

Call title: ICT call 5
Call identifier: FP7- ICT -2009-5

WP 2009-2010 Call 5

- **Date of publication: 31 July 2009**
- **Deadline: 3 November 2009**
- **Indicative budget: EUR 722 million**



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* Slides and general information are provided by the Commission, but selected by me.



Challenge 1 and the Future Internet

NETWORK

Cognitive Radio,
Spectrum
Management,
B3G..

Converged and
Optical
Networks

Future Internet
Architectures
and
Technologies

SERVICES

Service,
Software
Engineering

Future Internet
Service
architectures
and Platforms

ENTREPRISES / ORGANISATIONS

Enter-
prise
Environ-
ments

Internet
of
Things
Apps

Internet of
Things

MEDIA AV

Beyond HDTV
and e_Cinema

Content aware
Nets, Net aware
Apps.

Networked
Search

3D and Media
Internet

Experimental Facilities + Experimentally Driven research

Trustworthy Networks + Trustworthy Services

Tools and technologies for Trust



Challenge	Objectives	Funding schemes ⁴³
Challenge 1: Pervasive and Trusted Network and Service Infrastructures	ICT 2009.1.1 The Network of the Future (call 5)	CP, NoE, CSA
	ICT 2009.1.2 Internet of Services, Software & virtualisation	CP, CSA
	ICT 2009.1.3 Internet of Things and enterprise environments	CP, CSA
	ICT 2009.1.4 Trustworthy ICT	CP, NoE, CSA
	ICT 2009.1.6 Future Internet Experimental Facility and Experimentally-driven Research	CP, CSA



Challenge 3: Components, systems, engineering	ICT 2009.3.1 Nanoelectronics Technology	CP, NoE, CSA
	ICT 2009.3.5 Engineering of Networked Monitoring and Control Systems	CP, NoE, CSA
	ICT 2009.3.7 Photonics	CP, CSA
	ICT 2009.3.9 Microsystems and Smart Miniaturised Systems	CP, CSA



Challenge 4: Digital Libraries and Content	ICT 2009.4.2 Technology-Enhanced Learning	CP, NoE, CSA
	ICT 2009.4.3 Intelligent information management	CP, NoE, CSA



Future and emerging technologies	ICT 2009.8.4 Human-Computer Confluence	CP (IP only)
	ICT 2009.8.5 Self-Awareness in Autonomic Systems	CP
	ICT 2009.8.6 Towards Zero-Power ICT	CP (STREP only)
	ICT 2009.8.9 Coordinating Communities, Plans and Actions in FET Proactive Initiatives	CSA
	ICT 2009.8.10 Identifying new research topics, Assessing emerging global S&T trends in ICT for future FET Proactive initiatives	CSA



Horizontal support actions	ICT 2009.9.2 Supplements to support International Cooperation between ongoing projects	CP
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Objective 1.1: The Network of the Future

WP 2009-2010 Call 5



Outline

- **Work Programme 2009/2010 Overview**
- Objective 1.1
- Call 5
- Proposal Strategies



Where do we stand?

- Launched:
 - FP7 ICT Call 1 for proposals in 2007-08
 - ~200 M€ of EU funding,
 - 46 projects funded
 - *Out of 173 proposals received*
- Ahead of us
 - WP 2009-10 Objective 1.1: ~190 M€ funding
 - Call 4 ~110 M€ funding
 - Call 5 ~80 M€ funding

WP 2009-10: Main principles

- Projects launched in 2009-10 to have **Impact in 2015-20:**
- Target: Research with Industrial Output (pre-competitive)
 - *Curiosity-driven research -> FET*
 - Solution Exploration -> challenge 1
 - Prototyping -> challenge 1

Research challenges should:

- Encourage firms to explore more innovative options than they would pursue otherwise
- Focus on higher-risk ICT collaborative research in a medium to long-term agenda



Enabling Europe to shape and master the 2015-20 ICT landscape

In WP 2009-10 are three major technology and socio-economic transformations that Europe should lead:

