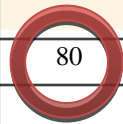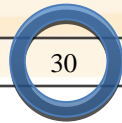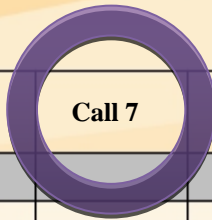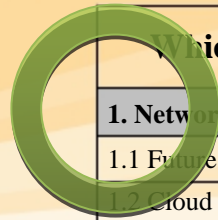# Bent Egebart, Whyse aps

Independent adviser

Call, Challenge, Objective, Impact….

Which Objective in which Call? (M €)	FI-PPP Call 1	Call 7	Call 8	Call 9	FI-PPP Call 2
1. Network and Service Infrastructures					
1.1 Future Networks			160		
1.2 Cloud Computing, Internet of Services etc			70		
1.3 Internet-connected Objects		30			
1.4 Trustworthy ICT			80		
1.5 Networked Media & Search Systems		70			
1.6 FI Research & Experimentation		20	25		
1.7 PPP FI: Core Platform	41				
1.8 PPP FI: Use Case scenarios & early trials	40				67.5
1.9 PPP FI: Infrastructure Support	3				12.5
1.10 PPP FI: Programme Support	6				
2. Cognitive Systems and Robotics					
2.1 Cognitive Systems and Robotics		73		82	
3. Alternative Paths to Components & Systems					
3.1 Very advanced nanoelectronic components			60		
3.2 Smart components & systems integration		41	39		
3.3 Embedded systems, monitoring & control		50			
3.4 Computing Systems		45			
3.5 Core and disruptive photonic technologies		25	92		
3.6 Organic Electronics and Photonics		50			
4. Technologies for Digital Content & Languages					
4.1 SME initiative on Digital Content & Languages*		35*			
4.2 Language Technologies		50			
4.3 Digital Preservation				30	
4.4 Intelligent Information Management			50		

* Separate call

Which Objective in which Call? (M €)	PPPs 2010 Call	Call 7	Call 8	Call 9	PPPs 2011 Call
5. ICT for Health, Ageing Well, Inclusion & Governance					
5.1 Personal Health Systems (PHS)		60			
5.2 Virtual Physiological Human (VPH)		1.5		66.5	
5.3 Patient Guidance Services (PGS)		35			
5.4 ICT for Ageing and Wellbeing		37			
5.5 ICT for smart and personalised inclusion		35			
5.6 ICT Solutions for governance and policy modelling		25			
6. ICT for a Low Carbon Economy					
6.1 Smart energy grids			30		
6.2 ICT systems for Energy Efficiency		35			
6.3 ICT for efficient water resources management			15		
6.4 PPP EEB: ICT for energy-efficient buildings & spaces	20				
6.5: PPP EEB: ICT for energy-positive neighbourhoods					30
6.6 Low-carbon multi-modal mobility and freight transport		50			
6.7 Cooperative systems for sustainable mobility			40		
6.8 PPP GC: ICT for fully electric vehicles	30				30
7. ICT for the Enterprise and Manufacturing					
7.1 PPP FoF: Smart factories					40
7.2 PPP FoF: Manufacturing Solutions for new ICT products					20
7.3 PPP FoF: Virtual factories and enterprises	45				
7.4 PPP FoF: Digital factories	35				
8. ICT for Learning and Access to Cultural Resources					
8.1 Technology-Enhanced Learning			60		
8.2 ICT for access to cultural resources				40	

Which Objective in which Call? (M€)	Call 7	Call 8	Call 9	FET Open
9. Future and Emerging Technologies				
FET-Open				
9.1 Challenging current Thinking				75
9.2 High-Tech Research Intensive SMEs in FET research				9
9.3 FET Young Explorers				6
9.4 International cooperation on FET research				3
FET-Proactive				
9.5 FET Flagship Initiative Preparatory Actions*	10*			
9.6 FET Proactive: Unconventional Computation		15		
9.7 FET Proactive: Multi-Level Complex Systems		23		
9.8 FET Proactive: Energy Consumption of Computing		15		
9.9 FET Proactive: Quantum ICT			22	
9.10 FET Proactive: Collective Adaptive Systems			23	
9.11 FET Proactive: Neuro-Bio-Inspired Systems			23	
9.12 Coordinating Communities etc	3	3	2.5	
9.13 Exa-scale computing, software and simulation	25			
9.14 Joint Call ICT-SSH on 'Science of Global Systems'		3.5		
10. International Cooperation				
10.1 EU-Brazil Research and Development Cooperation*	5*			
10.2 EU-Russia Research and Development Cooperation*	4*			
10.3 International Partnership building & dialogues	4		2	
11. Horizontal Actions				
11.1 Pre-Commercial Procurement Actions	5			
11.2 National Contact Points	4			
11.3 Cooperation in an Enlarged Europe	10			

* Separate calls

FP7 ICT Work Programme 2011-12

Minsk 2. December 2010
Call 7

European Commission

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ICT in FP7 - Where do we stand?

