

Digital Science and its impact on Scientific Societies

European Computer Science Summit
Prague (CZ), 13 October 2010

Franco Accordino – Assistant to Director
European Commission - DG INFSO
Emerging Technologies and Infrastructures



European Commission
Information Society and Media

Summary

- Digital Science 2030 Vision
- EU policy context and first steps towards FP8
- Scientific Societies relates activities
- Conclusions

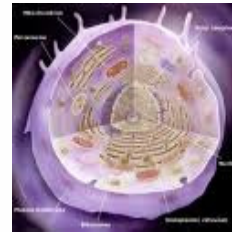


A new way of doing science...



Digital science: some examples

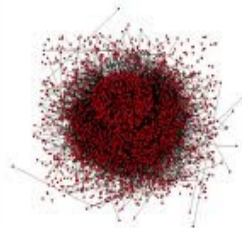
- “in silico” medicine



- “in silico” engineering



- Internet science

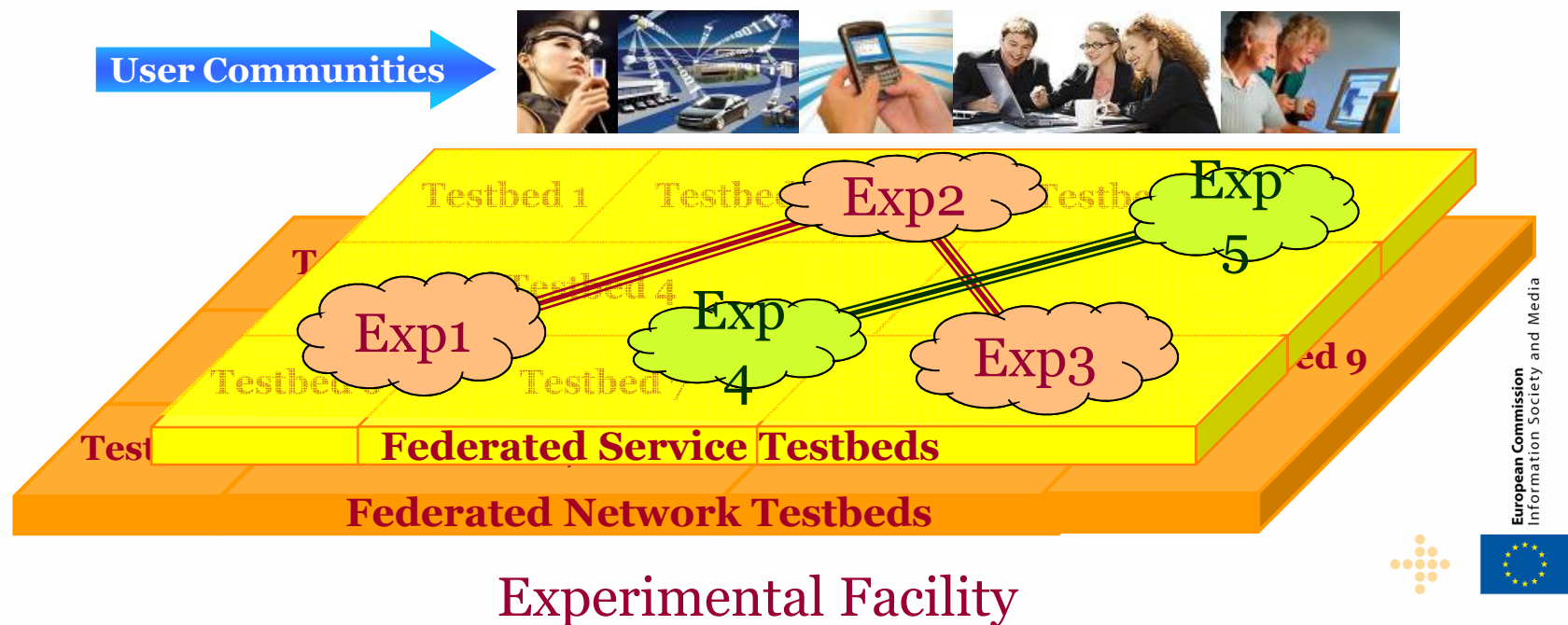


- ...



