Yet another story of networks! Prospects for performing «responsible innovation» in research institutions

François Thoreau
Wed., November 9th
S.NET, Tempe, AZ

Layout

- Public policies in nano: A mandate for Responsible Innovation and «Integration»

- What does it entail to initiate (fruitful) collaboration?

- What can we learn from the institutional setup, in terms of collaborating?

Nanotechnologies

- Disciplinary convergence?

- Ethics and governance (EC), *ethics as a means for governance*. Common feature = reflexevity (EU MASIS report)

  There is also reflexivity, in the sense that appreciation of as well as concerns about the roles and impacts of science in society have become an occasion for governance of science-in-society. The emergence of technology assessment and the more recent emphasis on ethics are examples of reflexivity (p. 27)

- Literature on institutions

Responsible innovation?

Nanotechnology must be developed in a safe and (responsible) manner. Ethical principles must be adhered to and potential health, safety or environmental risks scientifically studied, also in order to prepare for possible regulation. Societal impacts need to be examined and taken into account. Dialogue with the public is essential to focus attention on issues of real concern rather than "science fiction" scenarios.

European Commission, 2004

unprecedentedly open and engaging process. The collective goals and specific objectives articulated in the Strategic Plan will support world-class interdisciplinary nanotechnology research, sustain and expand critical infrastructure, train and inspire the next generation of scientists and engineers, and support responsible development and transfer of nanotechnology into commercial applications to benefit the Nation's economy and the American people.

An Act

To authorize appropriations for nanoscience, nanoengineering, and nanotechnology research, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "21st Century Nanotechnology Research and Development Act".

(10) ensuring that ethical, legal, environmental, and other appropriate societal concerns, including the potential use of nanotechnology in enhancing human intelligence and in developing artificial intelligence which exceeds human capacity, are considered during the development of nanotechnology by—

(C) insofar as possible, integrating research on societal, ethical, and environmental concerns with nanotechnology research and development, and ensuring that advances in nanotechnology bring about improvements in quality of life for all Americans; and

Integration

- Integration?
  Action *of integrating:* **Combine** *one thing with the other so that they become a* **whole**

- Tentative definition *Transdisciplinary collaboration that aims to integrate the societal dimensions of new and emerging technologies within R&D processes (*"*into ongoing sociotechnical processes to shape their eventual outcomes*"*)*

- Part of the agenda of «anticipatory governance», see Barben al., 2008; epistemology of Trading zones and Interactional Expertise; Galison 1997; Collins & Evans 2002; Gorman, al. 2004

- Anyhow: entails cross-disciplinary collaborations (resonates with disciplinarity framing in nano)

Argument

- Prospects for individual collaborations?

- «Argument: if one is to engage with science and technology practitioners, then one should closely examine the **shape of the institutional network** those find themselves embedded in.»

- Why? We encline to think that nanotechnologies have revolutionized the workplace (and the institutional settings) in the first place

The state of the network matters

- «The behaviour of actors, and more generally their definition, changes with the state of the network, which is itself the product of previous actions» (Callon, 1991, pp. 153-154)

- // Institutions in political science and evolutionary economics

- "Techno-economic networks and irreversibility." Pp. 132-165 in A Sociology of Monsters: Essays on Power, Technology and Domination, edited by John Law. London: Routledge.)