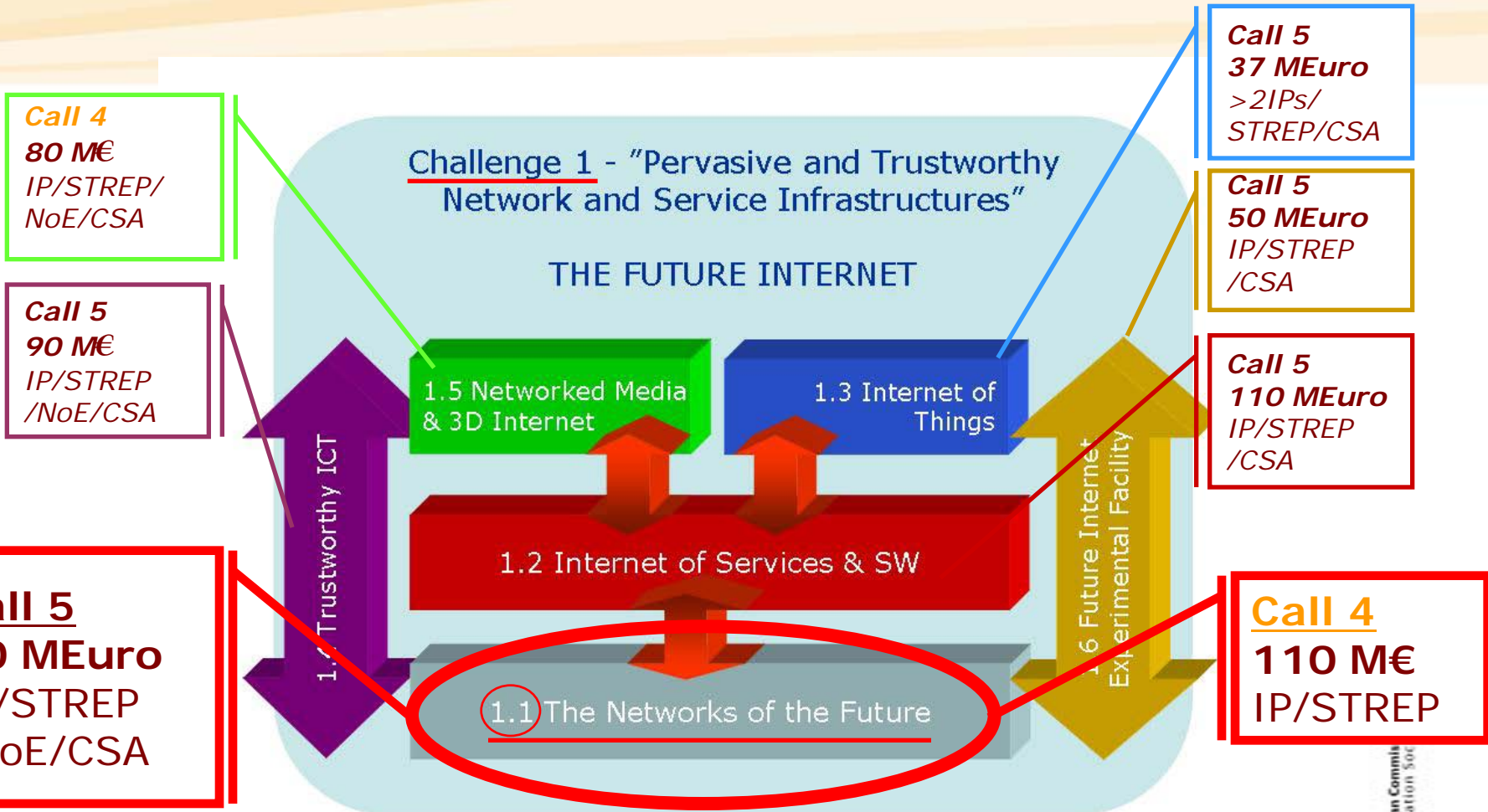
- **Future Internet (FI)**
- Alternative paths to ICT components and systems
- ICT for sustainable development

In addition, main drivers mid-to-long term for ICT research priorities remain valid:

- 'more for less' - more functionality and performance at lower cost
- scalability, adaptability and learning capabilities
- reliability and security



Pervasive and Trustworthy Network and Service Infrastructures Σ 557 M€



Funding schemes in Objective 1.1

- Collaborative projects (CP):
 - **STREP**: 'small or medium-scale focused research actions'
 - **IP**: 'large-scale integrating projects' (IP)
- Network of Excellence (NoE)
- Coordination and Support Action (CSA)
- Objective is to support a balanced portfolio:
 - Focused and agile scientific and technological exploration through STREP's
 - Concentration of efforts - where needed - through IP's
 - Support Actions and NoE's: **only in call 5**
- Budget per call per instrument in Objective 1.1:

€ Million	IP	STREP	NoE	CSA	Total
Call 4	Min 55	Min 33	-	-	110 €
Call 5	Min 35,5	Min 21,3	6	3	80 €

