Industrial Innovation and R&D

Knowledge/learning spillover to industry

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R&D - Innovation: hierarchy or combination ?

Curiosity Driven research *(fundamental research)*

- Sometimes seen as the most noble form of research, breakthrough research

Dyonisos research

Dionysos : a son of Zeus. The god of wine, ecstasy, and… intoxication

The Nobel prize, Szent Györgyi said that there are 2 types of researchers, according to the Greeks:

The Dyonisos system, opening new avenues and the Apollo system that strives to perfect existing research lines

« **The Dyonisos researcher only has an idea about the general direction he wants to go, in search of the unknown. He has no clear idea of what he will discover and how.** »

R&D - Innovation: hierarchy or combination ?

Industrial (*or applied*) research

- Sometimes seen as engineering achievment or improvements

Appolo research

Apollo : a son of Zeus. Apollo is the god of the Sun, dreams, and reason. Appolo research is more linked to the market. It is an answer to problems of productivity, competitivity,…

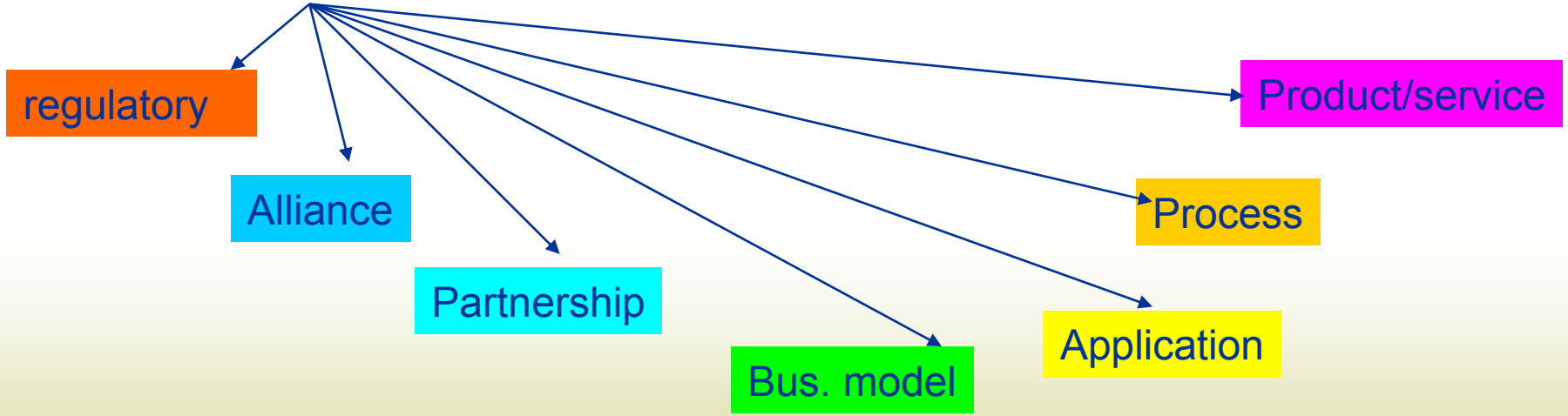
« **The Apollo researcher has a clear idea of the future lines of his research and is able to design a clear project** »

R&D - Innovation: hierarchy or combination ?

Innovation (from invention to marketable product or service) → commerce (marketing & sales)

« Innovation is society in the making » (Pierre-Benoît JOLY. Senior Research Fellow. INRA/SenS)

