

GARR

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Welcome to the future Internet



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Future of Internet

- **Challenges, opportunities and ICT potentials**
- **Knowledge economy**
- **Expanding the role of Internet and ICT**
- **Some hints on necessary conditions**
- **The EIT experience**

A world of challenges

- Climate change
- Health and ageing
- Natural resources
- Energy
- Land use

Do we (ICT, Internet Community)
have a role?

- Pace and acceleration of technological discontinuities (singularity?)
- Two possible views

digital revolution going on
its own (remissive)

We aim at having an active role in resolving
global and local grand challenges

Technological evolution is just one factor

- industrial plans (profit-driven)
- states and policies (conditions, rules)

Noble and Opportunistic reasons

Production and service needs:

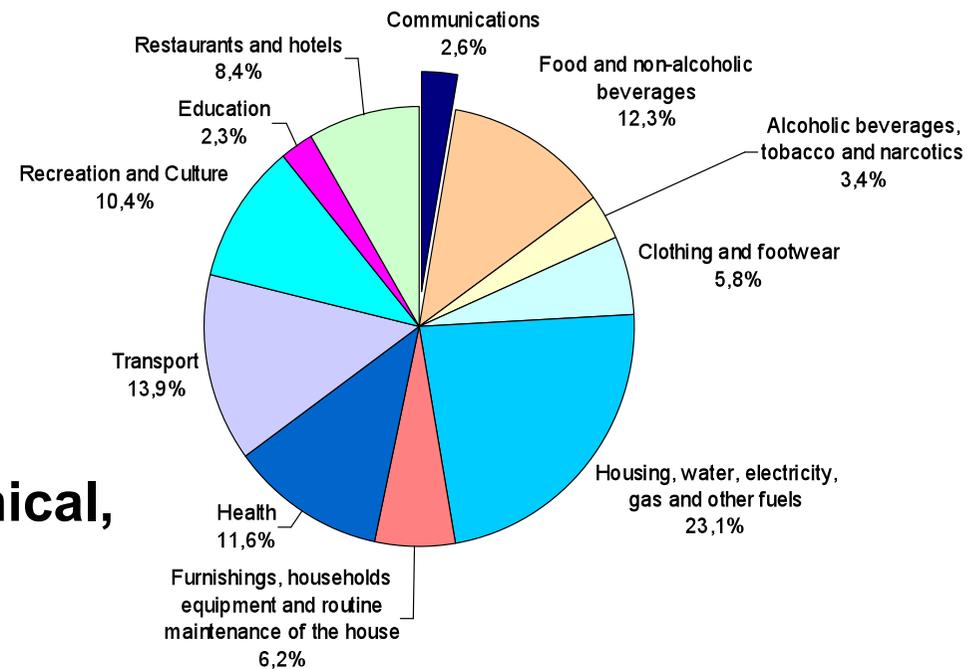
- sectors showing high elasticity to innovation (e.g. health, transport)
- sustainability conditions (economical, social, environmental)
- competitiveness



The enabling characteristics of the ICT:

- *generic attitude* (flexibility in being applied to different contexts)
- *pervasive character*
- *aggregation capacity* (assorted functions linked in new value chains)
- *connectivity* (communication and knowledge)

Consumption household expenditure in the OECD area



The *constitutive* character of ICT

Some data:

- 50% of the European productivity growth is due to ICT (80% in US)
- ICT is the basic component of the added value innovation can create in products and services (in the key sectors, 70% of the innovation produced in the last 20 years is based on ICT)



European limits due to:

- exploitation of the ICT features as *constitutive* ingredients in the process and service transformation (*soft-saving*)
- fragmentation of solutions (research and market fragmentation)
- macro economic elements (flexibility of the production factors, regulatory schemes)

“Shaping Europe’s future through ICT”

ICT as constitutive force in the title of the ISTAG report – 2006

Internet and the ICT, a multitalented strength suited to:

- **Extend** *the communication space*
- **Enable** *new value chains to take place in the overlay dimension*
- **Embed** *essential features in process innovation*
- **Envisage** *potential solutions for anticipatory development steps*



a growing-up perspective for ICT:

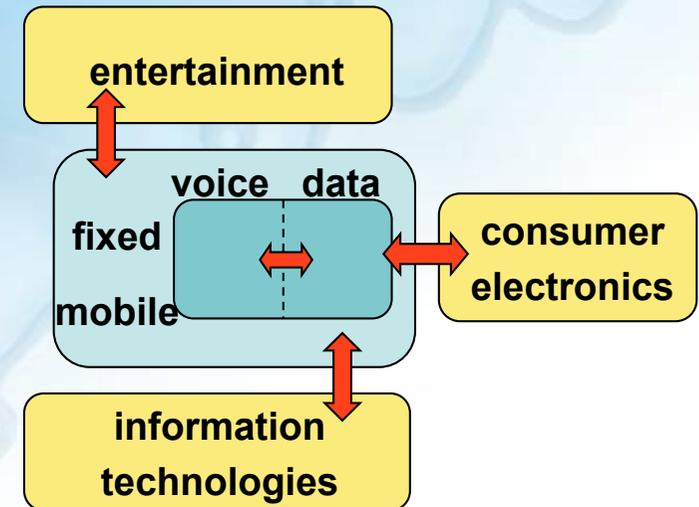
from self-sufficient force to system-level catalyst

The *extended* communication space

the digital blend

New communication models and new perspectives:

- media cross fertilisation (e.g. broadband, broadcast, content industry)
- cellular-wireless access evolution along the (smart) terminals culture
- economical sustainability of emerging models
- appropriate and innovation-aware regulatory schemes

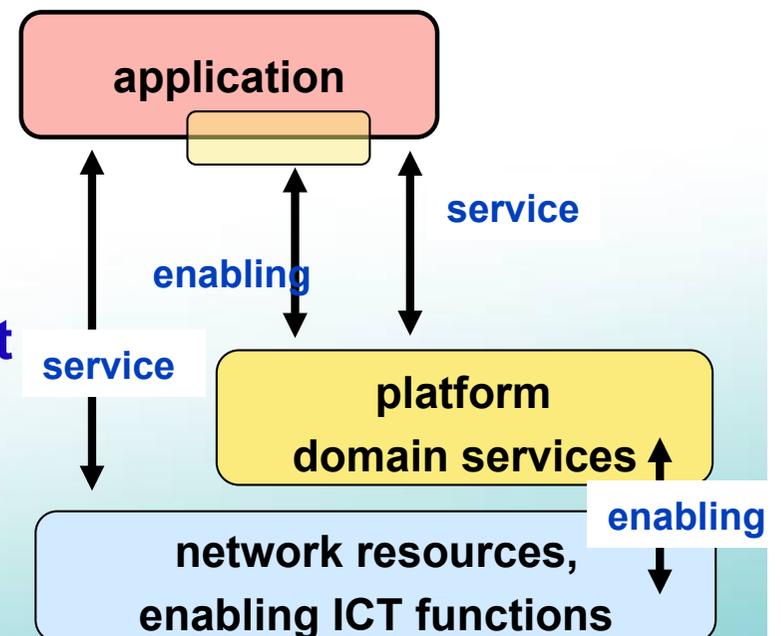


The *enabling* dimension

common functions at marginal costs for new value chains

New entrepreneurs for new business opportunities by exploring:

- innovative value chains based on the openness paradigms at terminal and network level
- social networking models and the effects on economy
- impact on social challenges and relevant remuneration mechanisms