- Behind us
  - ICT Calls for proposals under WP 2007-08 and WP 2009-10
    - >4200 M€ of EU funding committed
    - >1100 projects launched or to be launched
    - >10000 participations
    - >3600 distinct organisations participating
  - Calls under two Joint Technology Initiatives (Artemis and Eniac) and the Ambient Assisted Living Joint Programme (AAL) in 2008, 2009 and 2010

- Ahead of us
  - ICT WP 2011-12
    - 2422 M€ funding
  - ICT WP 2013
    - >1500 M€ funding
  - JTIs + AAL WPs 2011, 2012, 2013

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Calls for Proposals - Deadlines

- ICT Call 7...18 Jan 2011
- EU/Brazil coordinated call .... 18 Jan 2011
- FET Flagship Initiatives .... 2 Dec 2010
- EU/Russia coordinated call .... 12 Nov 2010
- FET Open .... Continuously open

- Future Internet PPP Call 1 .... 2 Dec 2010
- Energy-Efficient Buildings, Green Cars,
  Factories of the Future PPPs Call 2010... 2 Dec 2010

FP7 ICT Programme Objectives

- Reinforce basic ICT technologies and infrastructures
  - seize new opportunities in emerging fields, build on existing strengths, help share risks and build partnerships

- Reinforce ICT contributions to major socio-economic challenges
  - health and ageing, lower-carbon economy, sustainable manufacturing and services, learning and cultural resources

- Support to international cooperation
- Strengthen cooperation in an enlarged Europe
- Support to pre-commercial procurement

FP7/ICT Programme Structure

ICT for socio-economic challenges

5. ICT for Health, Ageing, Inclusion & Gov.

6. ICT for Lower-Carbon Economy

7. ICT for Manufac. & Enterprise

8. ICT for Learning & Cultural Resources

Basic ICT technologies & infrastructures

1. Network and Service Infrastructures

2. Cognitive Systems and Robotics

3. Component and Systems

4. Digital Content and Languages

Future & Emerging Technologies (FET)

International cooperation, Cooperation in an **enlarged** Europe, **Pre-commercial Procurement**

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Funding schemes/Instruments

3 funding schemes – 5 "instruments"

- ## Collaborative Projects (CP)*

  Small or medium scale focused research actions ("STREP")

  Large Scale Integrating Projects ("IP")

  > 2216 m€
  > ~92,5% of 2011/12 budget

- ## Networks of Excellence (NoE)

  > 32.5 m€
  > ~1,5% of 2011/12 budget

- ## Coordination and Support Actions (CSA)

  Coordinating or networking actions ("CA")

  Support Actions ("SSA")

  > 151 m€
  > ~6% of 2011/12 budget

ICT Workprogramme shows budget pre-allocation to instruments

*include SICA – Specific International Co-operation Actions

Integrating Projects (IPs)

Ambitious objective driven research with a 'programme approach'

Activities in an Integrating Project may cover
- research and technology development activities
- demonstration activities
- technology transfer or take-up activities
- training activities
- dissemination activities
- knowledge management and exploitation
- consortium management activities
- other activities

Some figures:
typically 36-60 months
7-36 participants – avg 15
4-19 m€ funding – avg 8.3

An Integrating Project comprises
- a coherent set of activities
- and an appropriate management structure

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Focused projects (STREPs)

- Targeting a specific objective in a clearly defined project approach
- Fixed overall work plan with stable deliverables that do not change over the life-time of the project
- Contain two types of activity or combination of the two:
  - **research and technological development activity**
    e.g. to generate new knowledge,
    to improve competitiveness,
    to address major societal needs
  - **demonstration activity**
    to prove the viability of new technologies
    but which can not be commercialised directly
    (e. g. testing of product like prototypes)

  as well as

  - **Consortium management activities** (including innovation related activities like protection of knowledge dissemination and exploitation

Some figures:
typically 18-36 months
4-24 participants – avg 8
1-6 m€ funding – avg 2.7

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Networks of excellence

To overcome the fragmentation of the European research landscape in a given area and remove the barriers to integration

To reach a <u>durable</u> restructuring and integration of efforts and institutions or parts of institutions

The success of an NoE is not measured in terms of scientific results

- …..but by the extent to which the social fabric for researchers and research institutions in a field has changed due to the project,

- ….and the extent to which the existing capacities become more competitive as a result of this change

Some figures:
typically 48-60 months
4-49 participants – avg 18
2-8 m€ funding – avg 4.6

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Networks of excellence

The JPA contains a range of "additional to normal business" activities:

Integrating activities
- coordinated programming of the partners' activities
- sharing of research platforms/tools/facilities
- joint management of the knowledge portfolio
- staff mobility and exchanges
- relocation of staff, teams, equipment
- reinforced electronic communication systems

Activities to support the network's goals
- Development of new research tools and platforms for common use
- Generating new knowledge to fill gaps in or extend the collective knowledge portfolio

Activities to spread excellence
- training researchers and other key staff
- dissemination and communication activities
- networking activities to help transfer knowledge to outside of the network
- where appropriate, promoting the exploitation of the results generated
- where appropriate, innovation-related activities

Consortium management activities

Coordination actions

Designed to:

- promote and support the ad hoc networking and co-ordination of research and innovation activities at national, regional and European level over a fixed period for a specific purpose

- by establishing in a coherent way coordinated initiatives of a range of research and innovation operators, in order to achieve improved cooperation of the European research

May combine the following two types of activities

- Co-ordination activities
- Consortium management activities

Some figures:
typically 19-36 months
3-40 participants – avg 11
0.3-3 m€ funding – avg 1

(Coordination actions do not conduct S&T research !)