Ex.: Infrastructures for Internet Science: FIRE - FI Research & Experimentation

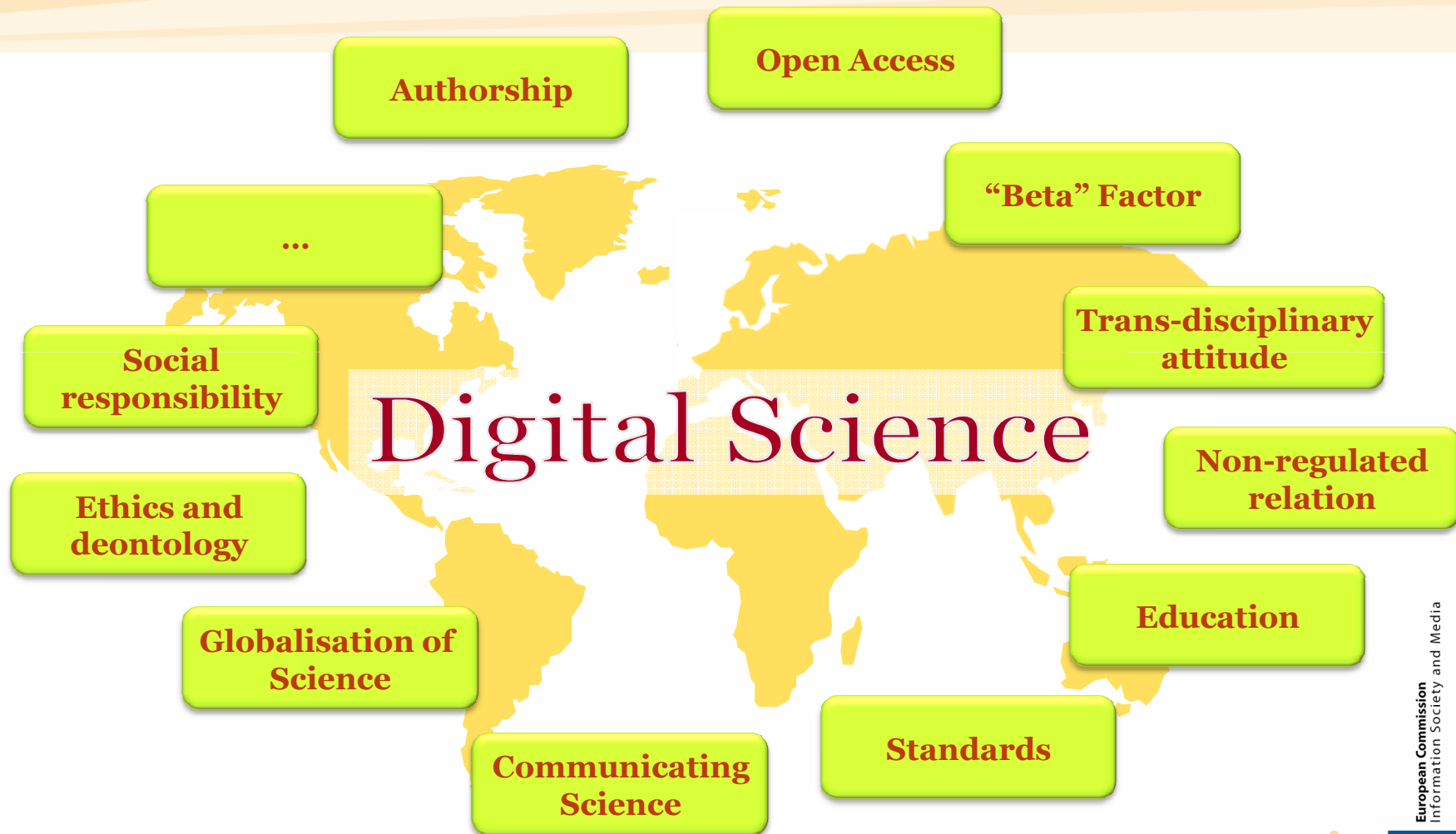
- Anticipating technology trends
- Assessing business models
- Evaluating societal impact
- User-centric development
- Experimental research
- System/holistic view