Objective 1.1 The Network of the Future

- **Future Internet Architectures and Network Technologies**
 - Novel Internet architectures and technologies
 - Flexible and cognitive network management and operation frameworks
- **Spectrum-efficient radio access to Future Networks**
 - Next-generation mobile radio technologies
 - Cognitive radio and network technologies
 - Novel radio network architectures
- **Converged infrastructures in support of Future Networks**
 - Ultra high capacity optical transport/access networks
 - Converged service capability across heterogeneous access

Objective 1.1 The Network of the Future

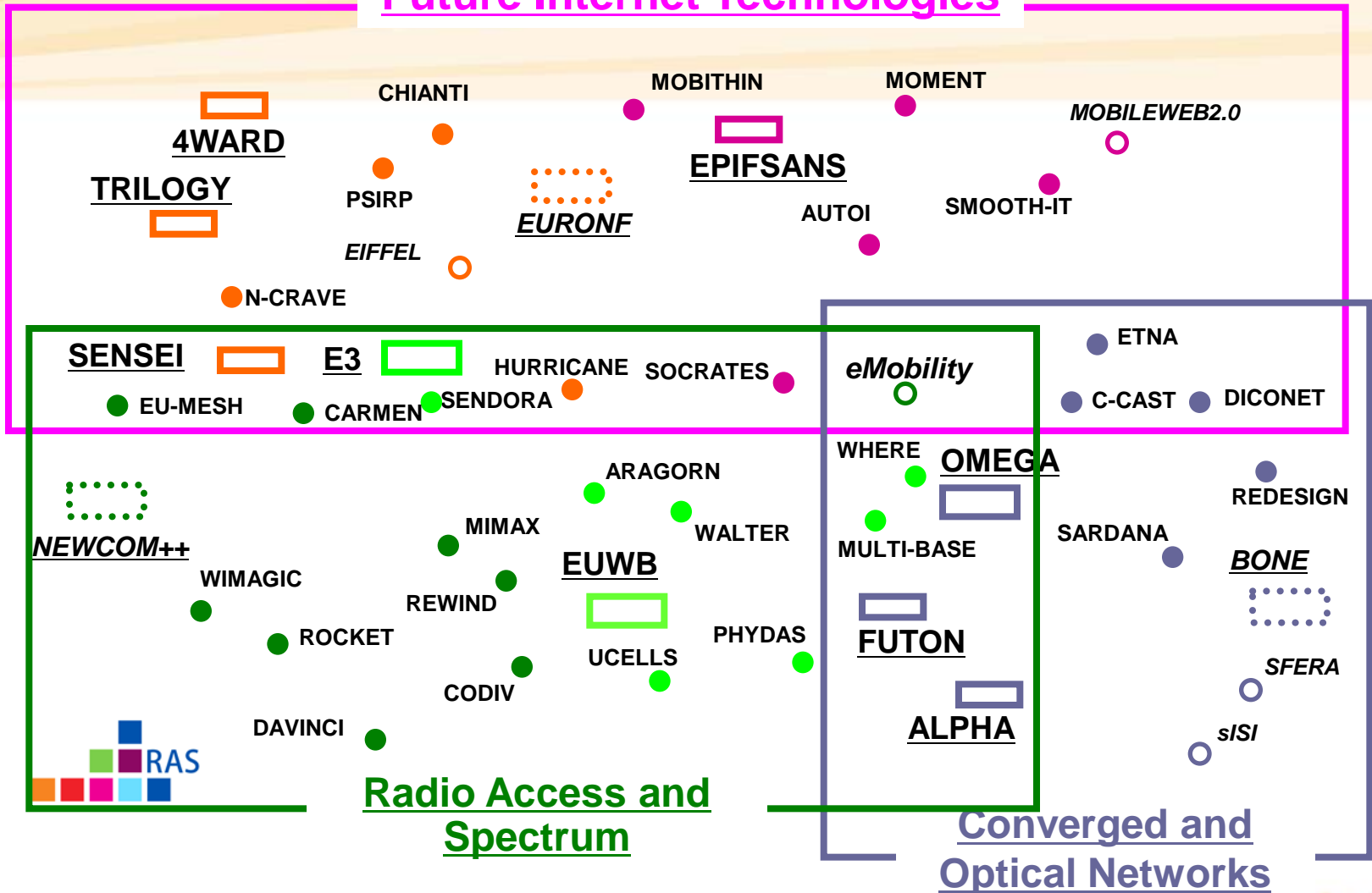
Expected Impact

- Strengthened positioning of **European** industry in the field of Future Internet technologies
- Reinforced European leadership in mobile and wireless broadband systems, optical networks, cognitive network management technologies.
- Increased economic efficiency of access/transport infrastructures (cost/bit)
- Global standards and European IPRs reflecting federated and coherent roadmaps.
- Wider market opportunities from new classes of applications taking advantage of convergence.
- Accelerated uptake of the next generation of network and service infrastructures.