Support actions

Designed to

- underpin the implementation of the programme
- complement the other FP7 funding schemes,
- help in preparations for future Community research and technological development policy activities and
- stimulate, encourage and facilitate the participation of SMEs, civil society organisations, small research teams, newly developed and remote research centres, as well as setting up research clusters across Europe
- Cover one off events or single purpose activities

May combine the following two types of activities

- Support activities
- Consortium management activities

Some figures:
typically 9-30 months
1-21 participants – avg 8
0.2-3 m€ funding – avg 0.9

(Support actions do not conduct S&T research !)

If the time is in sync with me
it is now time for...

FP7/ICT Programme Structure

ICT for socio-economic challenges

260 M€, 11%

5. ICT for Health, Ageing, Inclusion & Gov.

280 M€, 12%

6. ICT for Lower-Carbon Economy

140 M€, 6%

7. ICT for Manufac. & Enterprise

100 M€, 4%

8. ICT for Learning & Cultural Resources

Basic ICT technologies & infrastructures

1. Network and Service Infrastructures

625 M€, 26%

2. Cognitive Systems and Robotics

155 M€, 6%

3. Component and Systems

402 M€, 17%

4. Digital Content and Languages

165 M€, 7%

Future Internet PPP

Green Car PPP

Energy Efficient Buildings PPP

Factory of the Future PPP

PPPs Deadline: 2/12/10

Future & Emerging Technologies (FET)

261 M€, 11%

International cooperation, Cooperation in an **enlarged** Europe, **Pre-commercial Procurement**

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21

Why Public Private Partnerships (PPP)?

- Strong focus on industry-led roadmaps
- Cut across themes, technologies and research disciplines
- Cut across policy silos ("supply and technology push" + "demand and market pull")

- INFSO/ICT PPP
  - Future Internet PPP
- Jointly implemented with other Themes (DG RTD, ENV, ENERGY)
  - ICT in the Factories of the Future PPP
  - ICT in the Green Cars PPP
 - ICT in the Energy Efficient Buildings PPP

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Network and service infrastructures

- 1.3: Internet-connected objects

  30 M€
  - distributed networks of cooperating objects (sensors, actuators ...)
  - scale, heterogeneity, mobility ... integration with service layers ...
  - enabling person/object and object/object communications

- 1.5: Networked media and search systems

  70 M€
  - digital media delivery platforms: integration with network, adaptation, fusion ...
  - end-to-end immersive and interactive media technologies: 3D evolution, MR, QoE ...
  - multimedia search technologies: user-centric, context-aware, sensor-based ...

- 1.6: Future Internet Research and Experimentation (FIRE)

  20 M€
  - facilities for experimentally-driven R&D on Future Internet
  - providing larger scale and diversity to test and validate the developments at conditions close to reality
  - e.g Future Internet research, service platforms, 3D Internet ...
  - + 25 M€ in ICT Call 8
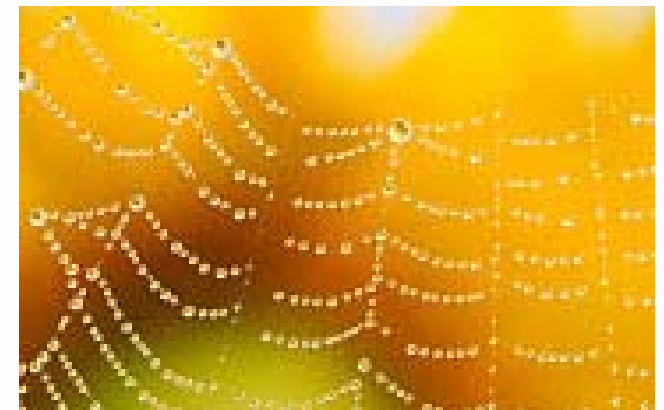
Future Internet PPP

- ## 1.7-1.10: Future Internet Public Private Partnership
  - ### Holistic approach
    - towards very high rate mobile access, intelligent service capability, immersive media, secure and trusted platforms, new devices & sensors ..
  - ### 1.7: Core Platform

  41 M€

  - with generic enablers, functionalities that can be composed or reused...
  - ### 1.8: Use cases

  40 M€

  - application scenarios using e.g. context-awareness, RT info processing, ad-hoc service composition ...
  - ### 1.9: Infrastructure support

  3 M€

  - requirements for experiments and validation ...
  - ### 1.10: Programme facilitation and support