Digital Science: technology enablers

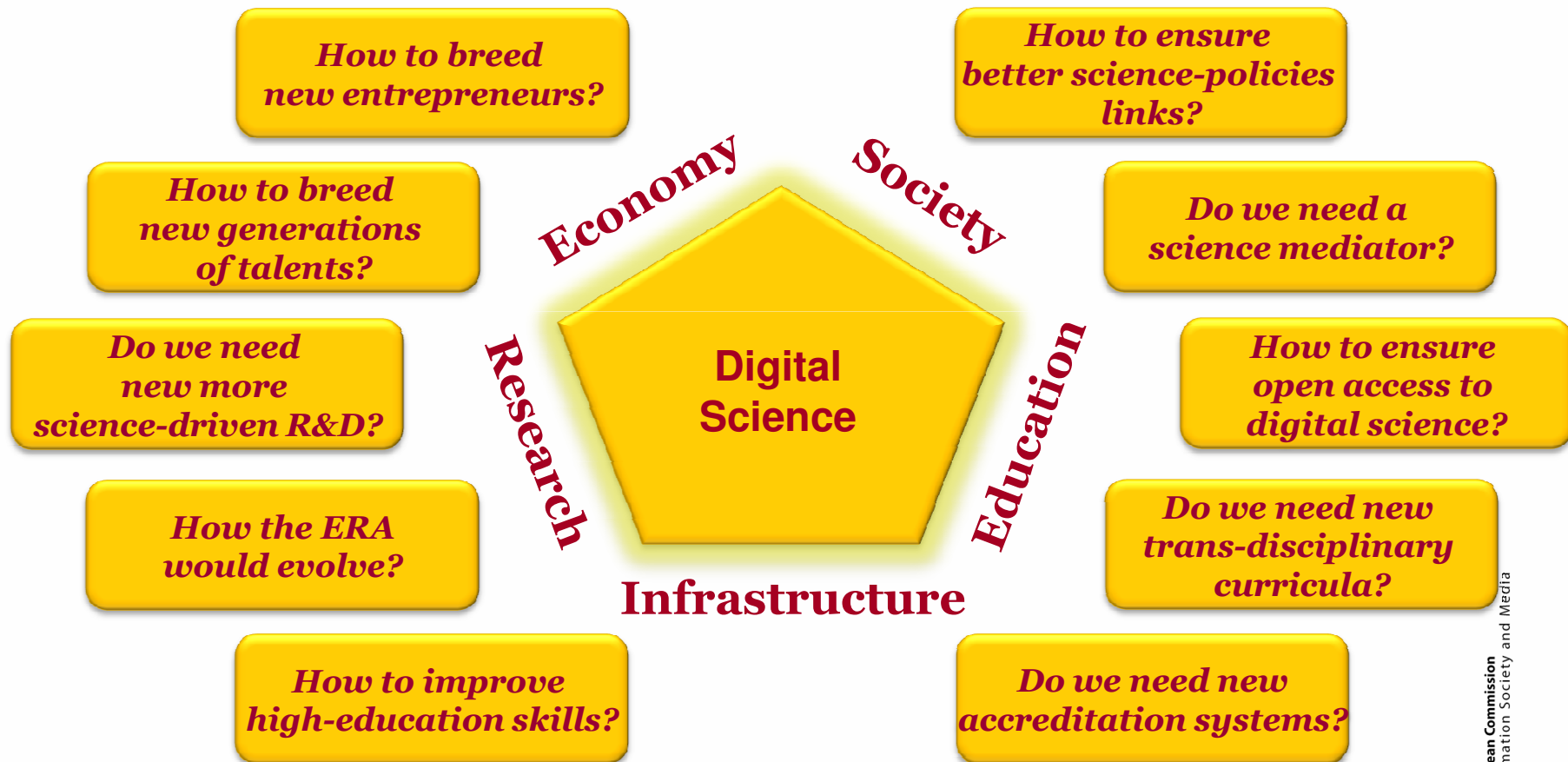


Digital Science: policy, governance...



Those aspects are at the core of the scientific societies scope

Digital Science: some questions related to scientific societies



These questions require continued reflection/consultation

Summary

- Digital Science 2030 Vision
- EU policy context and first steps towards FP8
- Scientific Societies relates activities
- Conclusions



Europe 2020: an ambitious and credible strategy

'Flagship' Initiatives

Smart growth

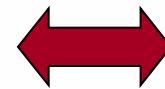
- 1) Innovation Union
- 2) "Youth on the move"
- 3) Digital Agenda

Sustainable growth

- 4) "Resource efficient Europe"
- 5) Global industrial policy

Inclusive growth

- 6) New skills and jobs
- 7) Fighting poverty



**Scientific
Societies**

ICT scientific societies encompass a variety of aspects that are altogether relevant to achieve the ambitious objectives set under several Europe 2020 Flagships. This stems also from the pervasiveness of ICT.



