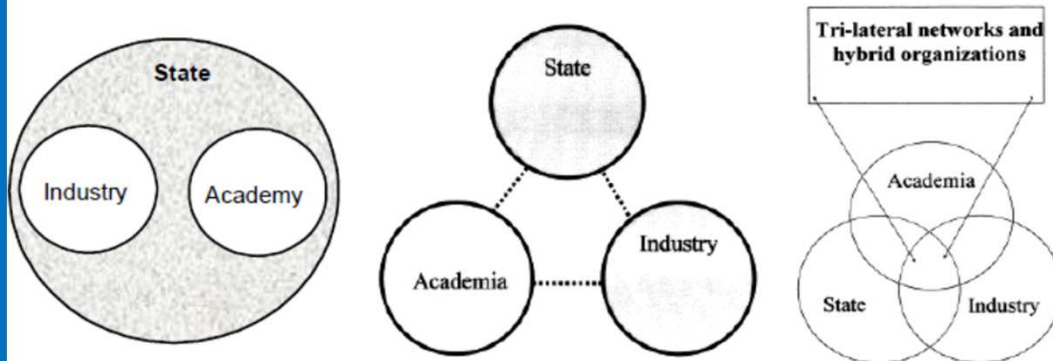
La scienza è dunque un prodotto comunicazionale.



Quale modello per la scienza
nella knowledge-society?

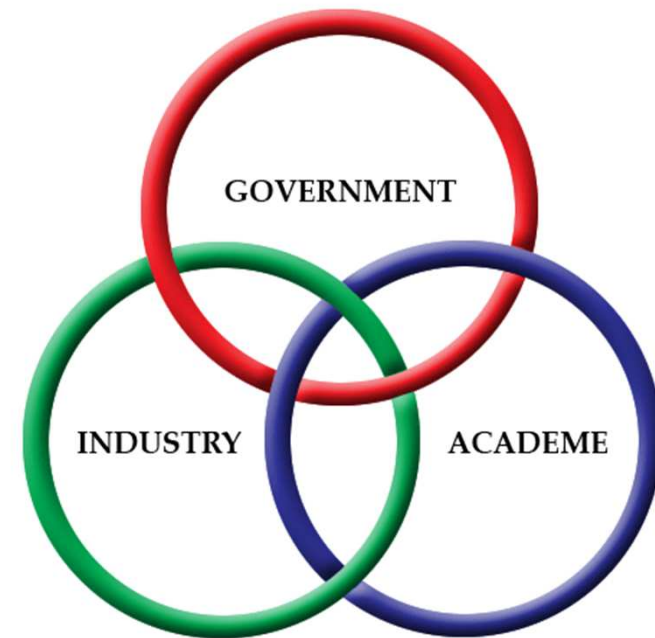
Cittadini?

Figure 1: From the Statesman and Laissez-faire the Triple Helix

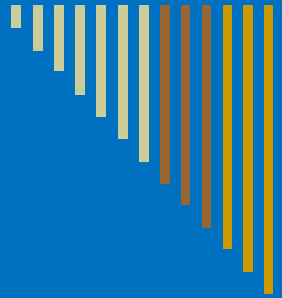


Source: Adapted of Etzkowitz & Leydesdorff (2000, p. 4).

THE TRIPLE-HELIX MODEL



Source: Henry Etzkowitz and Loet Leydesdorff, 2000
Diagram: www.techpinoytrend.blogspot.com (03 March 2011)



Chi deve partecipare alla scelta scientifica?

Antichità:

- Epistémè: ogni animale razionale
- Éndoxa: i più esperti pongono i presupposti indimostrabili

Scienza moderna: i *peer* per aiutare i meno esperti

K-society: ogni knowledge-able citizen!

Journals review: peer or poor?



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Randy Schekman

Profile

Randy Schekman, a cell biologist, is the winner of the 2013 Nobel prize for medicine, and editor of *eLife*, an open-access science journal.