  6 M€

  - coordination and accompanying measures ...
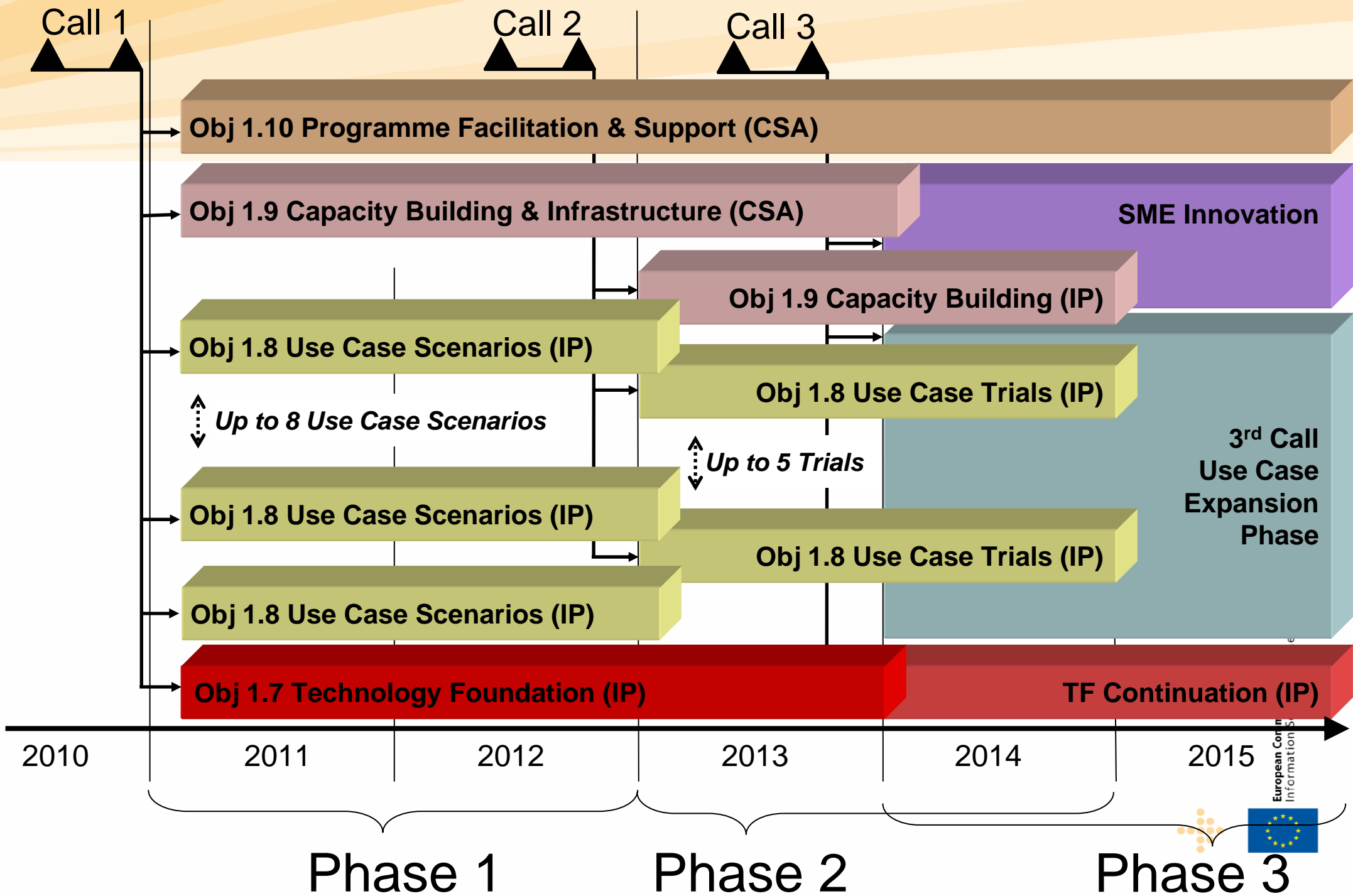 - ### + 80 M€ in FI PPP Call in 2012

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Programme Architecture

Call 1

Call 2

Call 3

Obj 1.10 Programme Facilitation & Support (CSA)

Obj 1.9 Capacity Building & Infrastructure (CSA)

SME Innovation

Obj 1.9 Capacity Building (IP)

Obj 1.8 Use Case Scenarios (IP)

Up to 8 Use Case Scenarios

Obj 1.8 Use Case Trials (IP)

Up to 5 Trials

Obj 1.8 Use Case Scenarios (IP)

3rd Call Use Case Expansion Phase

Obj 1.8 Use Case Trials (IP)

Obj 1.8 Use Case Scenarios (IP)

Obj 1.7 Technology Foundation (IP)

TF Continuation (IP)

2010   2011   2012   2013   2014   2015

Phase 1   Phase 2   Phase 3

Cognitive systems and robotics

- **2.1: Cognitive systems and robotics**

  73 M€

  - robotic systems operating in dynamic, non-deterministic, real-life environments
    - research on engineering robotic systems and on endowing robotic systems with cognitive capabilities
    - responding in a timely and sensible manner and with a suitable degree of autonomy to gaps in their knowledge, and to situations not anticipated at design time
  - cooperation between robotics and cognitive systems research communities
  - + 82 M€ in ICT Call 9

@Sensopac

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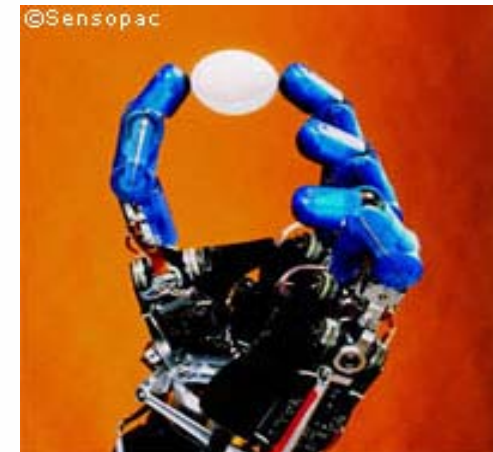
Smart systems, embedded systems, computing systems
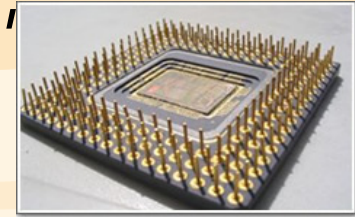
- **3.2: Smart components and smart systems integration**