Digital Agenda for Europe

Single Market

**Research &
Innovation**



“Fibre”
Europe

**Openness &
interoperability**



**Digital
Skills**

Sustainable
services &
applications



**Trust &
Security**



Some relevant ICT Research and Innovation actions

- **By 2020, EU and MS to double annual total public spending on ICT research and development**
 - From €5.5bn to €11bn (including EU programmes),
 - Leverage an equivalent increase in private spending from € 35 billion to € 70 billion;
- **Leverage more private investments (PPP, PCP,...)**
 - +20 annual increase by 2013
- **Ensure 'light and fast' access to EU research funds (SMEs, Young researchers)**
- ...



Some relevant Digital Skills actions

The EU economy is hampered by a shortage of ICT practitioner skills: Europe could lack the skills to fill as many as 700,000 IT jobs by 2015

- **Propose digital literacy and competences as a priority for the European Social Fund regulation (2014-2020);**
- **By 2012, develop tools to identify and recognize the competences of ICT practitioners, linked to the European Qualifications Framework and to EUROPASS**
- **By 2012, develop a European Framework for ICT Professionalism to increase the competences and the mobility of ICT practitioners across Europe**
- **...**



Some relevant “Youth on the Move” actions

- **Support the reform and modernisation of higher education, by presenting a Communication (2011), which will set out a new reinforced agenda for higher education:** This will focus on strengthening the employability of graduates, encouraging mobility, including between academia and industry, promoting transparent and high quality information on study and research possibilities and the performance of institutions.
- **Benchmark higher education performance and educational outcomes:** The Commission will present the results of a feasibility study in 2011, to develop a multi-dimensional global university ranking system, taking into account the diversity of higher education institutions.
- **Propose a multiannual Strategic Innovation Agenda (2011), defining the role of the EIT** in Europe’s multi-polar innovation context and laying down priorities for higher education, research, innovation and entrepreneurship over the next seven years.
- ...



R&D&I: Policy timetable (tentative)

September 2010	Adoption of Innovation Union Flagship
3Q 2010	Budget review of current financial framework - Limited scope
April/May 2011	Commission proposal for next financial perspectives - Weight of R&D&I in EU budget
July 2011	Communication on R&D and innovation (incl. ERA)? - Setting the scene for FP8 and CIP II
End of 2011	Legislative proposals for FP8, CIP II, TENs etc.
Mid 2012	Adoption WP2013 of ICT in FP7 (1.5 M€ of budget)
End 2012	Adoption of MAFF by Council and Parliament
2013	Adoption of the individual programmes
1 January 2014	Start of new programmes



Summary

- Digital Science 2030 Vision
- EU policy context and first steps towards FP8
- Scientific Societies relates activities
- Conclusions



Scientific Societies activities

- Scientific Societies reflection revamped in the past two-three years
- Consultations made in 2008-2010
 - Workshop in Lyon (ICT 2008) => report
 - Networking session organised in Brussels (ICT 2010)
- A study has been launched and is still ongoing
- Scope of Scientific Societies is becoming even more relevant in the light of recent policy developments (Europe 2020, DAE, YoM)



Lyon workshop's findings: a fragmented landscape

- Geographical scope (National, European, International)
- Scientific and technological scope
- Activities
 - communication and dissemination, publishing, events, prizes and awards,...
 - education, learning, skill development (schools, curricula,...)
 - accreditation, professional certification
 - standardisation, knowledge transfer
 - R&D or coordination of R&D
 - exploitation of technology
 - policy making
 - ...
- Legal form (members are associations, individuals, ...)
- Business/sustainability models



Lyon workshop's findings: desired principles

- Independence from political or commercial interests
- Based on individual membership of scientists and professionals
- Governed democratically by its members
- Leadership which is recognised by top scientists and practitioners
- Scientific and professional excellence
- Value European diversity of scientific cultures and approaches
- Conclusions:
 - Unanimous opinion that a EU-rooted scientific society would be desirable, BUT
 - Divergence of views as to the 'how', 'when', as well as on the 'what'

Contributions by: Informatics Europe, ERCIM, EAI, CEPIS, EATCS, ETSI,...