Innovation

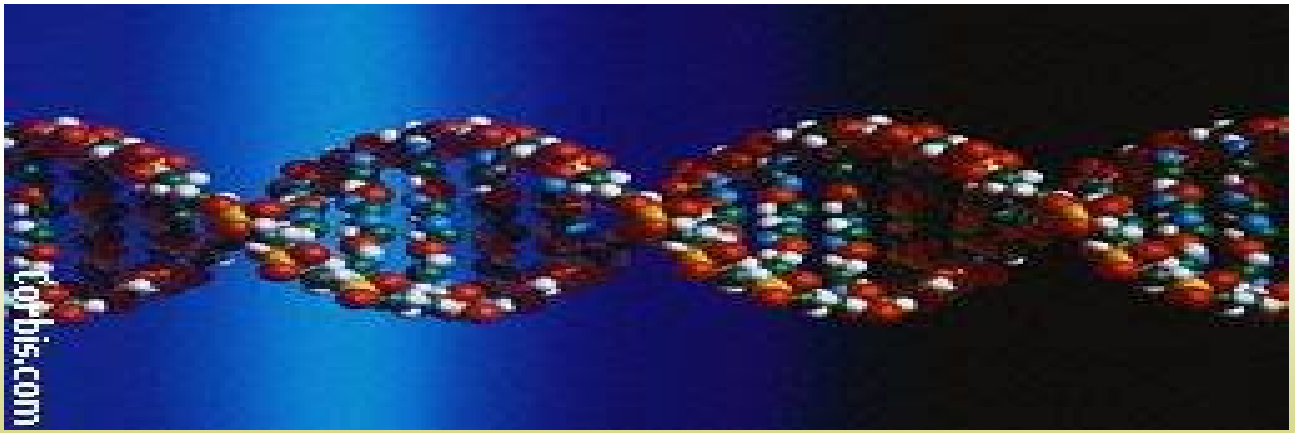


R&D - Innovation: hierarchy or combination ?

*Are not in a **hierarchical** but more in an **interacting (helicoïdal)** relation.*

Applied research allows for creation of instruments and tools that allow fundamental research to make new discoveries, that, in their turn allow to develop new applications, that allow to develop instruments and tools…etc.

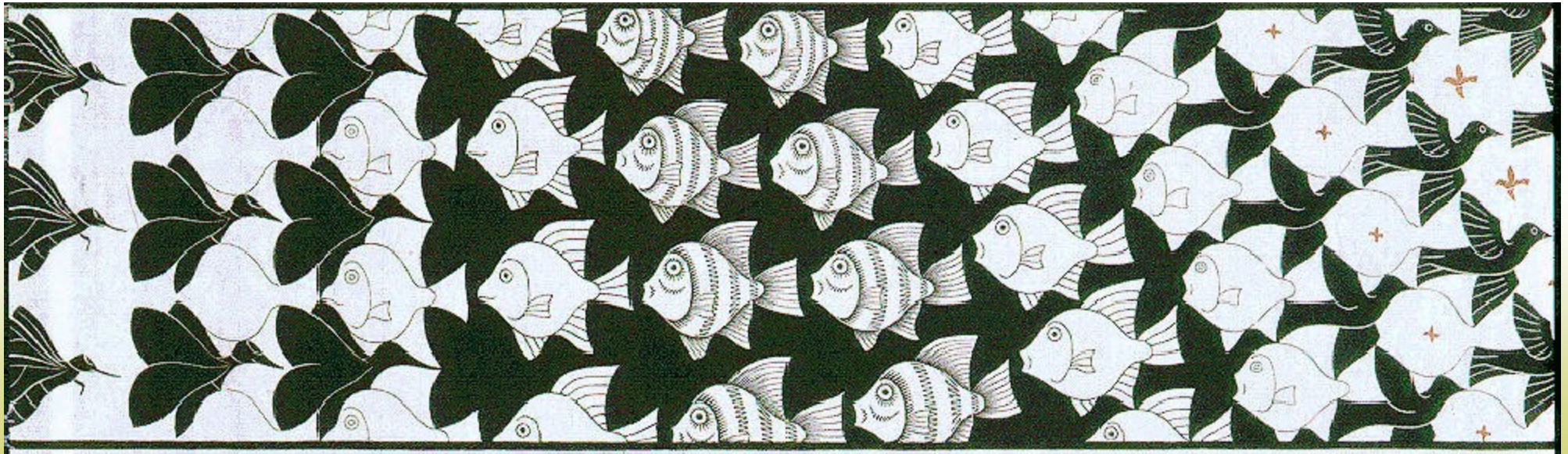
(cf. tunnel effect microscope, IBM Switzerland 1986 → nanotech & quantum mechanics)



R&D - Innovation: hierarchy or combination ?