Latest



How journals like Nature, Cell and Science are damaging science

9 Dec 2013: Randy Schekman: The incentives offered by top journals distort science, just as big bonuses distort banking

278 comments

ELISA KITS
proteins
and more

5%
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+
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Open science to better science

This article is part of the supplement: [Controversies in Breast Cancer 2010](#)

Short communication

Highly accessed

Classical peer review: an empty gun

Richard Smith

Correspondence: Richard Smith richardswsmith@yahoo.co.uk

Author Affiliations

35 Orlando Road, London SW4 0LD, UK

Breast Cancer Research 2010, **12**(Suppl 4):S13 doi:10.1186/bcr2742

The electronic version of this article is the complete one and can be found online at: <http://breast-cancer-research.com/content/12/S4/S13>

Published: 20 December 2010

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Short communication

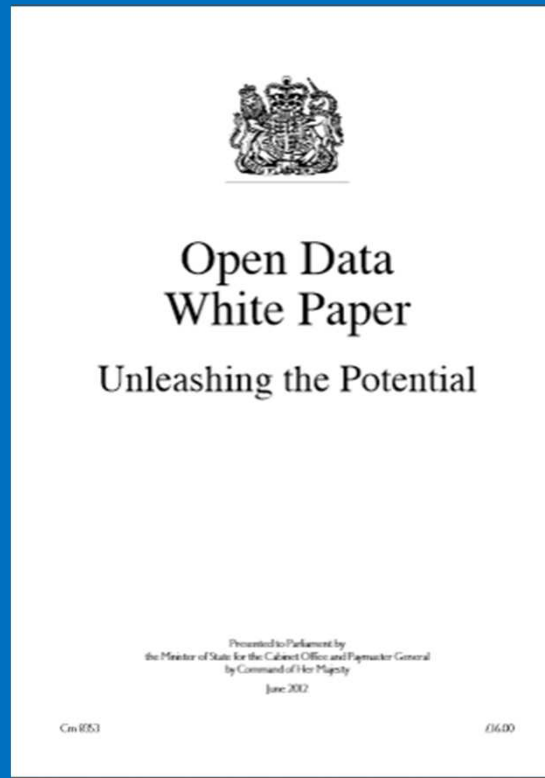
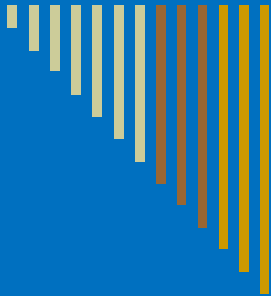
If peer review was a drug it would never be allowed onto the market,' says Drummond Rennie, deputy editor of the *Journal Of the American Medical Association* and intellectual father of the international congresses of peer review that have been held every four years since 1989. Peer review would not get onto the market because we have no convincing evidence of its benefits but a lot of evidence of its flaws.

Yet, to my continuing surprise, almost no scientists know anything about the evidence on peer review. It is a process that is central to science - deciding which grant proposals will be funded, which papers will be published, who will be promoted, and who will receive a Nobel prize. We might thus expect that scientists, people who are trained to believe nothing until presented with evidence, would want to know all the evidence available on this important process. Yet not only do scientists know little about the evidence on peer review but most continue to believe in peer review, thinking it essential for the progress of science. Ironically, a faith based rather than an evidence based process lies at the heart of science.



Poor review?

- Paradox: too much expert to be equal/open minded?
 - How to select peers and to manage controversies?
 - What about cronyism?
 - Are you sure two minds think better than one?
 - Across the same journal, too much differences in scientific value.
 - What about databases?
 - “Publish or perish” or “Quality or quantity”?
 - Essential tension: creativity vs tradition
 - ... Bibliometric illusion...
-



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**OPEN ACCESS AND CANADIAN UNIVERSITY PRESSES:
A White Paper**

Prepared for the Association of Canadian University Presses by
Andrea Kwan

The Association of Canadian University Presses gratefully acknowledges the Department of Canadian Heritage for its support of this project through the Canada Book Fund.