Study SMART 2009/0061, “ Role and Impact of Professional and Scientific Societies in ICT research, Education and Innovation ” (May '10 - January '11?)

Objectives:

- Stocktaking of ICT societies (scientific domain, tasks, geographical scope, legal forms and sustainability models)
- Qualitative & quantitative assessment of the actual contribution (R&D skills, standards, dissemination, take-up of results, innovation,...)
- Understanding impact of 2.0 paradigms
- Survey actual perception of EU stakeholders
- Identify strategy, including future needs and options for action

- Online questionnaire still ongoing
- Study's workshop on 25th and 26th November 2010
- More info: <http://www.ictsocieties.org/>



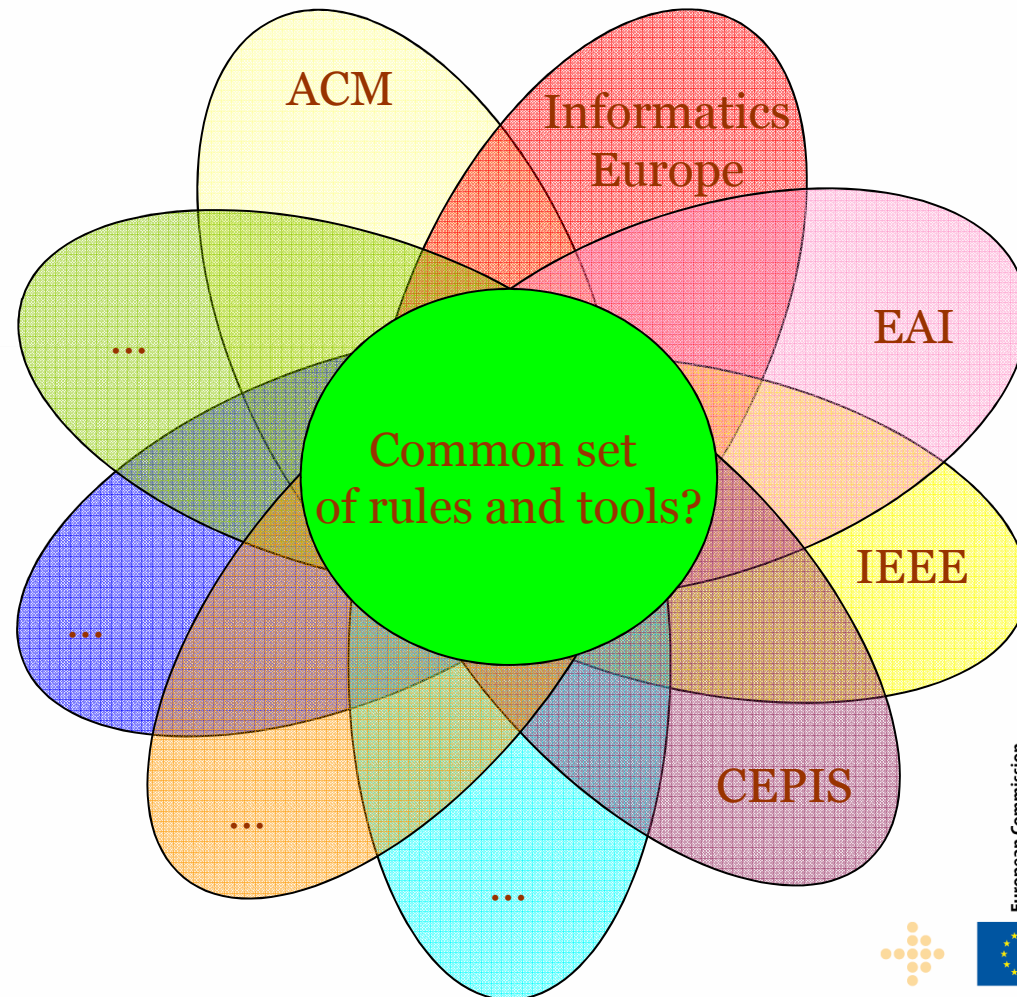
Summary

- Digital Science 2030 Vision
- EU policy context and first steps towards FP8
- Scientific Societies relates activities
- Conclusions



Scientific Societies: new global structures needed?

- Which form?
- Which mandate?
- Under which 'umbrella'?
- Which shared rules and tools?
- Sustainability?
- How they would differ from existing organizations?