None of us is as smart as all of us! (Japanese proverb)

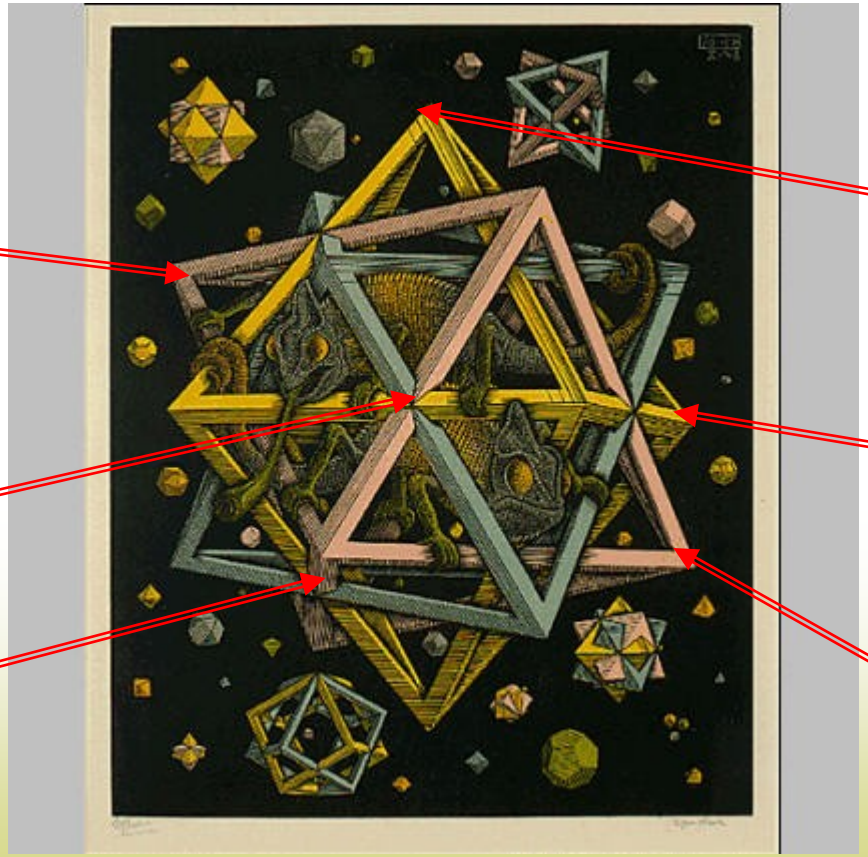
Hence we promote a 2D approach linking industry, RTO's (Research and Technology Organizations) and Universities (the research continuum dimension) on one hand



R&D - Innovation: hierarchy or combination ?

on the other hand linking all these organisations in a world R&D network

(the international dimension we develop in industrial research)