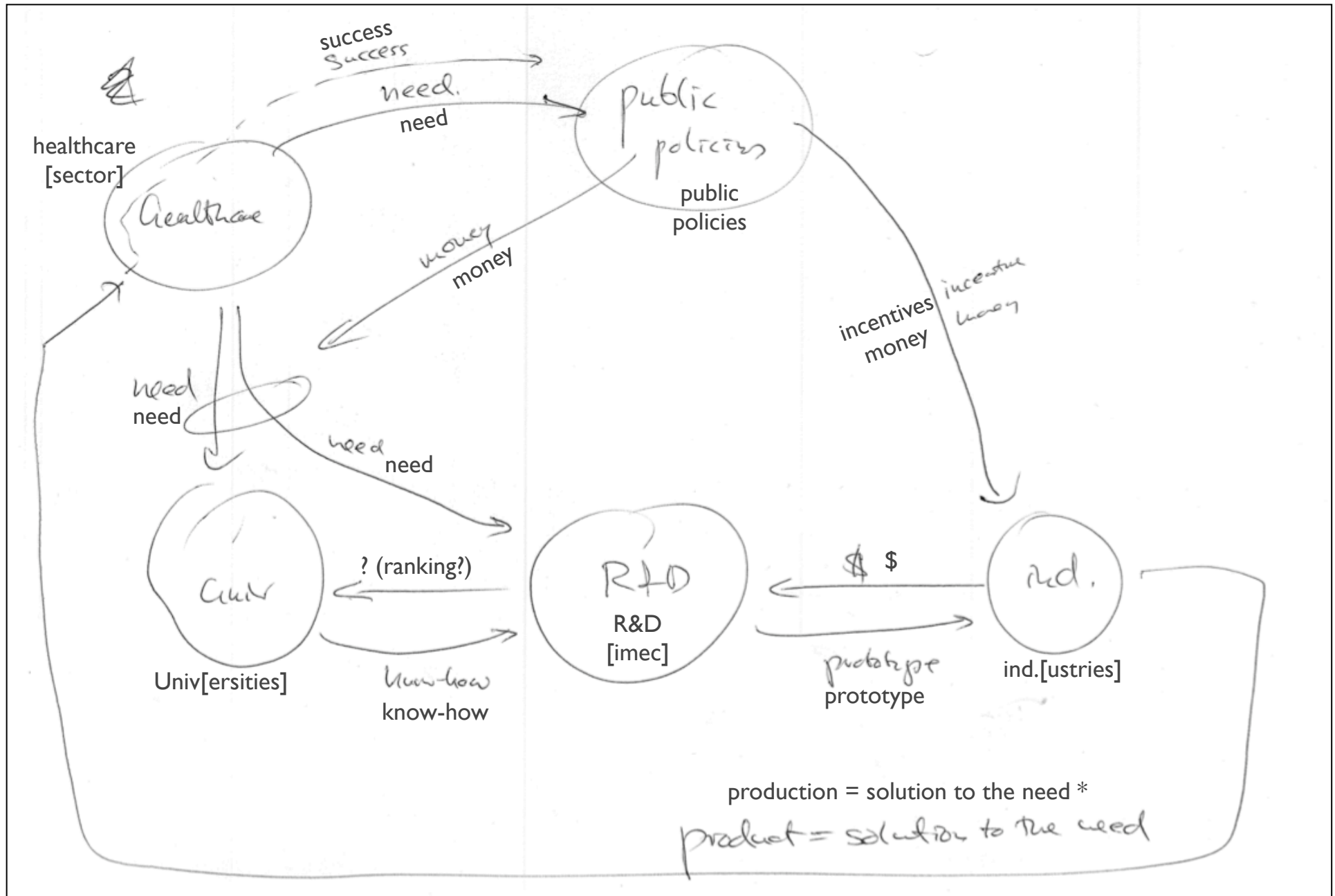# Two different types of networks

- *Stabilized networks*:

  - low costs of information circulation (shared grounds)

  - (very) competitive environment

  - «states of the world» known *ex ante,* with reasonable predictibility

  - expanded networks (far-reaching translations stabilized) whereas cooperation is a strategy to decrease costs or gain power

- *Emerging networks*:

  - high costs of knowledge replication (entails labs, knowl., skills replication)

  - exclusive, rare environment, inner singularity

  - «states of the world», research outcomes eventually written *ex post*

  - rather small network so need to expand it and create chains of translation to «generalize» the knowledge being produced
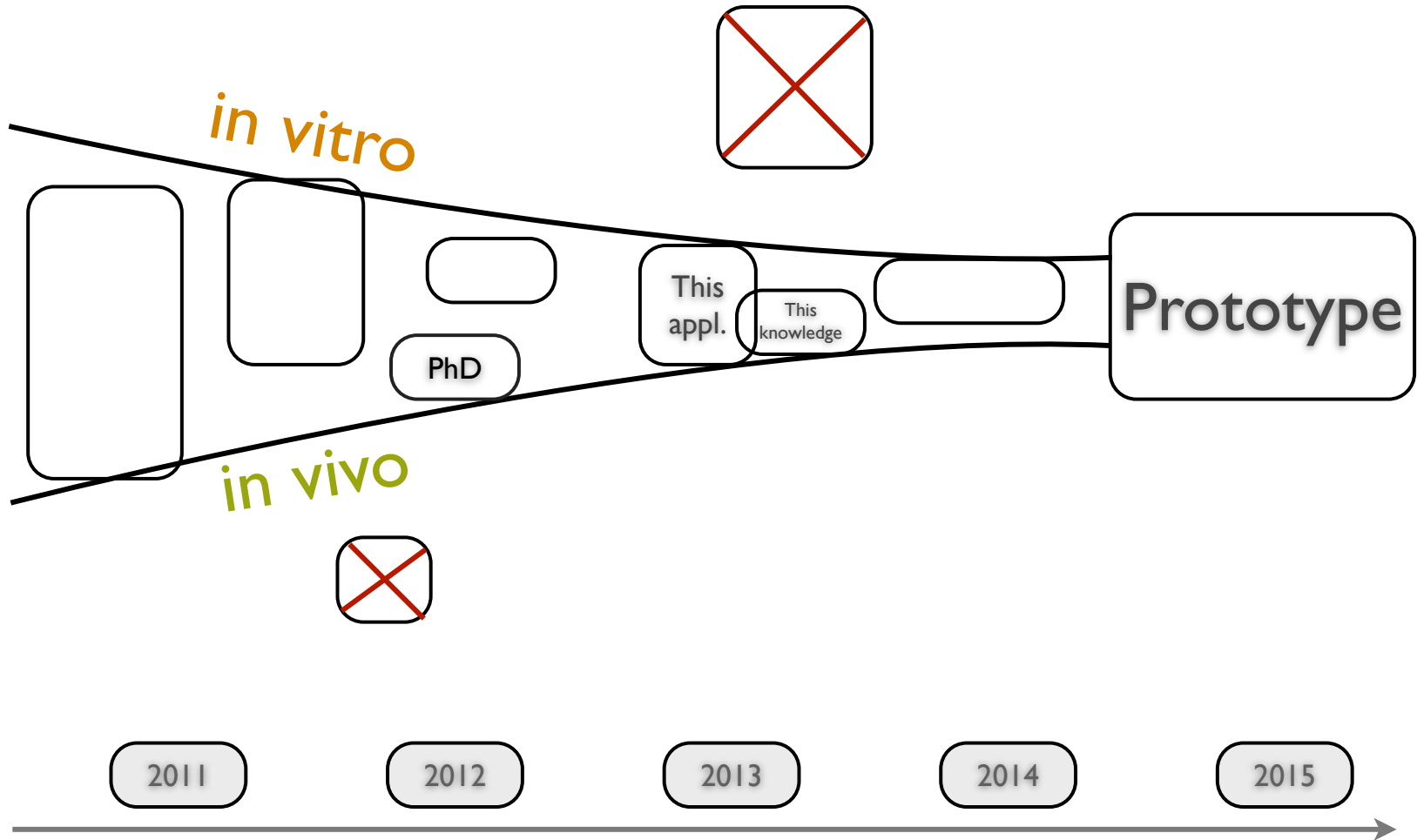
success
success