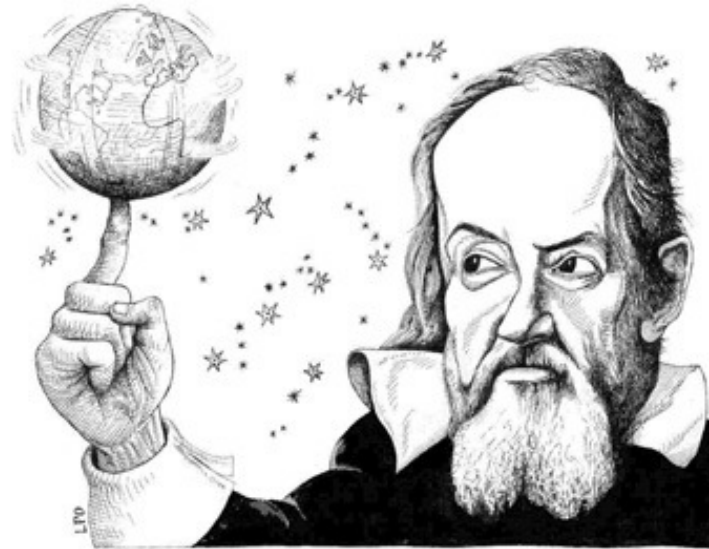


Conclusions

- Scientific societies are an important reality in Europe
- Need to overcome fragmentation and to strengthen the links between education, research and innovation
- New EU policy context provides considerable opportunities for European scientific societies to contribute
- We kicked-off a process. What other actions could follow?
- Your input is essential to define the way forward



Thanks



“...and yet it moves ...”

Galileo Galilei, physicist,
mathematician and philosopher
Pisa, 15 Feb 1564 – 8 Jan 1642



ICT sector and R&D today

- **ICT responsible for 50% of productivity growth**
 - Underpins innovation in all sectors and enables to address major social challenges
- **EU ICT market: 660 b€**
 - First in the world (~34% of total) vs. 23% EU supply
 - 4% grow vs. 7%
- **R&D investments: 17% of total (29% in US)**
 - 37b€/y (88b€/y in US)
 - Weak and fragmented public support (5.5b€/y)
 - Lack of culture of private investments
 - Slow adoption of R&D results



FET research scheme is unique *by combining the following characteristics*

- **Foundational**
New foundations for future ICT by exploring new unconventional ideas and scientific paradigms
- **Transformative**
Driven by ideas that challenge and can radically change our understanding of scientific concepts behind existing ITs
- **High risk, high pay-off**
Balances risks against high potential returns and the chance of revolutionary breakthroughs
- **Purpose-driven**
Impact on future industrial ICT research agendas
- **Multidisciplinary**
Synergies with and cross-fertilization between disciplines
- **Collaborative**
Best teams in Europe and increasingly worldwide



FET Policy background



••• Future and Emerging Technologies

2009 / 04 COM (2009) 184 'Moving the ICT frontiers'
Strengthening FET through more resources and new initiatives

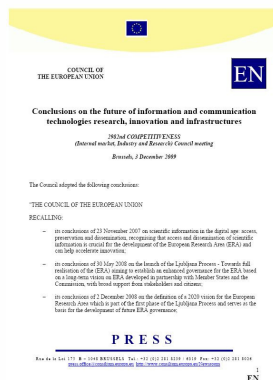
- FET Open and FET proactive strengthened
- FET Flagship initiatives
- High-Tech Research Intensive SMEs
- Young Researchers
- International cooperation

2009 / 10 ISTAG report

on „Improving the reach, effectiveness and impact of FET“



October 2009



2009 / 12 endorsed at The COMP Council





FET Flagship Rationale

- **Unifying efforts around an ambitious long-term scientific goal is indispensable in building up critical mass to meet key scientific challenges of the 21st Century**
- **There are a number of areas where foundational research is strong in Europe, but fragmented and needs to be brought together to accomplish such challenges**
- **A need for large-scale, focused and sustained support**





FET Flagship Concept

**Driven by unifying goal • Multidisciplinary • Long-term
Foundational • Collaborative
research initiatives
Targeting a visionary S&T breakthrough**

- Able to **generate waves of technological innovation**, with significant impacts on economy and society
- Due to size and level of ambition, **possible only via federated effort** of the European Framework and National research programmes
- Flagships may become a new instrument for shaping ERA