IRI
USA

JRIA
Japan

ANPEI
Brazil

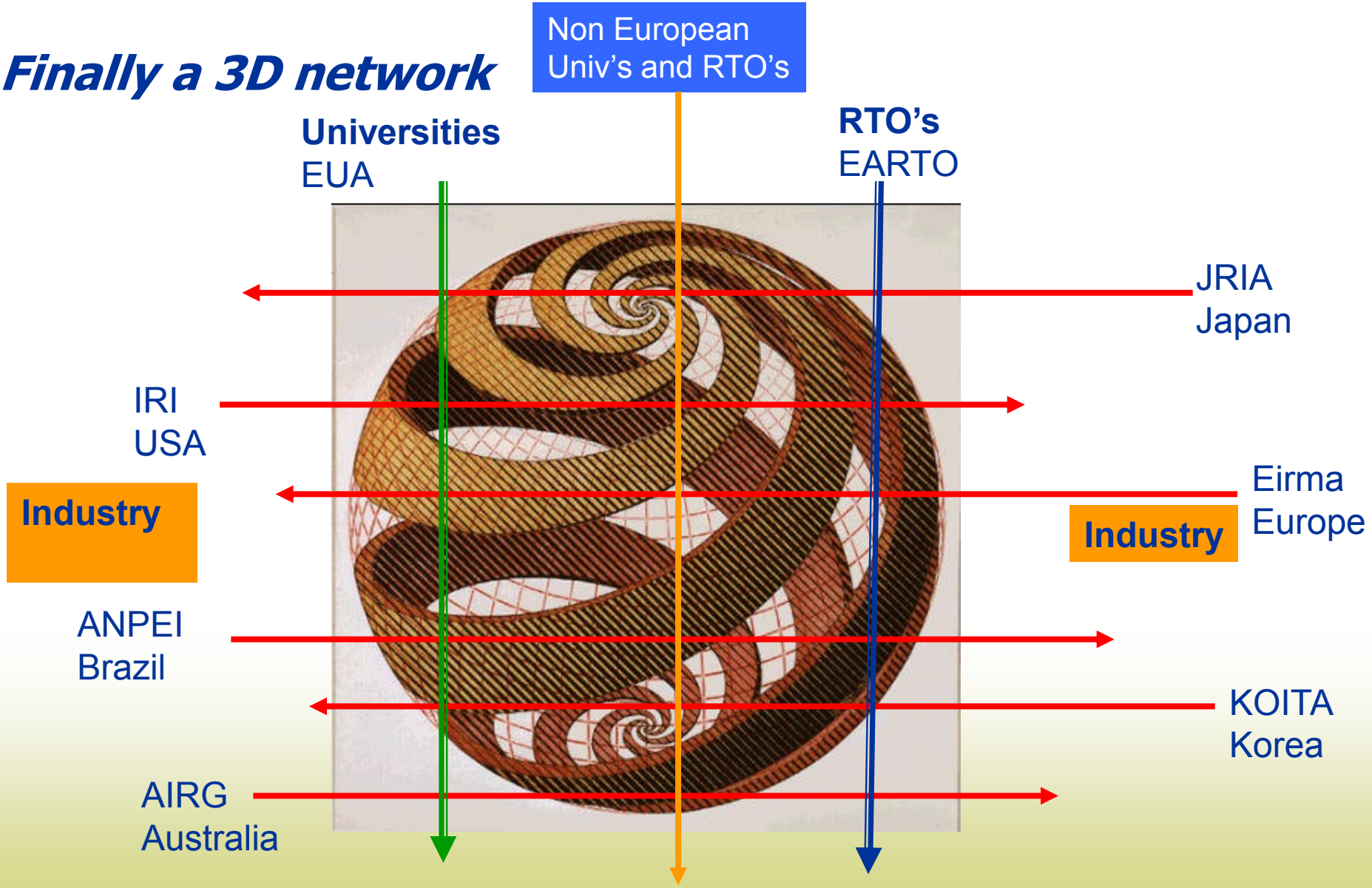
Eirma
Europe

AIRG
Australia

KOITA
Korea

R&D - Innovation: hierarchy or combination ?

Finally a 3D network



I- What is EIRMA?