FP7 Future Networks Project Portfolio

(Call 1 funding: 200 M€)

Future Internet Technologies



Summary of Call 5 – Objective 1.1

- IP and STREP's projects in the area of:
 - Future Internet Architectures and Network Technologies
- Networks of Excellence in new and emerging topics, with a clear and limited focus, requiring interdisciplinary teams of researchers
- Coordination and Support Action to support coordination with member states and international initiatives, standardisation, take-up and testing of new European-led Future Internet concepts, road-mapping, events...
- Date of publication: 31 July 2009
- Deadline: **3 November 2009, at 17:00.00** Brussels local time
- Budget per Instrument:

€ Million	IP	STREP	NoE	CSA	Total
Call 5	Min 35,5	Min 21,3	6	3	80

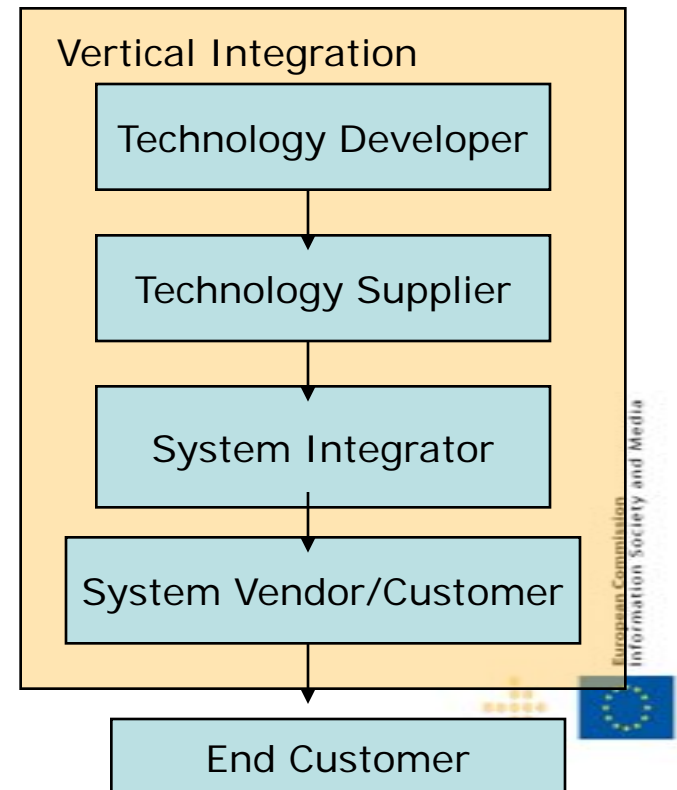
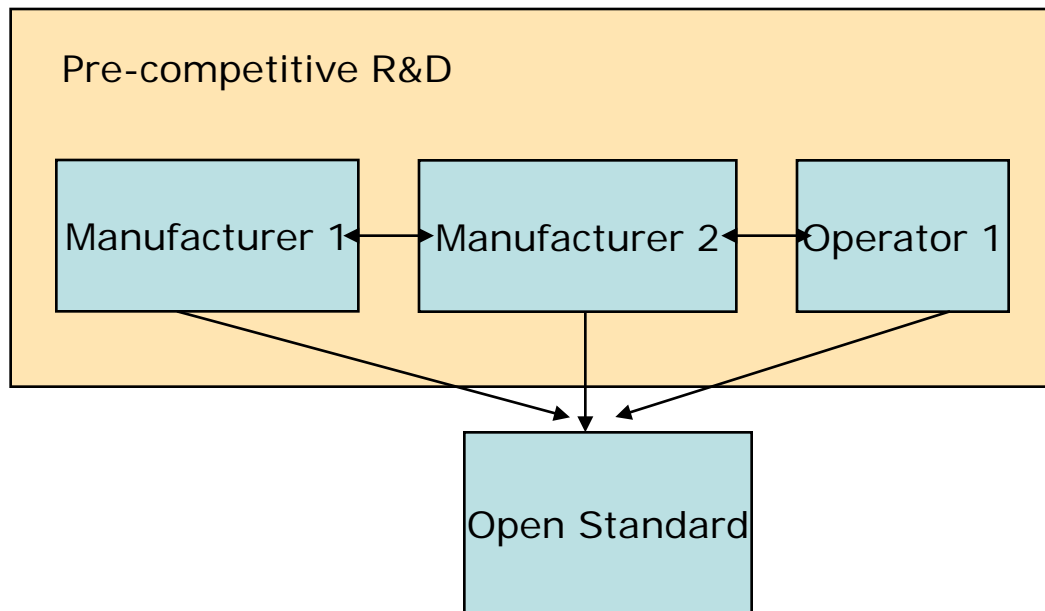
Expected Research Advances for Call 5 Projects in: Future Internet Architectures and Network Technologies