Criteria*:
Ambition, Impact, Integration, Plausibility

** Based on recommendations of the ISTAG report, and currently under refinement*





Key Milestones of FET Flagships

- 2010 Q2** **Setup of FET Flagship Science Forum and the National ICT Directors' WG**
- 2010 / 06** **First joint scientific / policy event (9/10 June)**
- 2010 / 07** **Launch of a competitive call** to support comprehensive FET Flagship Initiative Preparatory Actions
> 10M€ to support 5-7 flagship Preparatory Actions
- 2010-2012** **Preparation of implementation framework**
- 2011** **FET Flagship Preparatory Actions:** design & feasibility; establishing high-potential candidates
- 2012** **Selection of FET Flagships**
- 2013** **Launch of first FET Flagships**



Objective ICT-2011.9.5 – Call FET-F FET Flagship Initiative Preparatory Actions

- a) Complete design and description of a consolidated candidate FET Flagship Initiative, including assessment of feasibility in scientific, technical and financial terms, to enable the launch of a FET Flagship by 2013.

Objective: 5-6 projects, max 12 months

- b) Provide support to the setup of candidate FET Flagships by coordination of common issues, e.g. establishment of common platforms to tackle frequent tasks or shared interests, promoting networking and structuring of communities, organisation of joint events etc.

Objective: 1 project, ca. EUR 1 million

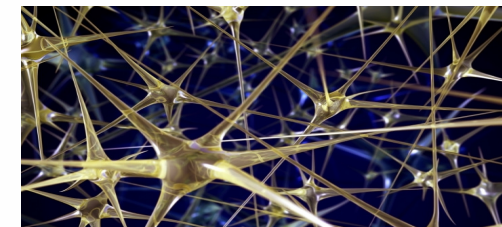
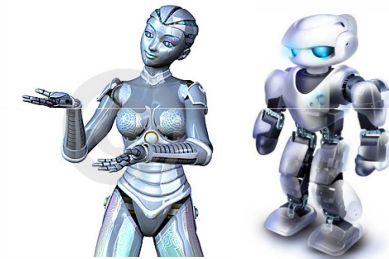
Scope & objectives:

- well-defined & **justified goal**
- **implementation roadmap**, operational mech.
- assessment of **feasibility** (scientific, technical, financial and capacity)
- **commitment from key stakeholders** (incl. alignment of research agendas & resources)



Preliminary ideas for Flagships (online consultation – status April 2010)