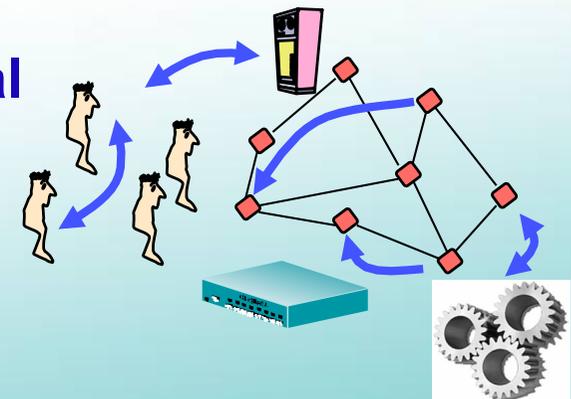
The *embedded* nature

the constitutive character of generic technologies

Innovation in *non-ICT* sectors under sustainability

criteria to support:

- sustainable conversion of product and service processes through co-operation, open innovation, context-awareness
- European policies (e.g. 20, 20, 20; lead markets, Innovation program)
- non-technological research, including social benefits and collective fall-out

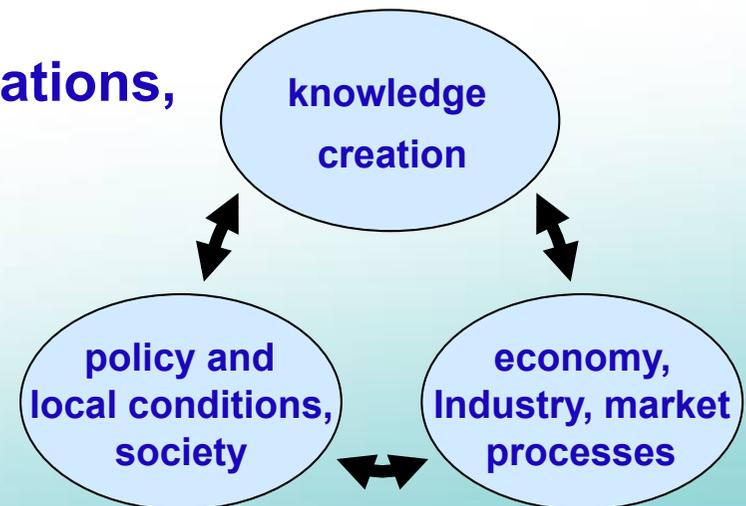


ICT as knowledge-creation tool

modelling expectation to create meaning in knowledge economy

The *extended* function of Internet and the ICT:

- promote communication and interaction between the three dynamics of knowledge economy (Research, Industry, Public policy)
- reconcile local and global dimensions
- model the emerging business configurations, key success factors and measure induced benefits



Some thoughts about *expectation*

Rosen (biologist and mathematician) and the anticipatory model

Rosen defined as *anticipatory* a system which incorporates a representation (model) of itself.



An anticipatory system can:

- **modify its parameters (by using the internal model)**
- **evaluate a number of its possible representations (in the future)**
- ...
- **by adopting two different evolutionary clocks**