- **Novel Internet architectures and technologies**
 - IPs expected to take architectural views on Future Internet
 - Even in clean-slate approaches, concrete deliverables to be specified
 - STREPS expected to identify specific key challenges and opportunities in the Future Internet
- **Flexible and cognitive network management and operation frameworks**
 - IPs expected to co-design management frameworks with network architecture
 - STREPS and IPs to couple new concepts with proof-of-concept
 - Step-change beyond state-of-the-art and past activities expected



Consortium Strategy (1)

- Both horizontal and vertical integration possible
 - Pre-competitive research -> achieve consolidation among competitors towards open standards (e.g. major industry players driving an IP)
 - Bottom-up research -> vertical integration within the value chain (e.g. technology developer together with potential customer)



Consortium Strategy (2)

- International Companies and International Cooperation
 - Non-European companies based in Europe when win-win for Europe (e.g. **generation of IPR** in Europe)
 - Joint response to global technological and societal challenges
 - For mutual benefits
- Emphasis on New Member States
 - High-quality academic base, innovative SME's, large industry with research
 - Could be hub for later exploitation in NMS and Associated States
 - Good opportunity to be administrative coordinator ?
- SME
 - We need to have much more European Innovative SME's



Evaluation Criteria

	1. Scientific and/or technological Excellence	2. Quality and efficiency of the implementation and the management	3. The potential Impact <i>[See Previous Slide]</i>
All Funding Schemes	<ul style="list-style-type: none"> • <i>Soundness of concept, and quality of objectives</i> 	<ul style="list-style-type: none"> • Appropriateness of the management structure and procedures • Quality and experience of participants 	<ul style="list-style-type: none"> • <i>Contribution to the expected impacts listed in the work programme</i>
Example of Collaborative Projects	<ul style="list-style-type: none"> • <i>Progress beyond the state-of-the-art</i> • Quality and effectiveness of the S/T methodology and associated work plan 	<ul style="list-style-type: none"> • Quality of the consortium as a whole • Appropriateness of the allocation of resources to be committed 	<ul style="list-style-type: none"> • Appropriateness of measures for the dissemination and/or exploitation of project results, and management of intellectual property.

More Information

- The ICT Future Networks web site:
<http://cordis.europa.eu/fp7/ict/future-networks/>
- Future Networks Newsletter and Newsflash:
 - Distributed via email (by subscription - free of charge);
 - Contains info on all activities in the field including calls for proposals, conferences, publications, etc.)
- Mailbox for Call4+5 Queries and Pre-Proposal Check forms:
 - INFOSOFUTURE-NETWORKS-CALLS@ec.europa.eu



Objective ICT-2009.1.2 Internet of Services, Software and Virtualisation



Structure of presentation

- Trends and visions
- Work programme:
 - target outcomes
 - expected impacts
- For more information



Software and Services

- A key industrial sector
 - 1 Mio specialists in EU
 - 200 B€ market (70 B€ Software)
 - EU ICT market growth mainly driven by software and IT services (EITO '06): 5.8% for 2006-07
- The engine room of the Information Society
 - Our society depends more and more on software
 - Important EU industry sectors depend on S&S
 - 70% of software development takes place in non-software companies