II- In the news today

III- Tools for innovating in a complex world

IV- Responsible Partnering

I - What is EIRMA?

is an **independent** not-for-profit organisation

provides a **European perspective** on the global management of applied R&D and innovation

engages +**115 major companies** which are based in 18 countries
operating in a **wide range of sectors**

gathers world-class R&D performers

– Vision and Mission

« EIRMA aims to be the preferred network for European open exchange of best practices in research, development and innovation for a sustainable world, across all industrial sectors »

Through its new mission statement

« EIRMA enables to foster the best possible industrial research, development and innovation ground in Europe by promoting exchange of best practices, experience sharing and networking with the ultimate goal of making European R&D and Innovation and a major contributor to a more liveable, sustainable world and an attractive place for its major stakeholders. »

What does EIRMA offer?
Three Complementary Legs

Provide a balanced overview,
make effective use of members' time and effort,
help achieve synergies, demonstrate impact and value

Programme of events

+/-15 meetings per year
in various forms & for different audiences

Publications

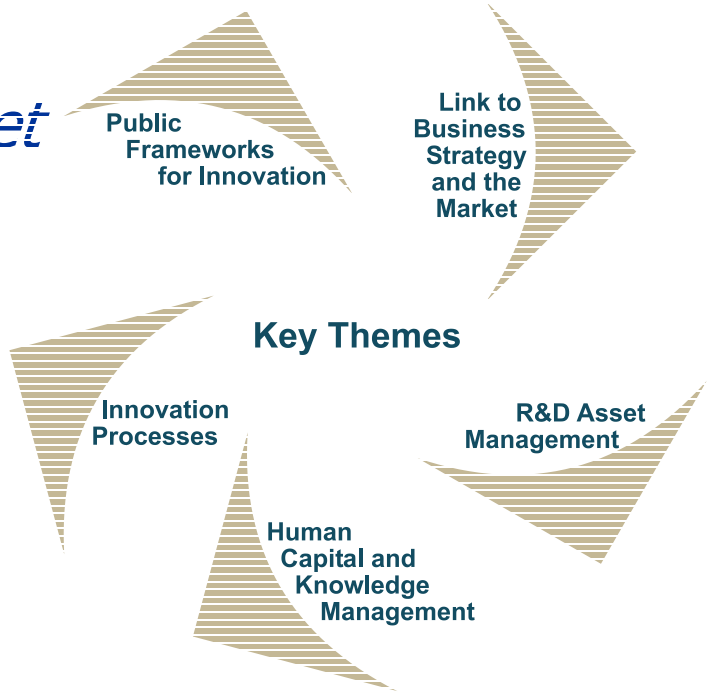
Electronic and printed information
(Website, Reports, Meeting Records)

Outreach (Special EU / DG Research Round table /FP8/ April 6) in Brussels

Public policy work at European and International levels
External talks, sister organisations, etc.

A **topical programme (members generated)** as a basis for informal benchmarking organised around **five main themes**:

- *Link to Business Strategy and the Market*
- *R&D Asset Management*
- *Human Capital and Knowledge Management*
- *Public Frameworks for Innovation*



A clear focus on improving global business performance through **more effective applied R&D**

II- In the news today

Europe horizon 2020 plan (>80 billion€)

Vision 2050 (WBCSD)

60% SME versus 40% large companies in Europe

Cloud computing

Protecting people is better than protecting jobs

The death valley between R&D and innovation

Irrational fears…and decisions (GMO, nanotech, stem cells,…)

Knowledge management

…

III- Tools in a complex world

Best of both worlds: reduce risk increase opportunities

Good old strategic watch (watch & anticipation)

Risk management / Innovation (2 sides of the medal)

Attitudes and ethics

Scenario and other prospective strategy methods

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The “wisdom of crowds” (+ communities of practice, open innovation)

Transdisciplinary approach: crossing boundaries

Build community resilience
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Complexity as a resource

Hypothesis:

Our world is a complex auto-adaptative system, with many interactive agents and with a hard to predict **emerging** future (i.e. The system can adopt a behaviour that the detailed knowledge of its components could not let anticipate)

Main idea:

turn the constraint of complexity into an opportunity

How?