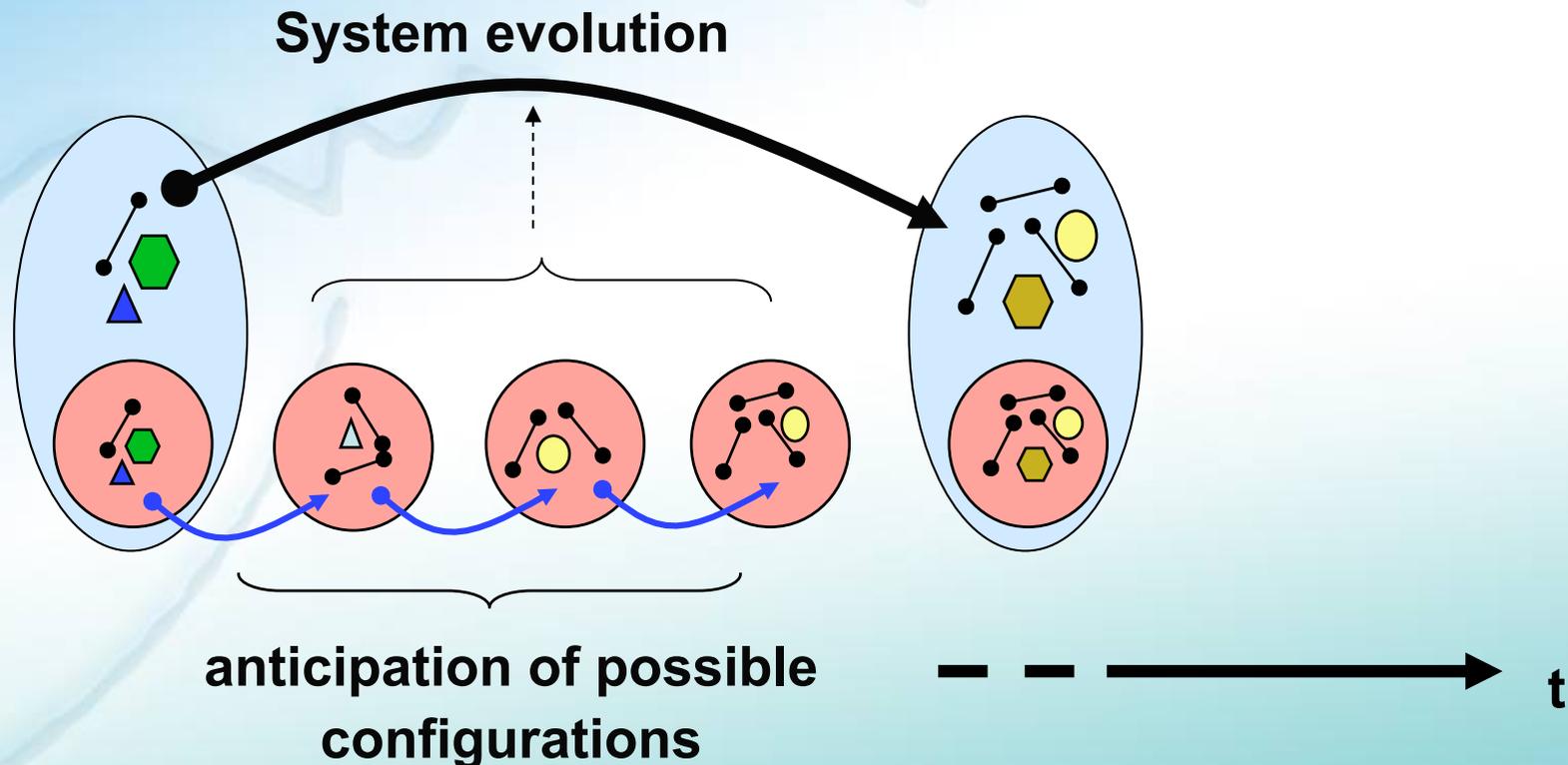
$$x(t) = a \cdot x(t-1) \cdot (1 - x(t))$$

recursion or incursion

Anticipatory systems in biology

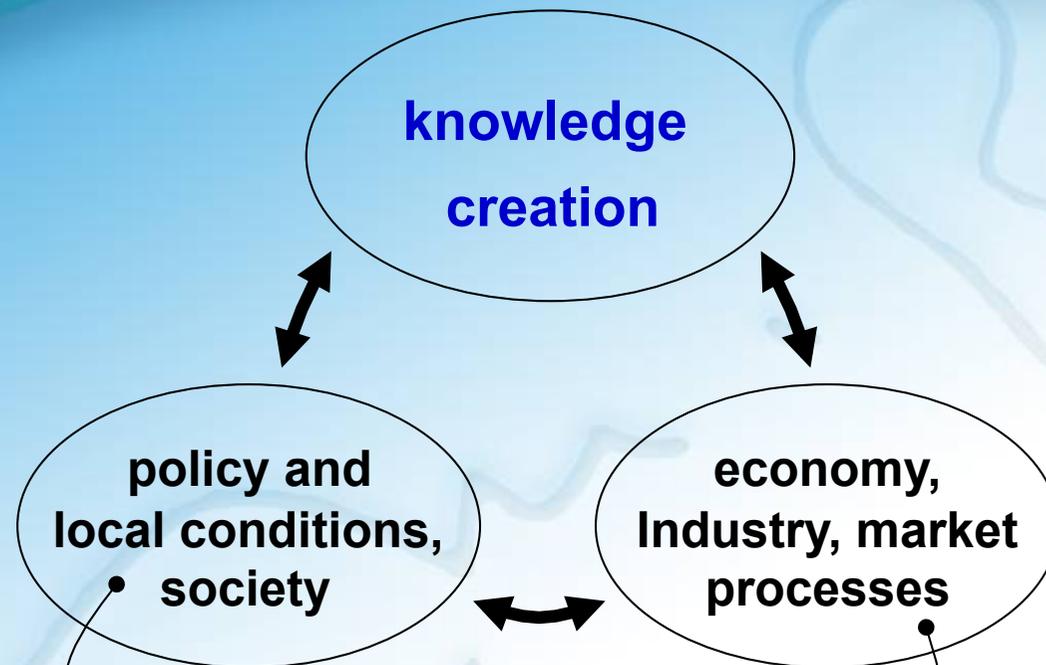
To represent the evolution of a biological system, the *anticipation* of possible future configurations can be inspired by:

- system-external factors (phenotype)
- system-internal factors (genotype)



Dynamics in knowledge economy

ICT and knowledge creation



local abilities and infrastructures, implementation, social interaction

sustainable business models

knowledge dimensions are embedded in the overall social dynamics (economy, policy, local conditions) (°).

(°) L. Leydesdorff

Knowledge economy and Sustainability

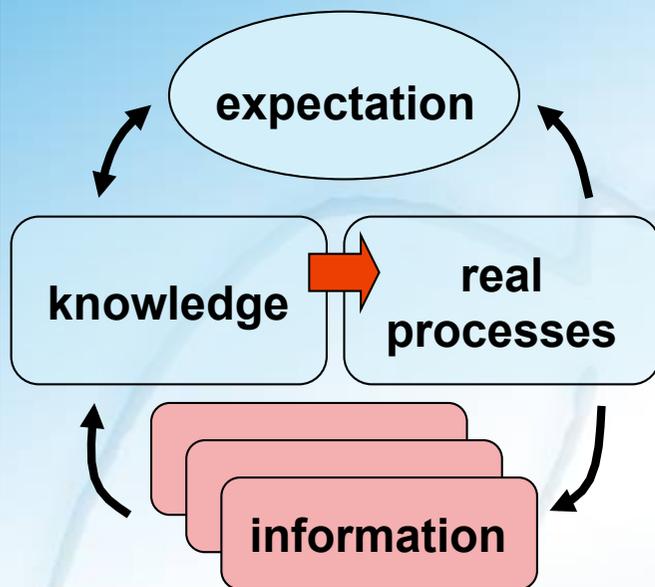
knowledge-based economy: value from available information (consolidated world) by pointing at a future perspective (expectation)

interactions taking place in real systems (re) define continuously the above perspective



expectation is key for creating *meaning* (knowledge) from the information offered by present processes