need.
need

healthcare
[sector]

Healthcare

public policies

public
policies

money
money

incentives
money
incentives money

need
need

need
need

? (ranking?)

Univ

Univ[ersities]

R&D

R&D
[imec]

$ $

ind.

ind.[ustries]

know-how
know-how

prototype
prototype

production = solution to the need *

product = solution to the need

* meet the needs = the very basic aim of R&D firms like imec, according to Wolfgang

Roadmap

in vitro

in vivo

This appl.

This knowledge

PhD

Prototype

2011   2012   2013   2014   2015
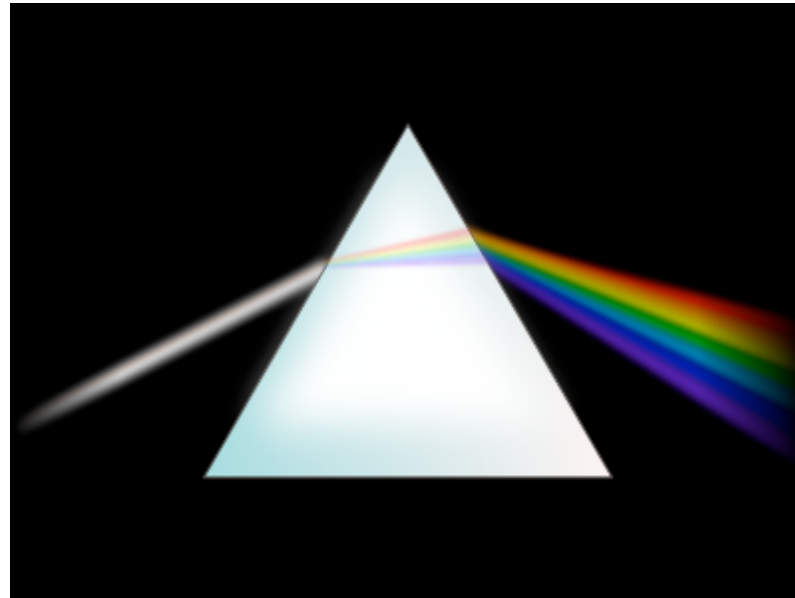
imec translations

- Defining a business plan for your prototype in a highly competitive environment (neuroprobes: Clinatec, IBM, ...)

- Well-prepared business plan and highly-desirable return on investment

- Open business model vs. Many stabilized options

- Strong hierarchy, division of tasks and labour

- Highly stabilized states of the world and increasingly homogeneous network

Photonics optics and experimental diffractive physics

UCL translations

- Assembling networks to have instruments that *will* stabilize (thus perpetuate) the institution

- Very low competitive environment (i. e. programmes d'excellence)

- Limited institutional mandates: mandatory new alliances, but few obligations of results and freedom of means (instruments, careers)

- Destabilized states of the world (but tentative heterogeneity of the network), need to perform translations

Counter-intuitive intermediary conclusion

- Shape of networks matter because it defines what it is you produce (information vs. knowledge)

- The cutting-edge R&D center is the rather stabilized network

- Old Academy is the rather emerging network

- Is it just a matter of applied / fundamental? The shape of networks could have been the other way around (translational R&D while academic research may close on itself)

What of our encounters with practitioners?

- IMEC vs. UCL : which «profile of action» for individuals (Callon, 1991)?

- Institutions set the **conditions of possibility** of collaboration
  ⇨ characterization

- What of reflexivities?
  What of the outcomes?

Thank you!

<u>fthoreau@ulg.ac.be</u>