Using some macroscopic tools

(cf. Harnessing complexity- R. Axelrod &M.D. Cohen; The Free Press- New York 1999)

Complexity as a resource

3 topics : variation, interaction & selection

Variation: balance out variety and uniformity

- one can balance

Exploration (encouraging new types) & **Exploitation** (keeping existing types)

Complexity as a resource

Exploitation: natural tendency in industry (adjacent innovation, frugal innovation)

Exploration: natural tendency in fundamental research, is best in industry when:

- Long term and general order problems
- Impact of exploration to be readily measured
- Risks well evaluated, acceptable and no irreversibility (cf. Kourilsky's)
- "not much to lose syndrom": i.e. bad outcome anyway
- Breakthrough innovation, Process and Product/service innovation

Complexity as a resource

Interaction

Agents do interact→ do we want to increase interactions or limit/block them with barriers in space or time?

- Examples of situations:
  - ✓Social networks promotion or reducing
  - ✓Silicon Valley (expertise+ social patterns)
  - ✓New York's garment district, Chinatown,... (communities of practice)
  - ✓Diamond industry (New York, Antwerp, Mumbai) / apprenticeship

Question: who should interact with whom /what and when?

A must**: trust and cooperation**

Complexity as a resource

Selection (in view of a given strategy)

- Which strategies to abandon and wich ones to duplicate or create?
- In other words, which selection to be made, to promote a given adaptation
  - ✓In biology → natural selection
  - ✓In our case : be able to **EXPLORE** new possibilities while **EXPLOITING** achievements
- Innovation darwinism?

Build community resilience

To help people bear their fear, let them know it is ok to be afraid (but not paralyzed by fear)

Promote sense of community (fairness, friendship,...)

Optimism

Stability

Flexibility

Life long learning (LLL)

IV- Responsible partnering
Business, universities, RTO's

Responsible Partnering

In today's world of Open Innovation, it is vital that

- companies
- public research institutions (RTO's, Universities,…)

work together well and for mutual benefit.

Responsible Partnering is about **ensuring** that **collaborative research** activities and knowledge exchange are **effective and reflect partners' interests.**

We've developed guidelines, checklists and procedures to help make this happen (EUA, EARTO, Proton Europe, Eirma)

Responsible partnering
Business, universities, RTO's

Responsible Partnering

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Developed jointly, Responsible Partnering was **launched in March 2006** and validated through widespread consultations.

A Review Conference in Lisbon in **December 2007** assessed progress and identified next key steps.

The guidelines have helped to shape the European Commission's recommendations to Member States: Last version: 2009

Responsible partnering
Business, universities, RTO's

Responsible Partnering

Originally launched to address concerns over collaborative research and knowledge transfer, Responsible Partnering now extends into other areas, such as the education and training that people receive at Doctoral level and the role of the business community in encouraging young people to take up careers in research, technology and innovation, and dealing effectively with the requirements of Europe's State aid rules.

Responsible partnering
Business, universities, RTO's

Responsible Partnering is both a change of mindset and a practical set of tools.

- the mindset: a number of principles and policies to be adhered to by the management of interested partners will facilitate the development of more effective collaborations.
- On the practical: actionable recommendations on issues as:
  - Identifying good partners
  - Constructing the Collaborative Research Agreement
  - Self assessment guidelines
  - Support of governmental authorities

Responsible partnering
Business, universities, RTO's

Responsible Partnering is both a change of mindset and a practical set of tools.

Where to find it?

On the eirma website at:

http://www.eirma.org/sites/www.eirma.org/files/public/responsible_partnering_guidelines_200910.pdf

Thank you!

Want to know more?

Contact us at:

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Appendix 2: Back up slides

FAQ

Is EIRMA a "lobby organisation"?

No!