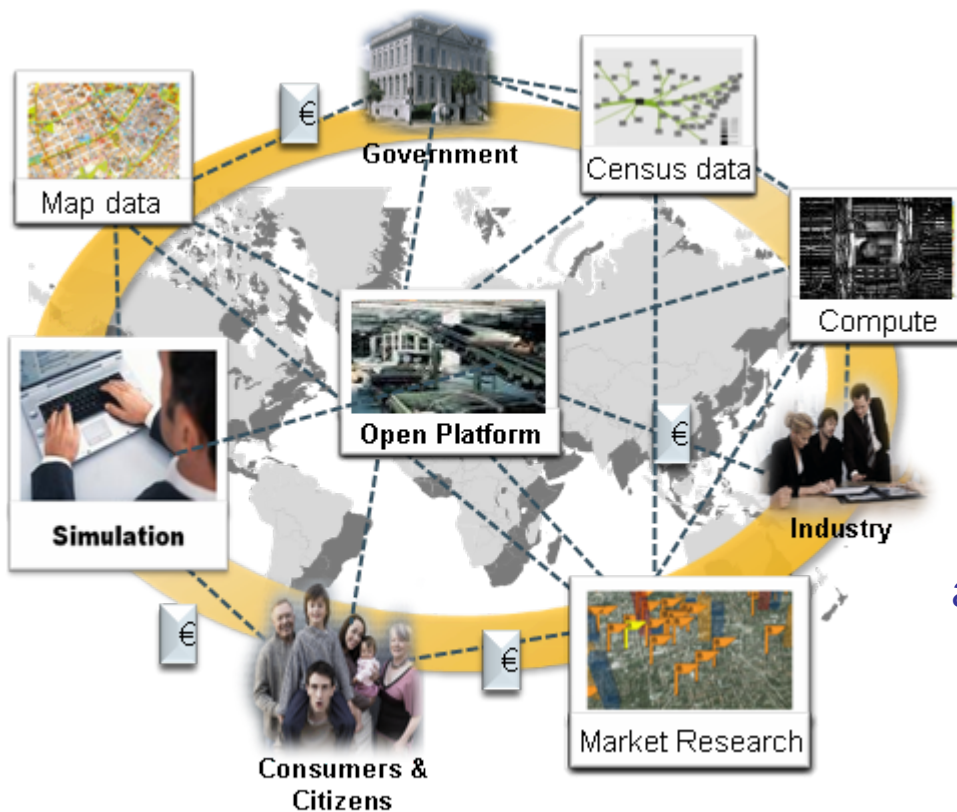
Software & Services

Some Trends

- From software to services
 - eServices, Software as a Service, SOA
 - Resource as a Service, Cloud computing, Need for more flexibility and reduction of TCO in ICT infrastructures
 - Everything as a Service
- *Convergence* of IT, Telecom and Media
From the computer to the Web
- Open innovation & collaborative development
- Competition from newly industrialized countries



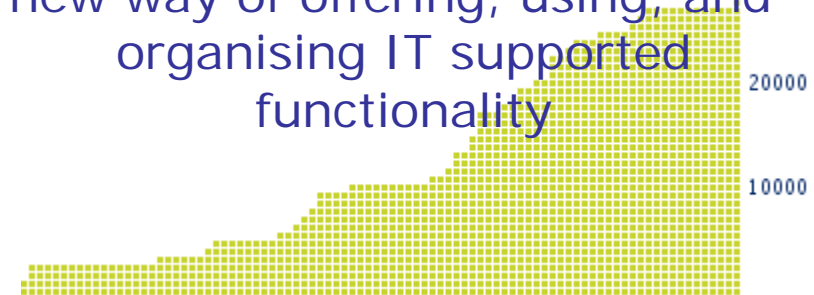
Internet of Services Vision



A multitude of connected IT services, which are offered, bought, sold, used, repurposed, and composed by a worldwide network of service providers, consumers, aggregators, and brokers

- resulting in -

a new way of offering, using, and organising IT supported functionality



Number of Web services found by SEEKDA crawler during the past 25 months

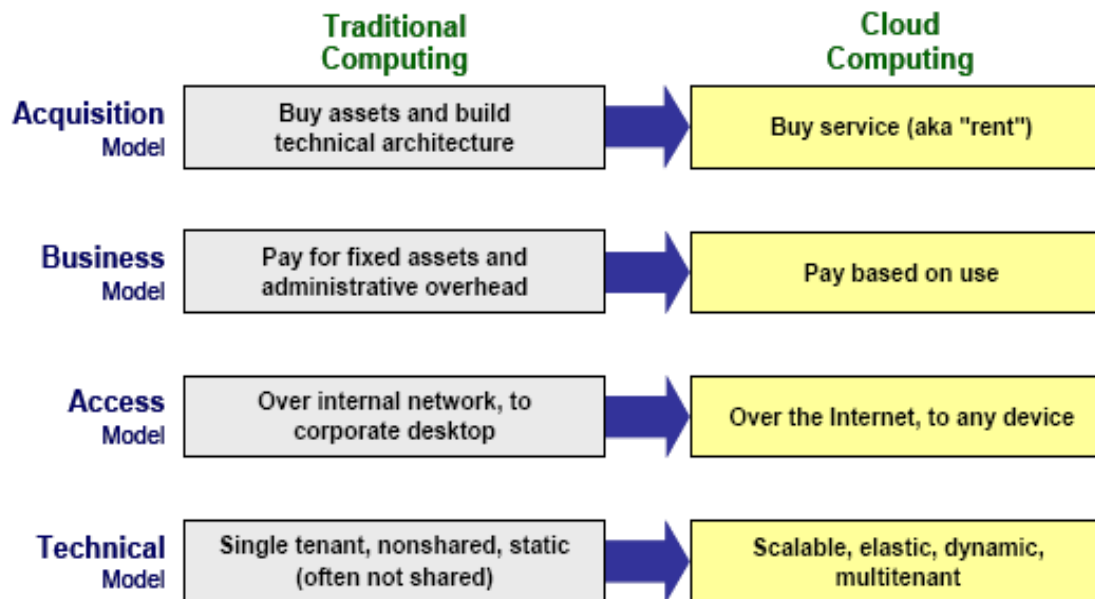
Adapted from SAP Research, 2008, and SEEKDA, 2008