  41 M€
  - integration of new functionalities (sense, actuate, process, comm, energy scavenging ...) for next generation of application-specific components and smart systems (SoC, SiP ...)
  - convergence of microelectronics, nano-materials, biochemistry, measurement technology and ICT – complementary to the ENIAC Joint Technology Initiative
  - + 39 M€ in ICT Call 8

  3.3: Emdedded systems, monitoring and control

  50 M€
  - design, modelling and operation of systems composed of a large number of independent, heterogeneous and interacting embedded systems, as well as their monitoring and control
  - management of interconnected large, yet autonomous systems (systems-of-systems)
  - complementary to the ARTEMIS Joint Technology Initiative

- **3.4: Computing systems**
  - parallelisation and programmability methods

  45 M€
  - allow adaptation of existing software to multicore computing architectures and systems
  - embedded devices/general-purpose/high performance computing

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Photonics, organic electronics

- 25 M€ **3.5: Core and disruptive photonic technologies**
  - lasers, waveguides, photodetectors, amplifiers, LEDs, optical fibres, etc
  - new components and systems for: laser systems, optical fibres, quantum comm, biophotonics, imaging systems, lighting, info displays, memory, storage ...
  - + 92 M€ in ICT Call 8

- 50 M€ **3.6: Flexible, organic and large area electronics and photonics**
  - advanced, low temperature processing, printable devices and systems on large area and/or flexible substrates
    - Eg. light emitting and sensing devices, photovoltaics, displays, printed electronics for smart tags, or wearable smart textiles
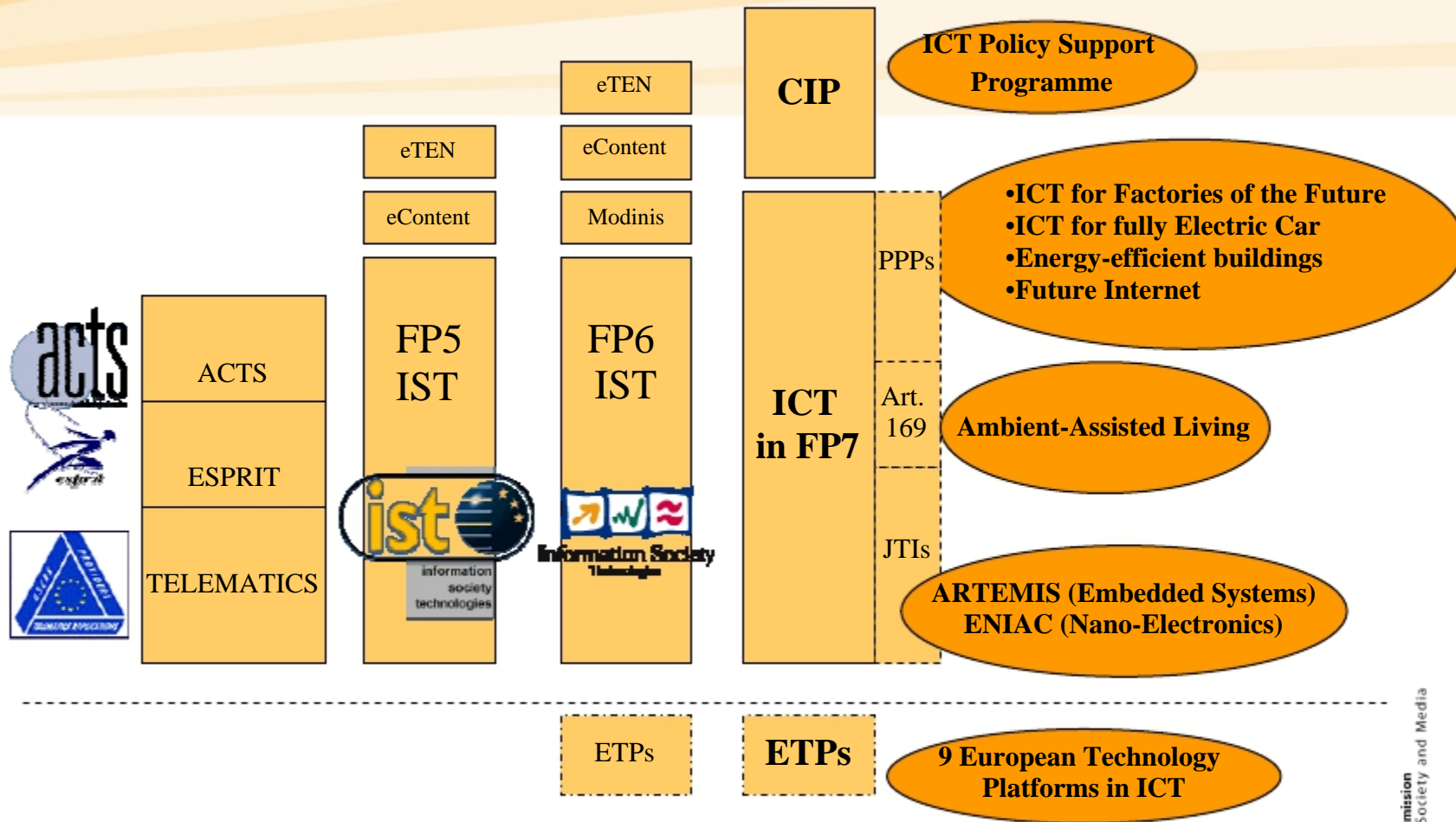
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European Research in Computing Systems:

Background & Next Call for Proposals

ICT Programme

European Commission

Information and Communication Technologies evolution
in the
EU Research Framework Programmes
Complementary instruments + wider mobilisation of resources

ICT Policy Support Programme

- ICT for Factories of the Future
- ICT for fully Electric Car
- Energy-efficient buildings
- Future Internet

Ambient-Assisted Living

ARTEMIS (Embedded Systems)
ENIAC (Nano-Electronics)

9 European Technology Platforms in ICT

CIP

eTEN

eContent

Modinis

FP6 IST

eTEN

eContent

FP5 IST

ACTS

ESPRIT

TELEMATICS

ICT in FP7

PPPs

Art. 169

JTIs

ETPs

ETPs

... FP4
1994-1998

FP5
1998-2002

FP6
2002-2006

FP7
2007-2013

Positioning of the Programme

Research and development

Commercial development

R&D (Product Driven Research + Pre-commercial Development)

Commercial Development

Curiosity Driven Research

Solution Exploration

Prototyping

Original development of a pre-commercial volume of first products/services in the form of a test series

Commercialisation of products/services

Product Idea	Solution Design	Prototype	First Test Products	Commercial End Products

Typical Innovation Life Cycle

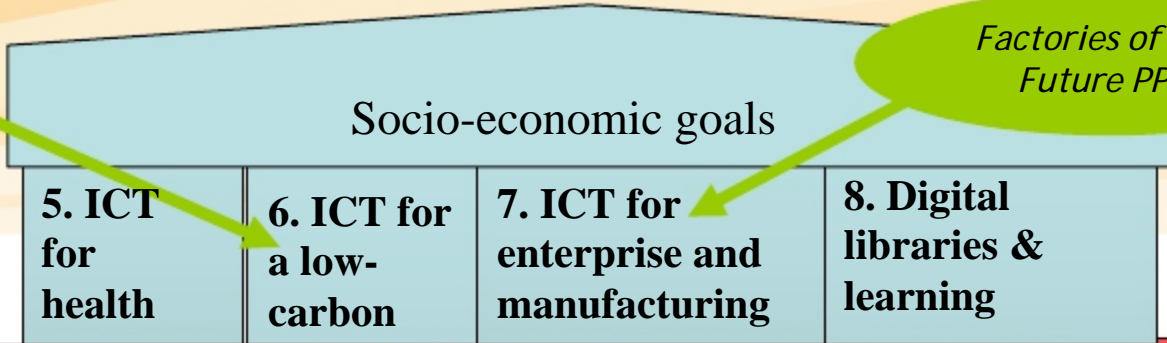# The context: Trends influencing the WP

- ICT, the engine for growth in a **low carbon economy**
  - smarter energy grids, energy efficient buildings, greener cars & transport systems, lighting & manufacturing

- **Changing value chains** & new market opportunities
  - Web and Internet-based services, open platforms for resource sharing, Cloud computing

