

Research Infrastructures: Making the case and setting the scene

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Definition of a Pan-EU RI (ESFRI)

A "Facility" for service to "Research" which:

- Offers cutting-edge, essential service to research, on a non-economic basis, within an ERA outlook;
- Awards free open access through international peer-review competition at world level;
- Results published/shared in the public domain;
- Proprietary and/or training access is marginal;
- Clear pan-European added value: e.g. at least 30% of selected users coming from non-host countries.

Can be single sited, distributed, virtual;... lifetimes between years (satellites) and centuries (libraries)...

Why are we here?

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- RIs are needed in all science fields
- No single EU Country can provide them all
- While other Nations can: e.g.: India, US, China...,
 (only in few cases global approach needed)
- The EU (ERA) needs to have same capability
- Most EU Countries can contribute with their RIs or by participating in joint ones
- We need to develop, operate, upgrade, reorient, ...
 pool, limited resources, as an overall EU "system"
- This requires common understanding and "culture"
- And this is the scope of RAMIRI

Research: what does it mean?

- Political + media discourse mix together, under the name of "Research", three activities with very different goals & economic aspects: <u>Research, Development, Innovation</u>—otherwise well defined by international rules:
- <u>Research</u>: produces new knowledge, i.e. <u>discoveries</u> (previously unknown!!, i.e. unpredictable): (very rare economic return to investor: 100% public allowance)
- <u>Development</u>: produces new solutions, i.e <u>inventions*</u>, by the use of existing knowledge: (some economic return to investor, albeit risky: ≈50% public allowance)
- Innovation: successfully improves existing solutions (economically self-sustaining: <≈25% allowance), rarely connected only to S&T, but often to finance, marketing, organization,......

^{*}new products, processes, methods,....

Research, Development and Innovation: which drivers?

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- Driver to new knowledge: mainly curiosity and exploring (other motivations are less driving)
- Driver to inventions: need to solve a problem (economic, defense, sport,....research)
- Driver to innovations: need to win (a market, a challenge, a competition,.....and in research!)
- Research is a powerful driver for Development (D), for Innovation (I)....and Education (E).
- Success is based on "peer competition": same driver!
- This is why RIs MUST offer "open access" for R: owners will reap benefits in D, I, E (and improve their R)

RAMIRI

Therefore.....

- Research Infrastructures are "non economic" (Research is a non self-sustaining activity)
- But...if they compete to be attractive at world level, then: they must continuously "develop", "innovate", "educate": these parts can provide economic gains.
- International RIs need special qualities to be attractive and need to please many "stakeholders", each one expecting a different part/taste of the "pie"
- Planning, governing, managing RIs means to understand all stakeholders, respond and account in the most complete and effective way: therefore RIs are also powerful drivers of quality in Management!



Development Infrastructures

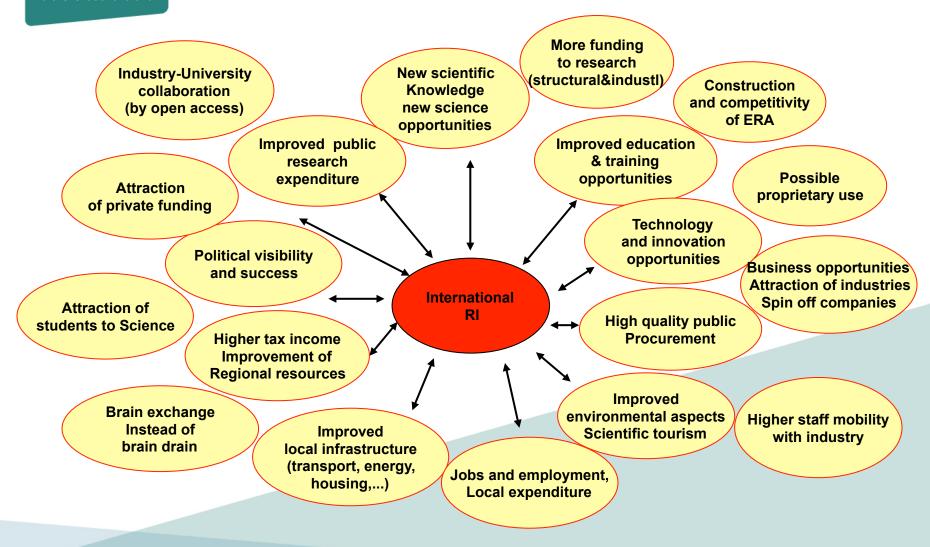
Some infrastructures imply (mainly) Development activities, but often are called RIs (and sold as such):