OPEN ACCESS AND CANADIAN UNIVERSITY PRESSES: A White Paper

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Green Paper on Citizen Science

Citizen Science for Europe
Towards a better society of empowered
citizens and enhanced research



socientize



Citizen Science

Citizen Science refers to the general public engagement in scientific research activities when citizens actively contribute to science either with their intellectual effort or surrounding knowledge or with their tools and resources.

Participants provide experimental data and facilities for researchers, raise new questions and co-create a new scientific culture. While adding value, volunteers acquire new learning and skills, and deeper understanding of the scientific work in an appealing way. As a result of this open, networked and trans-disciplinary scenario, science-society-policy interactions are improved leading to a more democratic research based on evidence-informed decision making.

This open and participatory approach is gaining a renewed impulse thanks to the digital revolution. It represents an effective scenario for many of the values of the Europe 2020 strategy and becomes relevant across many of the topics of the imminent Horizon 2020 programme, presenting potential links with other EU programmes. Outcomes vary in a wide range of values in scientific, social, economic, educational, environmental and inspirational levels.



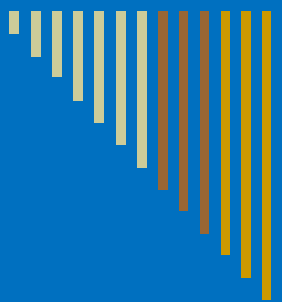
socientize

White Paper on Citizen Science for Europe



In Citizen Science, a broad network of people collaborate. Participants provide experimental data and facilities for researchers, raise new questions and co-create a new scientific culture. While they add value, volunteers acquire new learning and skills and gain a deeper understanding of the scientific work in appealing ways. As a result of this open, networked and transdisciplinary scenario, science-society-policy interactions are improved, leading in turn to a more democratic research based on evidence and informed decision-making.

Citizen Science encompasses a wide range of activities carried out by several actors at multiple levels. We find massive and occasional virtual interactions on a global scale as well as regular, proactive and continuous involvement in local environments. There is no single definition of Citizen Science but rather a series of definitions that reveal the dynamics of this research approach which is continually evolving and implies new collaborative activities and shared objectives between the main stakeholder groups.