sustainable economy reflects this model

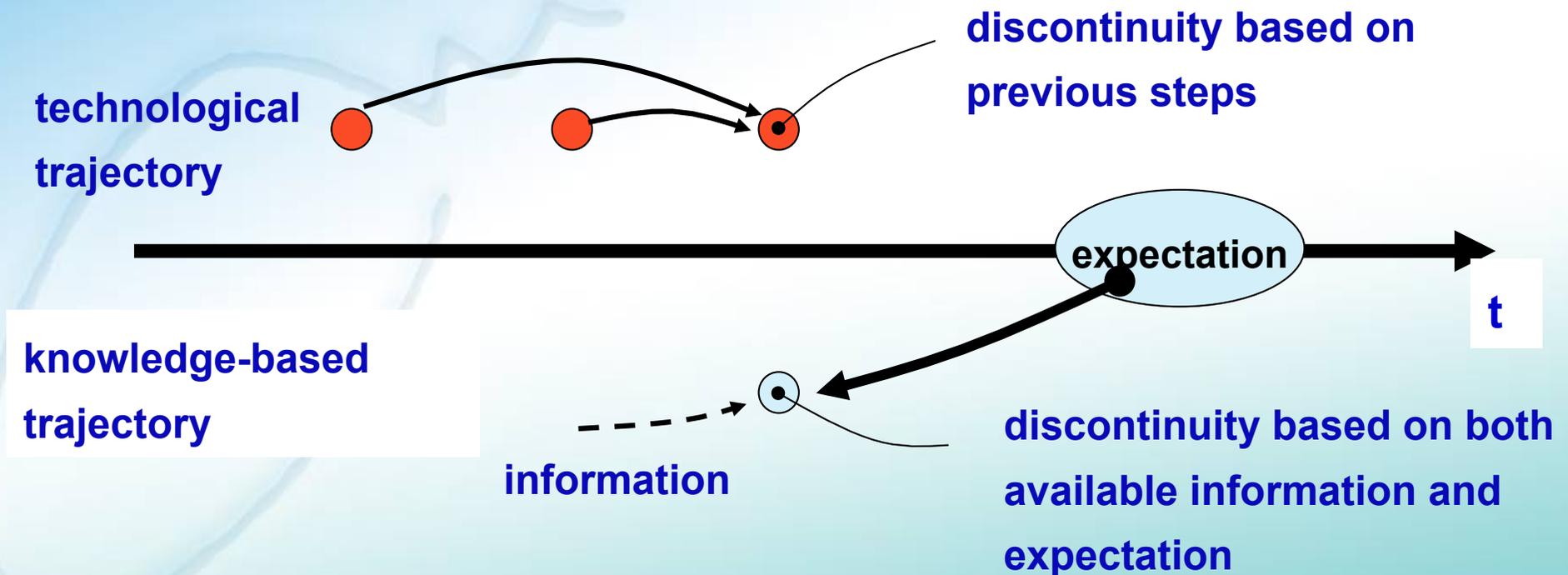


Knowledge economy

the inversion of the time arrow

The expectation (hindsight) is created through the interaction (co-evolution) of the three dynamics

Expectation is the key to give *meaning* (knowledge creation) to the information offered by the historically consolidated processes

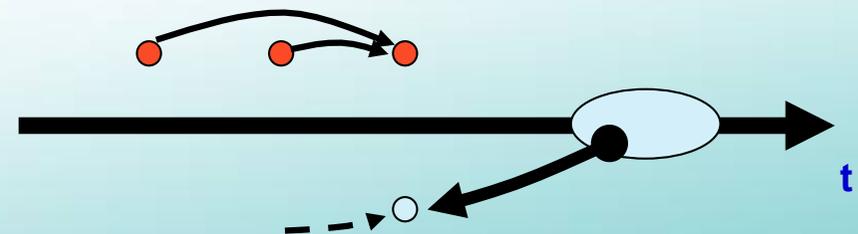


Expanding the role of ICT

in supporting the radical transformations we are facing



- The *conventional* view: ICT as basic force to rationalise existing processes – suited for transient periods; risk of weakening radical innovation opportunities; risk of a passive role for ICT
- The *knowledge-based* ICT: anticipatory force, enabling new processes and new business models – *expectation-inspired*; active role in *modelling* expectation and in *implementing* consistent processes.



How better exploit the ICT potentials



Be aware of the emerging needs and related urgency

- societal challenges (ageing, health end assistance, transport, logistics, global warming and energy)
- polarisation towards a sustainable economy (e.g. 20%, 20%, 20%)



growing importance of:

- *system* economy
- value chains network-enabled and service models based on co-operation and connectivity value
- virtualisation of production and service processes

How better exploit the ICT potentials

A renewed role for entrepreneurship

- adopt a co-operative approach
- rely on the power of connectivity and interaction as well as on related dynamics
- use virtualisation mechanisms to optimise resources
- ... and modelling techniques to identify key success factors and to measure induced benefits