- The International Space Station and ITER
- A Formula 1 car and most "test facilities" (e.g. wind tunnells, simulation chambers, etc)
- A joung Marconi developing the Radio...
- Most industrial "applied research" is, in fact "development"

Its main driver is "relevance" as well as quality,

Returns and Stakeholders

RAMIRI



....with different motivations

(anthropology of the stakeholders)

Science community

New science opportunities

education&training opportunities

Construction of ERA

More funding to research & industry support

Political environment

Construction of ERA

Improved public research expenditure

Political visibility and success

Higher tax income & attraction of Private funding

Regional environment

Attraction of industries& private funding

Improved local infrastructure (transport, energy, housing,...)

Jobs&employment +local expenditure

Improved environmental aspects

Industrial environment

Technology and innovation opportunities

Business procurement opportunities

Possible Proprietary use

Industry-research collaboration (through open access)

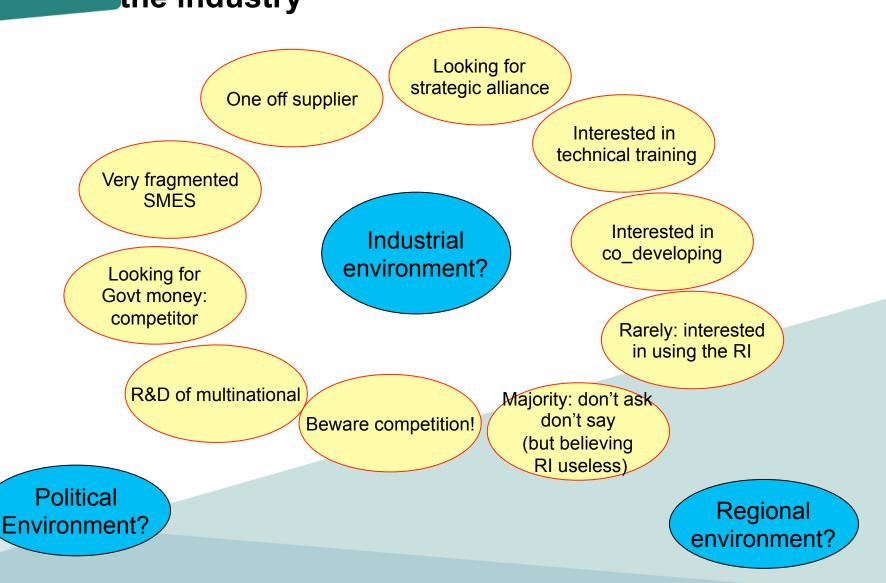
Increasing economic motivation

RAMIRI2 Amsterdam 2011

The picture is a bit more complex

RAMIRI The "academia" Excellence is Strong lobbiers forever Pure science should Opinion makers be isolated What is in it for me? Taking away from me? Against any large initiative Very fragmented Mono or multi Science The friend of the local politician "community"? Very organized monodisciplinary International, National. What is this Typical researcher Local bureaucracy? = most conservative "animal" Majority: don't ask Different institutions Don't say Uni. Acad. Res. Ctre different agendas

The picture is a bit more complex the industry



Summary

- Our problem is:
- How can we explain? (not always data available)
- How can we obtain? (fund raising, and best use)
- How can we ensure results? (and get sustainability)
- How can we manage a complex environment...
-to achieve something which is very different from "normal" economic culture?
- Which are the "narratives" and "best practices" used until now?: can they be improved?

examples of "narrative"

- Who invented the RI's? (in the middle ages...)
- What other accepted activity is popularly known and similar enough? (Olympic games...)
- How can "open access" be justified?
- How are socio-economic returns optimized?

.....And now let's work seriously!