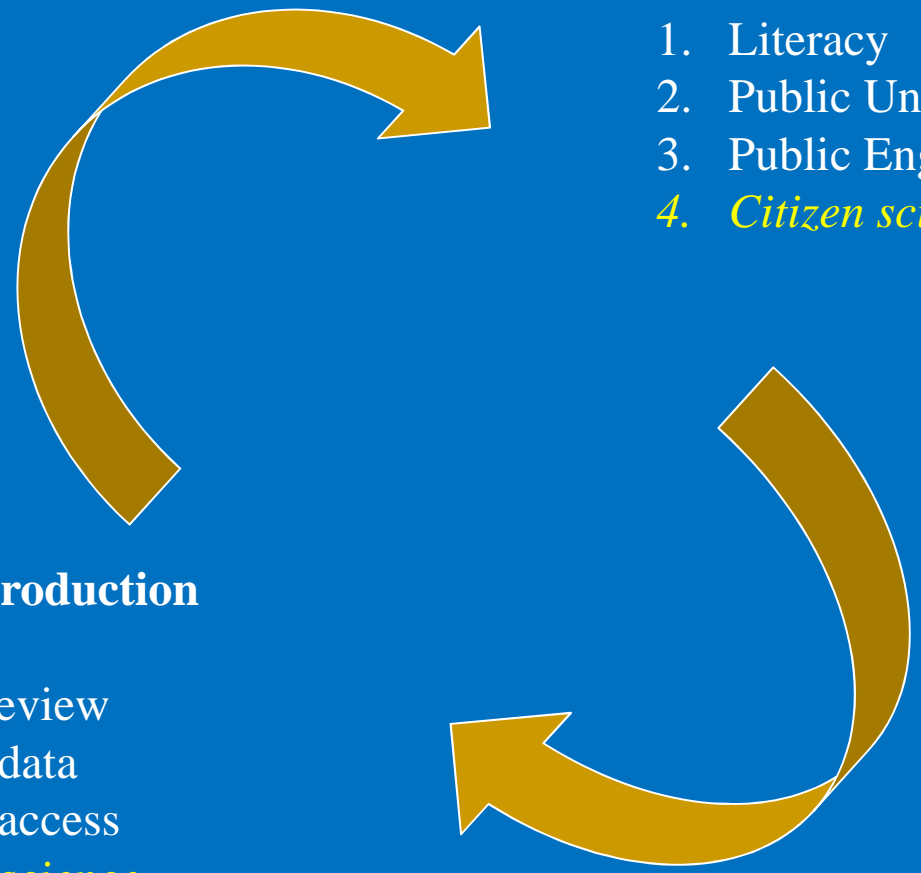


Science communication

1. Literacy
2. Public Understanding of Science
3. Public Engagement in S&T
4. *Citizen science* (participatory science)

Science production

1. Peer review
2. Open data
3. Open access
4. *Open science*





Il cambiamento sociale

■ Tre rivoluzioni:

- coscienza (**mente**) < 40.000 a.C.?
- agricolture (**terra**) \approx 10.000 a.C.
- industria (**capitale & lavoro**) > XVIII sec.

■ La quarta rivoluzione (conoscenza) > 1914/1945

knowledge-economy

&

citizens society



Knowledge as a common good

- More than **non-rivalrousness** → *cooperative good*
- Less than **non-excludability** → *club good*
- **Partial confinement** → *political good*

It is a common good depending on governance, not a “natural”!

Science communication:

every process making knowledge a real common good.