Virtualised Infrastructures

e.g. Cloud Computing



An emerging computing paradigm where data and services reside in massively scalable data centers and can be ubiquitously accessed from any connected device over the Internet¹



Source: Gartner (September 2008)

Merrill Lynch:
Cloud computing market opportunity by 2011 = \$95bn in business and productivity apps + \$65bn in online advertising = \$160bn



ICT Work Programme 2009

Objective ICT-2009.1.2: Internet of Services, Software and Virtualisation

Target outcomes

- a) Service Architectures and Platforms for the Future Internet
 - Service front ends
 - Open, scalable, dependable service platforms, architectures, and specific platform components
 - Virtualised infrastructures

- b) Highly Innovative Service / Software Engineering
 - Service / Software engineering methods and tools
 - Verification and validation methods, tools and techniques
 - Methods, tools and approaches specifically supporting the development, deployment and evolution of open source software

- c) Coordination and support actions



Objective ICT-2009.1.2: Internet of Services, Software and Virtualisation

Expected Impact

- A major contribution to the Future Internet
- Deep technological advances in software/service engineering
- Lowered barriers for service providers, in particular SMEs, to develop services
- Massive uptake of high-added value services
- A strengthened industry in Europe for software, software services and Web services



Instruments and budgets

- a) Service architectures and platforms for the future internet: IP, STREP
 - b) Open, scalable, dependable service platforms, architectures...: IP, STREP
 - c) Coordination and support: CSA
- Call 5 budget CP: 107 M€ (min 50% IP, min 30% STREP)
 - Budget CSA: 3 M€

For more information

FP7

<http://cordis.europa.eu/fp7/>

<http://cordis.europa.eu/fp7/ict/>

Software & Service Architectures and Infrastructures

<http://cordis.europa.eu/software-services>

Future Internet

<http://ec.europa.eu/foi>

<http://www.future-internet.eu/>

E-mail

info-st@ec.europa.eu



Call 5

ICT WP 09-10 Obj. 1.3
Internet of Things and Enterprise
Environments



Challenge 1 and the Future Internet

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Apps.

Networked
Search

3D and Media
Internet

Experimental Facilities + Experimentally Driven research

Trustworthy Networks + Trustworthy Services

Tools and technologies for Trust



Introducing Objective 1.3: Internet of Things and Enterprise Environments

Target outcomes

- a) Architectures and technologies for an Internet of Things
- b) Future Internet based Enterprise Systems
- c) International co-operation and co-ordination

X) Part of the Future Internet Initiative

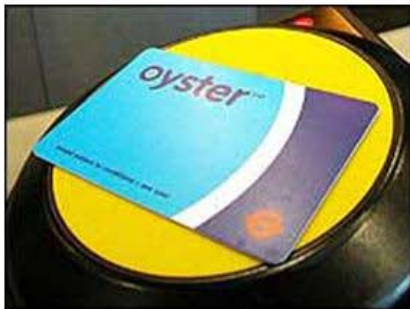
XX) A disruptive call

XXX) Pave the way towards IoT for business

A) Internet of Things

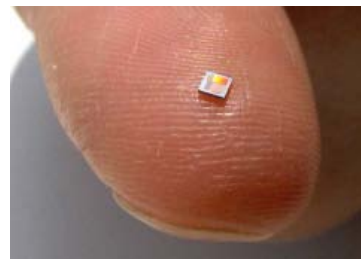


Tomorrow's ubiquitous world of tags, sensors and smart systems



Key Open Issues of the IoT

- **Architecture (edge devices, servers, discovery services, security, privacy etc.)**
- **Governance, naming, identity, interfaces**
- **Service openness, interoperability**
- **Connections of real and virtual world**
- **Spectrum (HF, UHF, ISM etc?)**
- **Standards**



a) Architectures and technologies for an Internet of Things

Funding scheme: IP & STREP

- 1. Architectures and technologies using open protocols, which enable novel Internet-based applications**
 - Aggregation of virtual and physical worlds
 - Event processing of tags, sensors, actuators