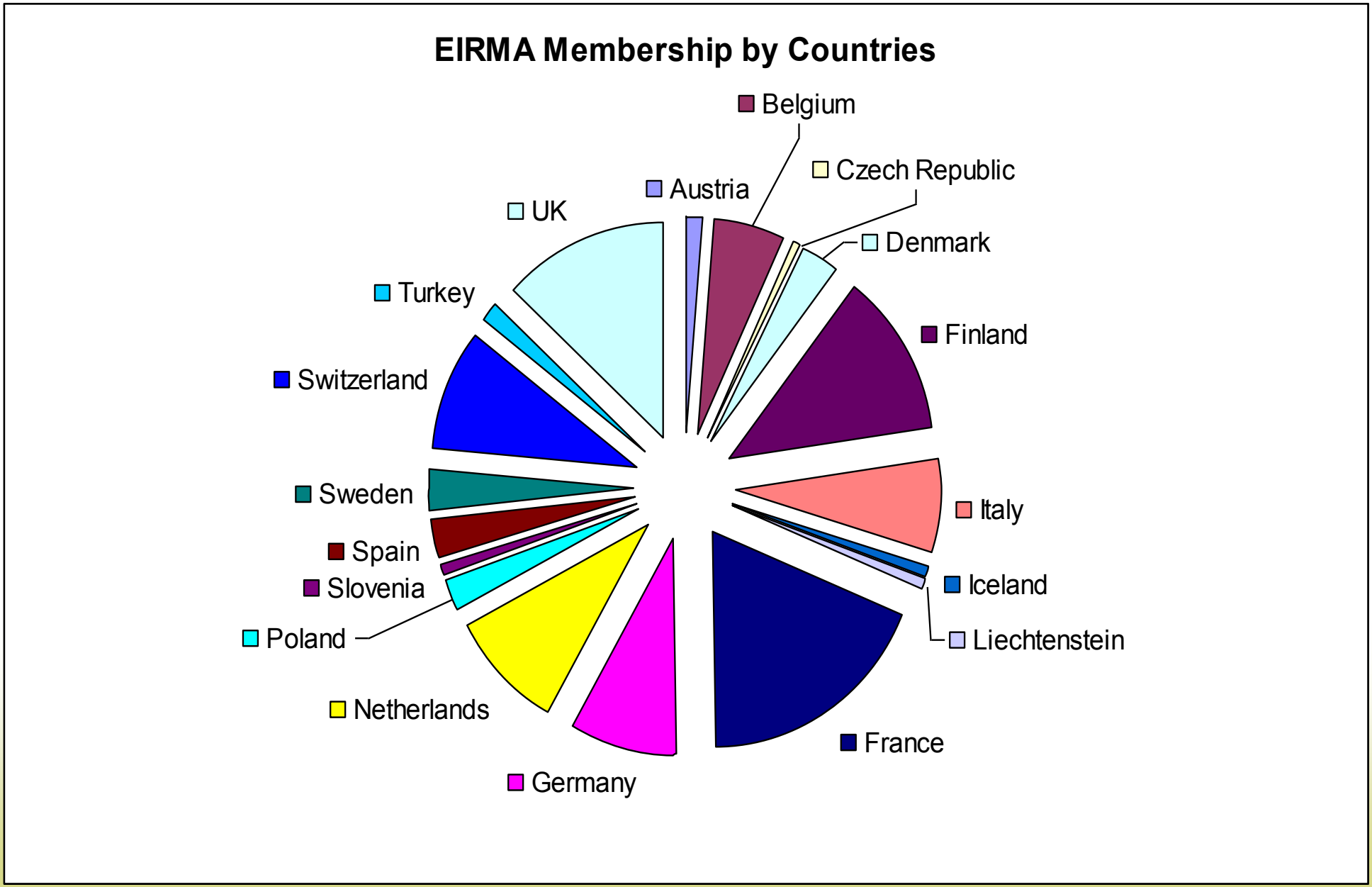
- Our focus is on helping you learn what works well and communicating this insight
- We do work with public authorities on ways to improve the environment for R&D, but it is not our job to represent the interests of specific companies

Is EIRMA a "think tank"?

Not really.

- Think tanks usually employ people to do research for others
- We concentrate on helping members to learn from each other and translate this understanding into a form that is most useful for our members.

Geographical repartition:



EIRMA Membership - Industrial Sectors