SOCIAL PHENOMENA: I - S - K



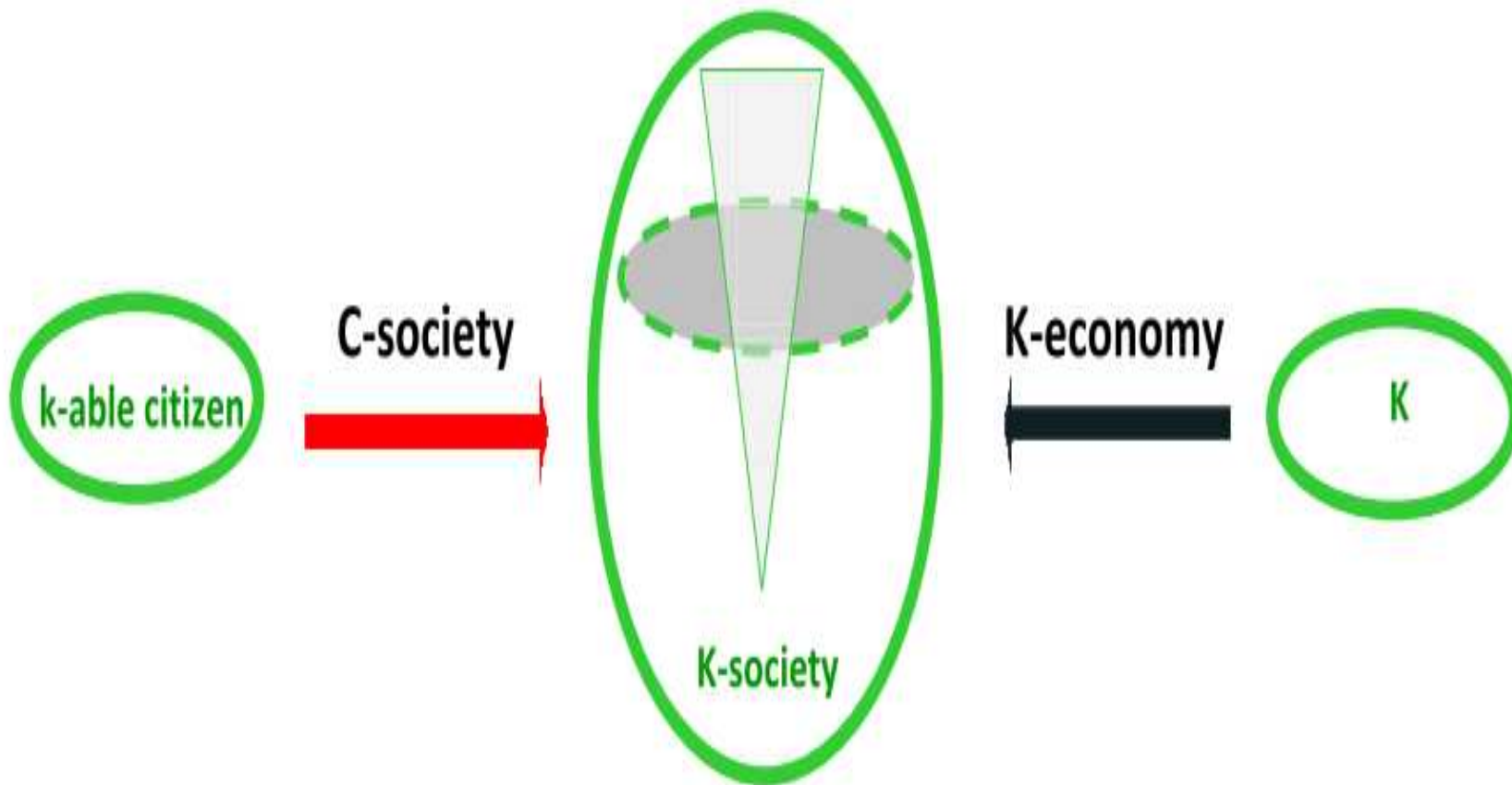
INDIVIDUAL

SOCIETY