- **Technology developments** at a cross-roads
  - Future Internet: Medium and longer term developments
  - Components: nanoelectronics, photonics, new materials
  - *Multi-core architectures, new programming paradigms*
  - Smart environments: embedded, networked, learning capabilities
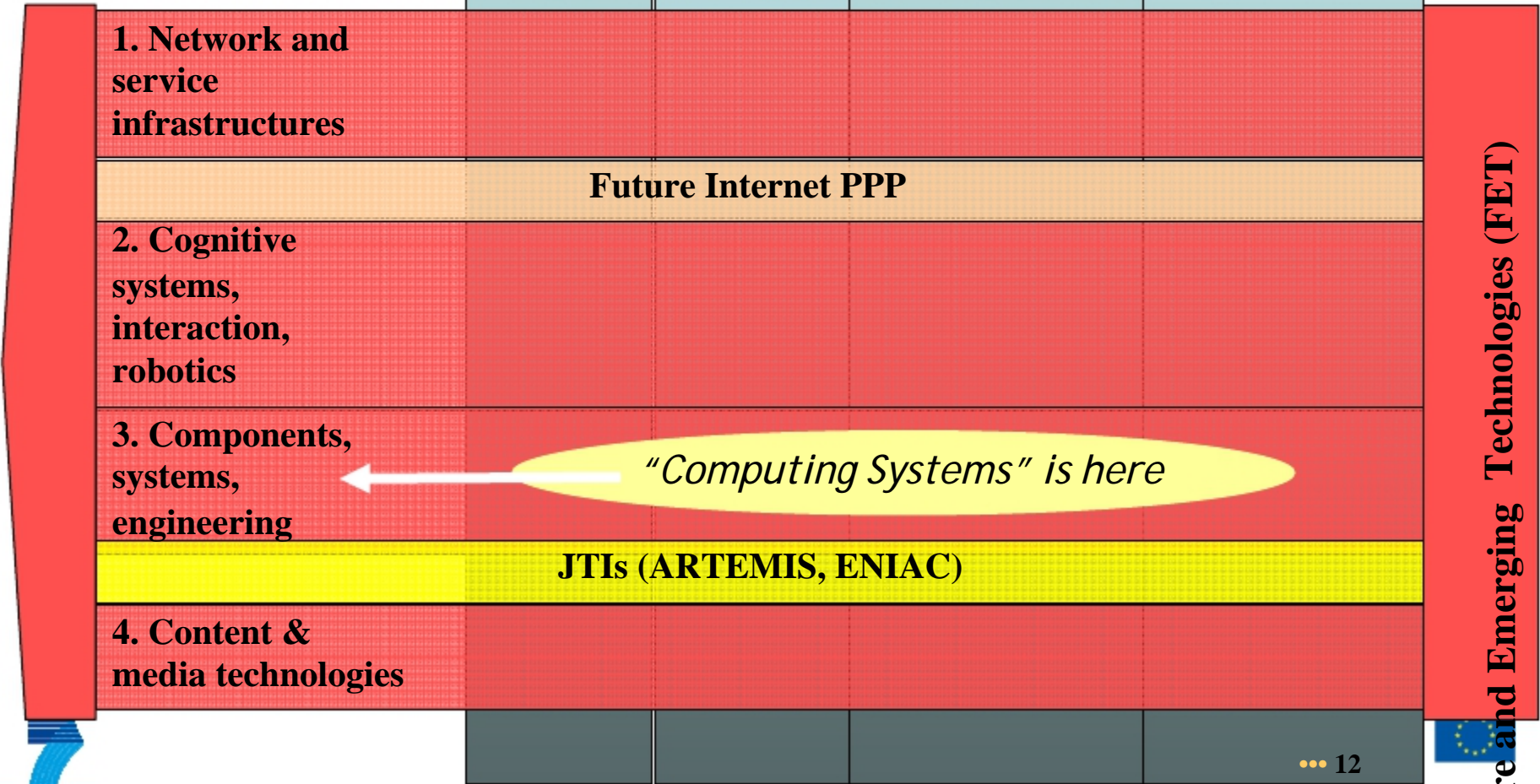 - Digital media and new forms of content

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2011-2012 ICT Work Programme *Challenges*