**user innovation,
open innovation**

**productive innovation
actions under uncertainty
and complexity**

How better exploit the ICT potentials

A renewed role of Research and Education

- try to challenge on *How*, but also try on *Why* an innovation step has to be adopted
- adopt a (non trivial) global view – from *technology* to *system* to *business model* to *Society* and use the *generic* power of models
- give room to curiosity, scepticism, creativity and open the view to contiguous disciplines

interdisciplinary and
cross-fertilisation

from science to *business*
from *info* to *knowledge* to
.... *wisdom*

How better exploit the ICT potentials

Work for new Research and Innovation policies



- **Public Administration:** less fragmented innovation funding; active role in *innovation procurement and early adoption*
- **Industry:** availability for the adoption of open and co-operative innovation schemes; greater value to knowledge; create collective benefit from public funding
- **University:** grater polarisation of multi disciplinary and non-technological research; new education policies (from *technology to business to Society*)

European Institute of Innovation and Technology

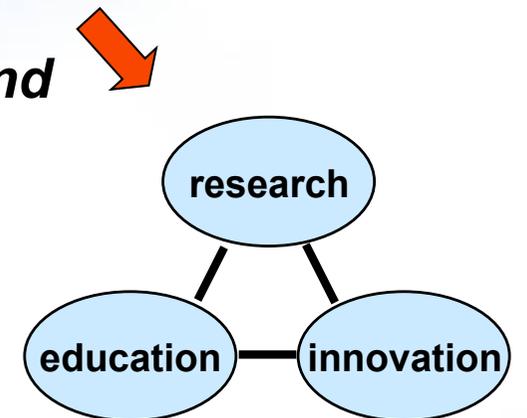
scope and KICs' objectives

Improve European competitiveness by addressing a sustainable economic growth through a stronger innovation capability and impact

• *First action (Dec. 2009) the creation of Knowledge and Innovation Communities aiming at:*

- build innovative 'webs of excellence'
- create new business
- educate and develop entrepreneurial people
- have societal impact, e.g. job creation and brain gain

- **KIC's Stakeholders:** Business, Entrepreneurs, R&D Organisations, Education, Investment Communities, Local and National Governments



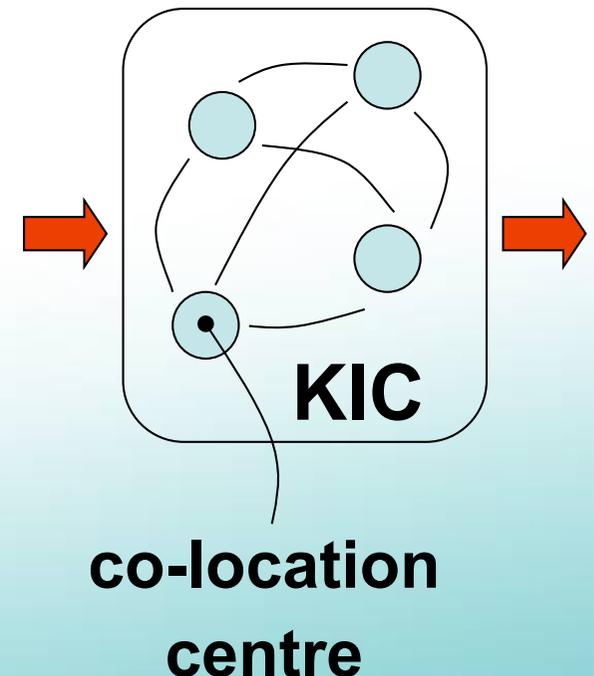
knowledge dimensions

A Knowledge and Innovation Community

- high-profile, collaborative consortium
 - a “legally and financially structured and managed entity”
 - of geographically distributed but thematically convergent stakeholders
 - open to international participation
 - **climate change and mitigation, sustainable energy and future of ICT the first acting KICs**
- aiming at becoming a world leader in its field (from education to economy)
- by creating a measurable impacts on society
 - economic, scientific, educational, entrepreneurial
- minimum life 7 years