 - 2. Optimised technologies covering distribution of intelligence**
 - Roles of network edges and central information system
 - Interoperability and integration with business platforms and object life cycle data

 - 3. Architectural models**
 - Enabling an open governance scheme without centralised gatekeeper lock-in for critical business/process functionalities
- Reference models and applications scenarios for the Internet of things



a) Architectures and technologies for an Internet of Things

• Remarks and clarifications

- Targeted are reference models and applications scenarios for the Internet of things including SW and HW technologies.
- Proposals must demonstrate a business vision/context and model for the applications.
- The three areas of target outcomes (i., ii., iii.) can be addressed in common or separately –however, the third area (iii.) is most likely to be dealt with in an Integrated Project.
- Participation is also possible for third countries with priority for those with links in the field (USA, Japan, South Korea, China, India). Financing is limited to travel costs in the Coordination Actions and for work contribution in exceptional cases.
- If used, RFID can only be one part of the technological building blocks



b) and Enterprise environments



The (Future) Internet *is* the Enterprise

- A new participative web, hosting a new wave of services, using user-friendly technologies is **empowering the enterprise** of the future
- For the enterprise, the Internet becomes the platform through which knowledge is dynamically manipulated, experienced in the business context and *re-presented* in a radically different way to **create new value**
- The Internet blurs the boundaries between the intra and extra *muros* enterprise domain; collaboration becomes rooted in the **essence of entrepreneurship**
- Web-based applications become as rich as the desktop: we see the emanation of **the WYSIWYG enterprise**



Future Internet based Enterprise Systems

Funding scheme: IP & STREP

- **b) Future Internet based Enterprise Systems**
 - Software platforms supporting highly innovative networked businesses on top of an Internet of Services.
 - Enabling increased flexibility of the resources managed by virtual organizations
 - facilitating dynamic outsourcing with third parties capability to aggregate services, act as intermediaries for delivery, and provide innovative new channels for consumption.
- Key features:
- Collaboration and interoperability within dynamic ecosystems
 - next generation knowledge management services, making use of semantically enriched information, including object/sensor information



Future Internet based Enterprise Systems

- **Some indicative research issues**
 - Opportunity to use Future Internet Technology in Enterprise Environments (impact on EI&EC)
 - System requirements for Enterprise Networking in FI paradigms
 - Software platforms on top of the Internet of Services
 - Shared vision, new perspectives, new value propositions and new ideas for FInES
 - CSA for an EI Science Base would be welcomed (for developing fundamental knowledge on complex environments integration)
- **Remarks**
 - Proposals must demonstrate a business vision/context and model for the applications
 - This area of target can be addressed in common or separately with bullet a)
 - System requirements and software platforms is most likely to be dealt with in an Integrated Project.



International co-operation and co-ordination

1.4

- **c) International co-operation and co-ordination**
 - Strategic visions covering the Internet of Things and/or integrated businesses; research roadmaps, organisation of events.
 - Worldwide cooperation networks on IoT with relevant partners from all over the world
 - Work on EI Science base,
 - Clusters support, etc.
 - RFID: Organisation of the European follow-up of as part of the 'Lighthouse priority project' to support the established dialogue.



Impact and Funding schemes

- Expected impact
 - Strengthened competitiveness of European businesses in all sectors of the economy
 - European leadership in the supply of integrated business solutions taking advantage of the fusion between the real world and the virtual web-based world
- Funding schemes
 - a), b): IP, STREP; c): CSA
- Indicative budget distribution (ICT call 5)
 - IP/STREP: EUR 35 million; the objective is to support at least 2 IPs
 - CSA: EUR 2 million
- Good balance between industry, academia and end-users
- No short term R&D (time to market should be at least 5 years)
- Leading players: ICT manufacturers, telecom operators, software and service providers, integrators, auto-identification research centres, leading edge users such as networked companies, hospitals, energy installers, logistics managers, etc.
- Key Players are:
 - Research clusters on IoT and FIInES
 - European Technology Platform EPoSS



More information and links

- **INFSO**

- http://ec.europa.eu/information_society/policy/rfid/events/past/Info18022009/index_en.htm
- A specific (second) information day will take place in Brussels on 16 September 2009

- **UNIT D4 Internet of Things and Enterprise Environments**

- Obj. 1.3 Contact: alain.jaume@ec.europa.eu