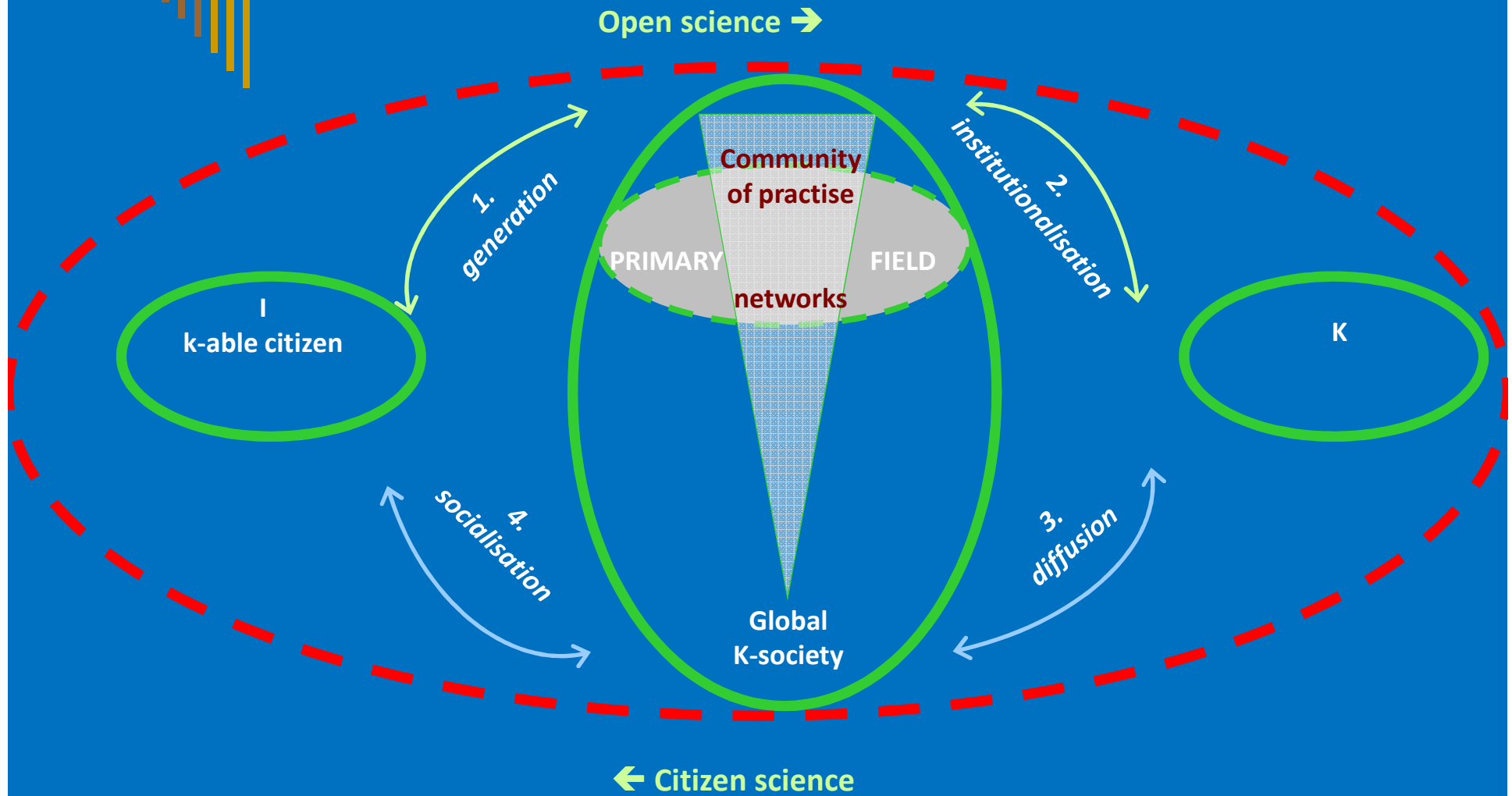
KNOWLEDGE

logic diagram

K-circulation (enlarged communication)