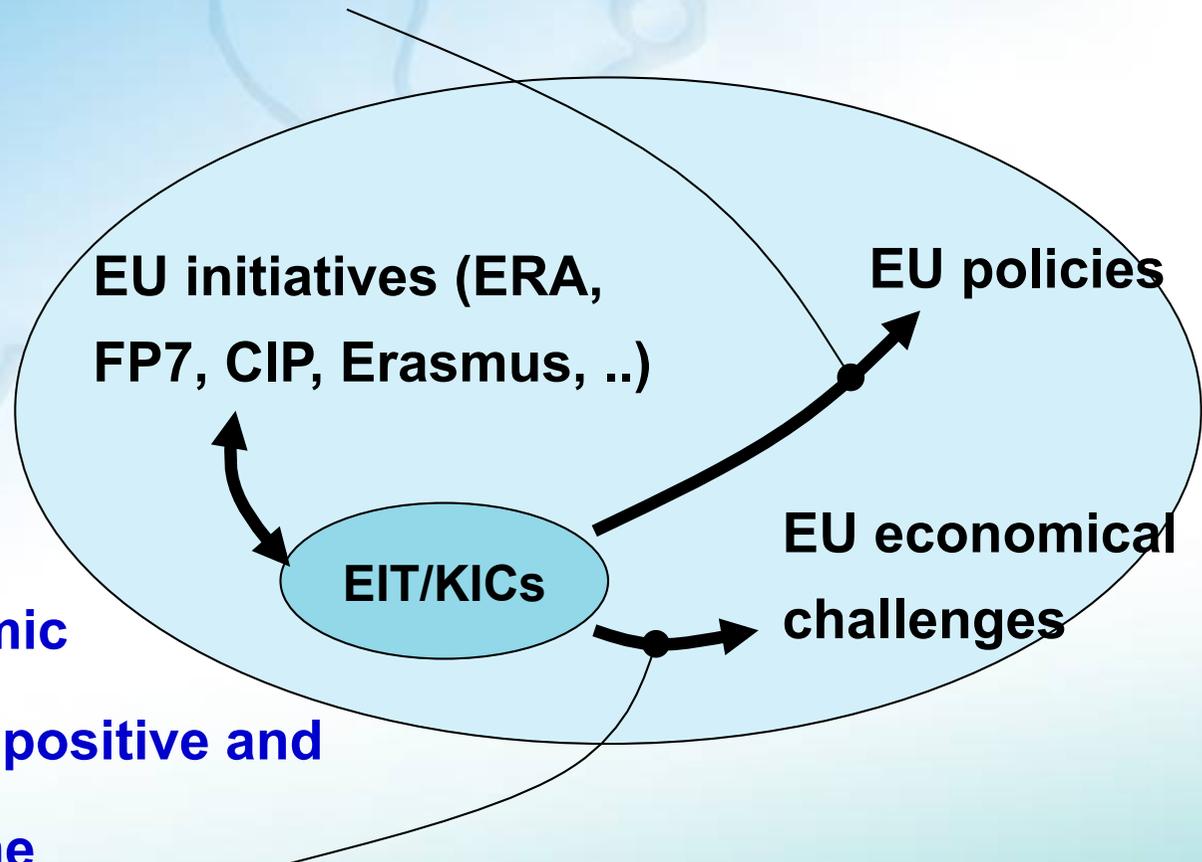
KIC – challenges for impact

- KICs = highly integrated, creative and excellence-driven, autonomous partnerships; internationally distributed but thematically convergent partners
- KIC co-location = a geographical location of a KIC where all or a large part of the innovation web can be found in close proximity working together across the innovation web
- CEO type leadership
- *A can do* attitude, stipulating empowerment and enabling people to develop new business opportunities



EIT/KICs - a double role in the EU context

- To model, experiment and disseminate new innovation, business and education approaches as a support to EU policies



- To develop new economic
- organisations having a positive and
- significant impact on the
- European innovation and societal scene