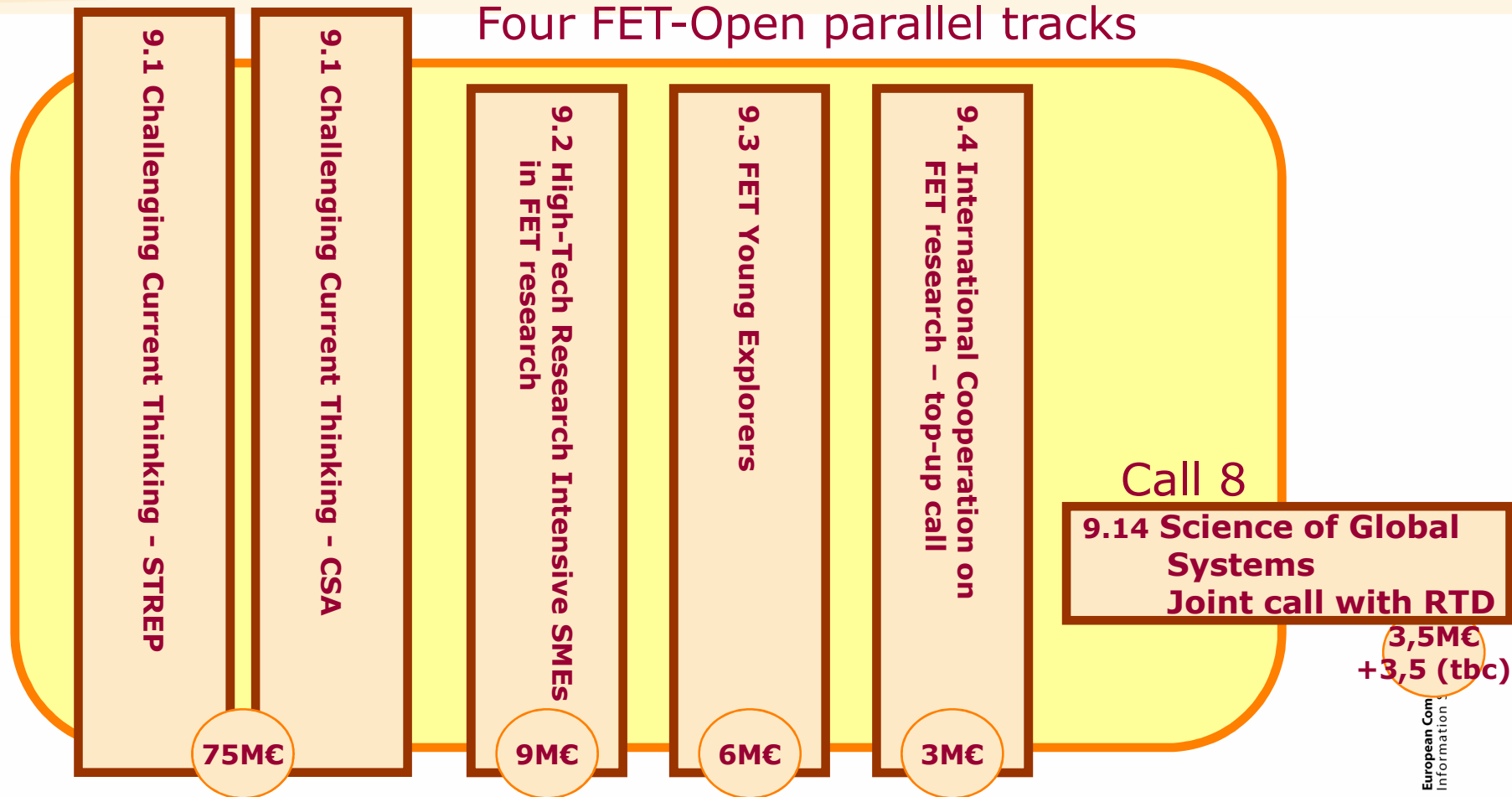
- a) **The FuturICT Knowledge Accelerator: Unleashing the Power of Information for a Sustainable Future**
- b) **World Society Modeller (S-GAIA)**
- c) **The Social Computer**
- d) **Design, construction and Operation of a Neuromorphic Computation Facility**
- e) **Virtual Physiological Human (VPH) Infostructure**
- f) **Internet Science**
- g) **Towards a theory of the evolution of the Web**
- h) **Transforming Production for the 21st Century**
- i) **Robot Companions for Citizens**
- j) **SoundICTs: Endowing human auditory capacities and embodying audition faculties into artificial systems**
- k) **ICT Beyond Limits**
- l) **Towards Augmented Humanity: Tuning Bionic Man**
- m) **Designing a Life Capsule with Bio-Engineering Ontologies**
- n) **Coevolutionary Interfaces: Change towards strong sustainable development**
- o) **Using evolution to compute**
- p) **Simulating the Human Brain**
- q) **Life care through ICT**
- r) **Transforming medical education with immersive Virtual Clinical Environments**
- s) **Simplicity in ICT**
- t) **Beyond users. Human as decision makers in IT**
- u) **NGN & NGN New Generation Network for New Governance Network**
- v) **Transforming Modelling and Simulation for European Growth**
- w) **Living Technology: Exploiting Life's Principles for ICT**
- x) **Integral Biomathics: a New Era of Biological Computation**
- y) **Computational socio-genomics**
- z) **Ubiquitous Complex Event Processing (U-CEP)**



FET Open – WP 2011-2012

*Incubator for radically new research ideas
and future research and innovation potential*

Four FET-Open parallel tracks



FET-Open

ICT-2011.9.1: Challenging current thinking

- CSAs

What are we looking for ?

- CSAs for creating the best conditions within which FET research can flourish and achieve transformative impacts that it aspires to. These activities may be, for example:
 - actions, including networking and dissemination activities, aiming at the **emergence of new research communities and collaborations** involving a broad diversity of disciplines and actors into FET research
 - actions towards the increased involvement **high-tech research intensive SMEs**
 - actions that stimulate excellence and future leadership of **pioneering teams of Young Researchers**
 - actions aiming to strengthen the **international dimension** of FET
 - Up to 7.5 M€ for CSA
 - 1-step submission and evaluation scheme
 - proposals continuously receivable until 12 March 2013