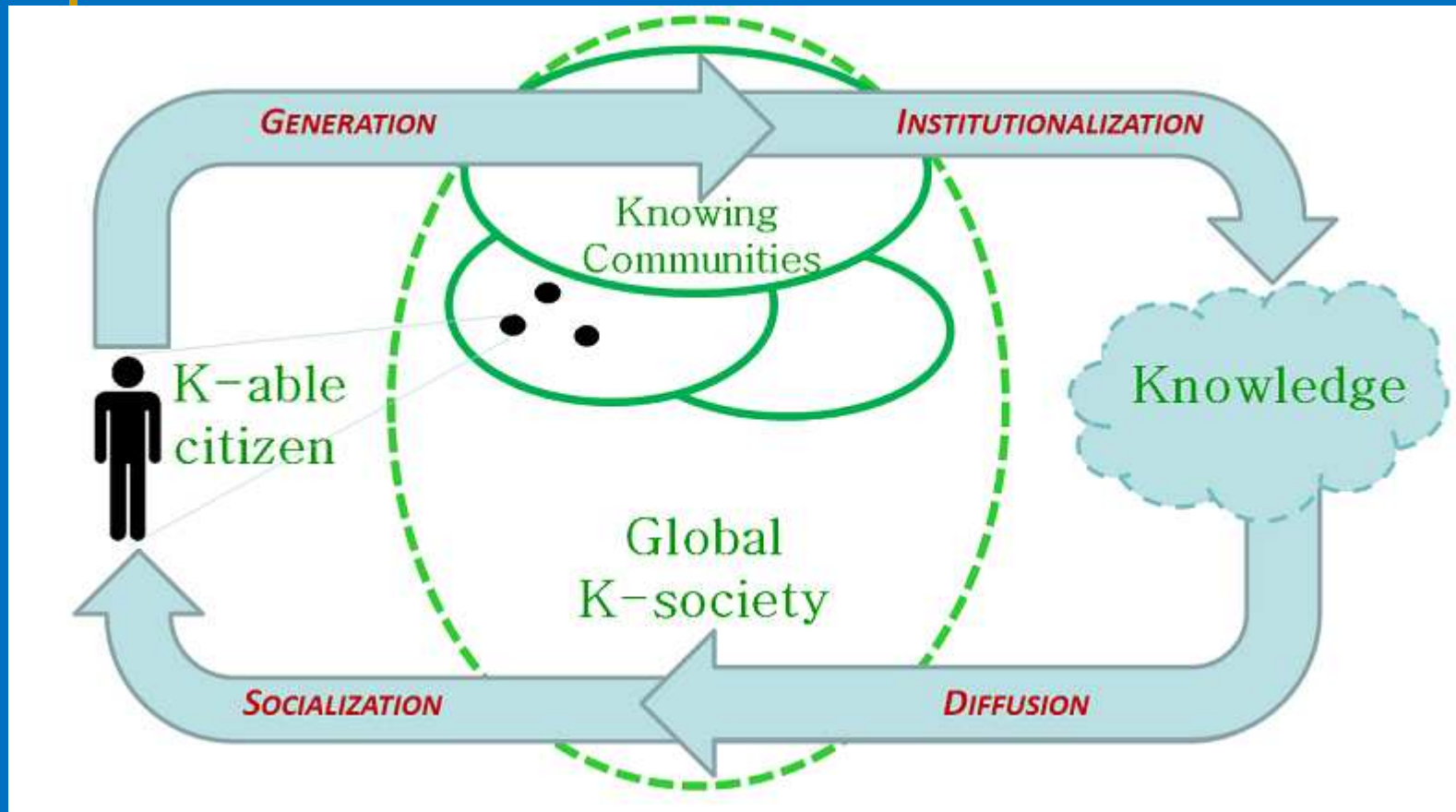
K-SOCIETY (enlarged communication)



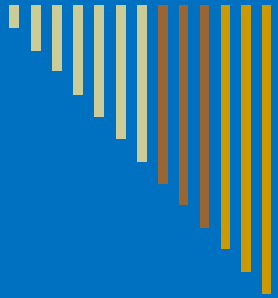
logic diagram

K circulation

Open science →

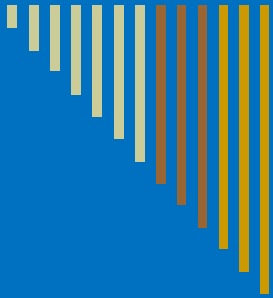


← Citizen science

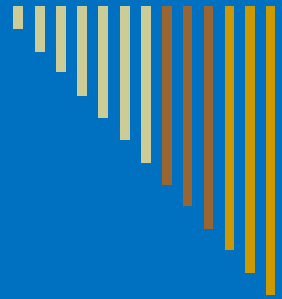


4 (logic) phases model

- **Generation:** I guess...
- **Institutionalisation:** Pls, give us more *data!* *Who* are you to say that? Are you *sure?* Have you taken into account *this and that?*
- **Diffusion:** Did you *ever* know? Why don't you use this piece of *innovation!* What a wonderful *masterpiece!*
- **Socialisation:** and now, you have to know *such and such*, in order to do/be *so and so*, to think *like we do*, otherwise...



Open science to better society!



Science and democracy: together or none

- **Science** needs good citizens (beyond technocracy):
 - Brain power (numbers, openness, civicism)
 - Thought freedom (qualified public opinion)
 - Common sense applied with rigour

 - **Democracy** needs good knowledge (beyond demagoguery):
 - Knowledge-able citizens for good democracy
 - Social & natural sciences for good policies (coproduction)
 - Knowledge (extended typology) as means and ends
-