Green Cars PPP & Energy Efficient Buildings PPP

Factories of the Future PPP

Socio-economic goals
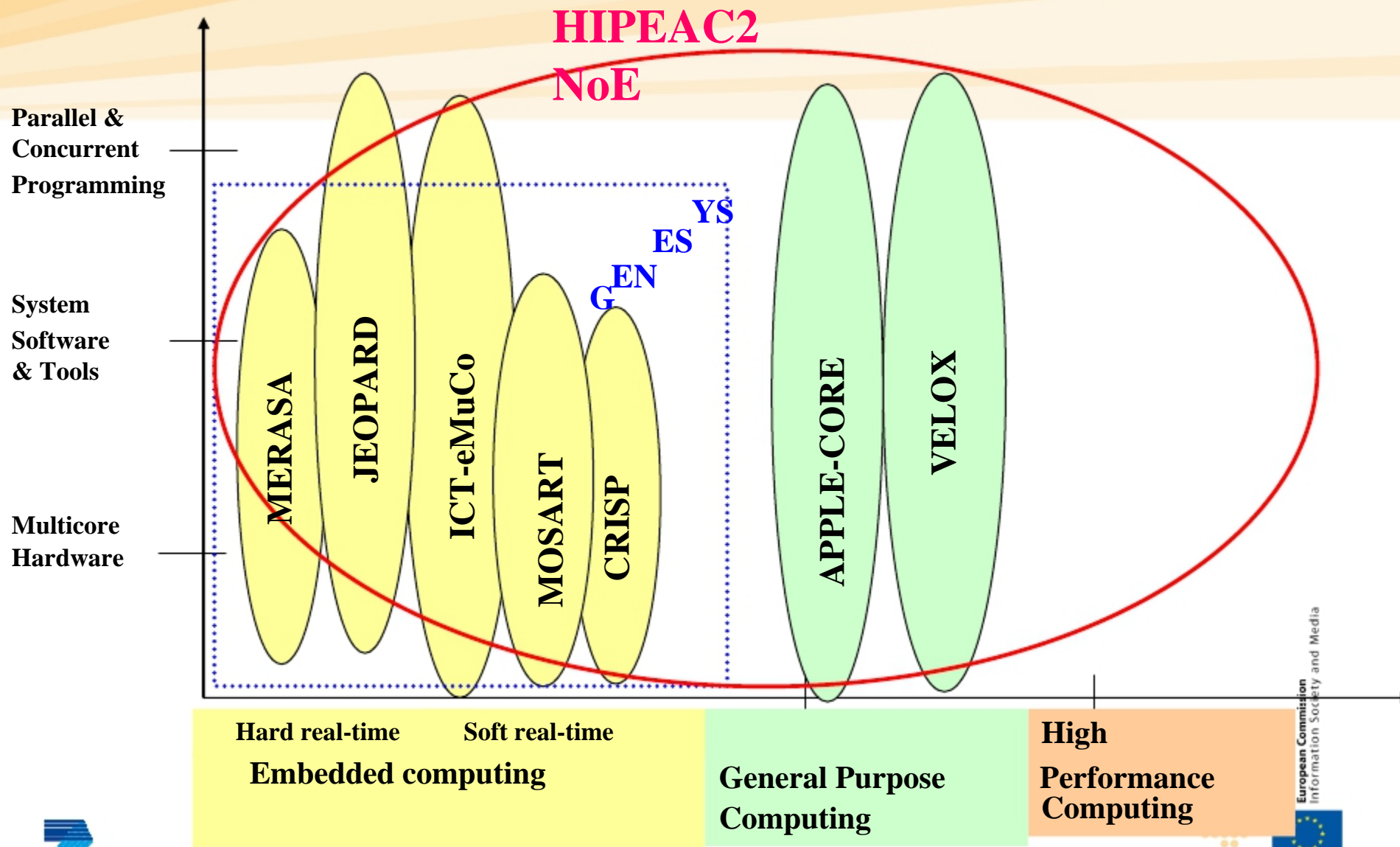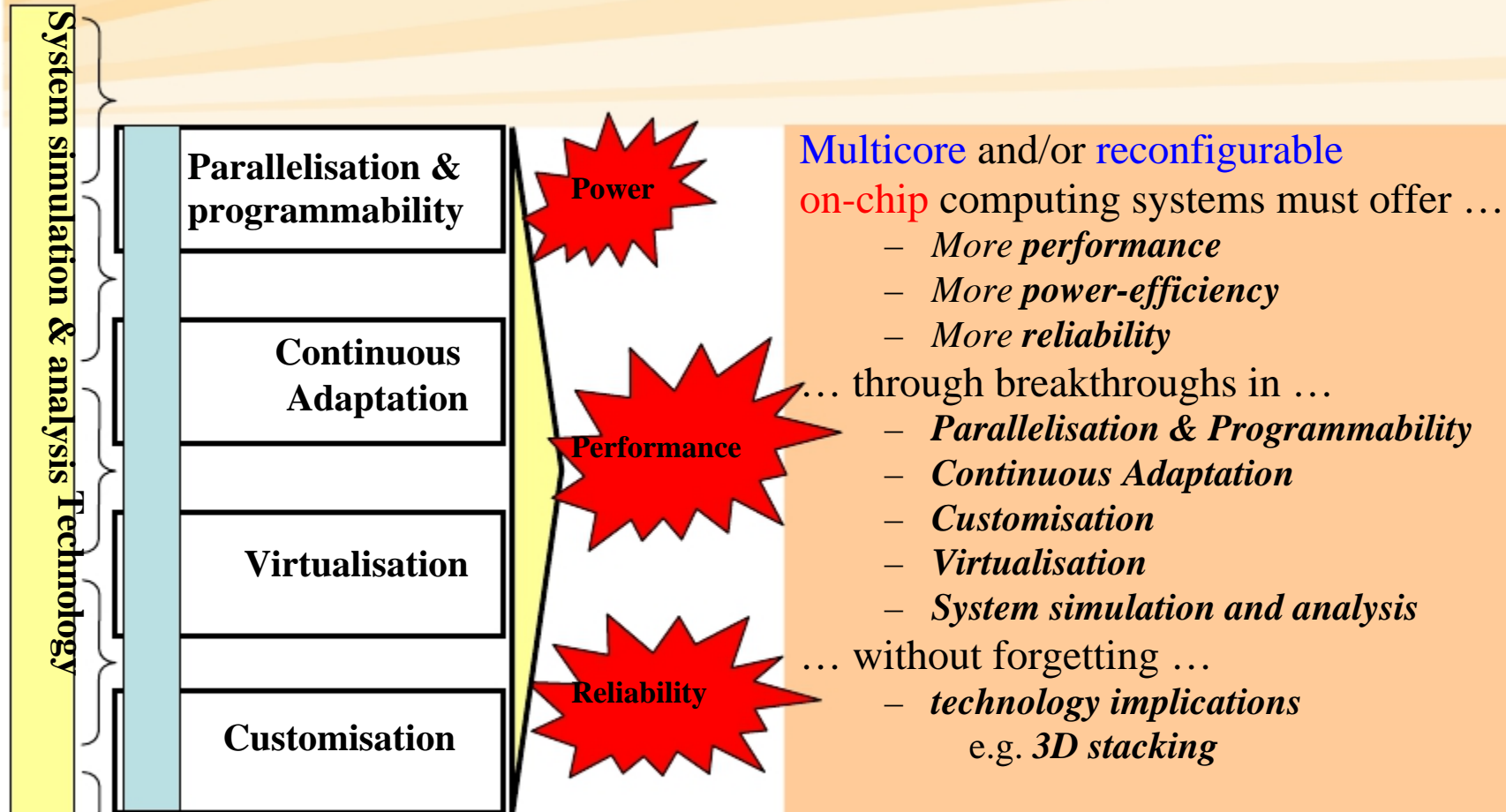
	5. ICT for health	6. ICT for a low-carbon	7. ICT for enterprise and manufacturing	8. Digital libraries & learning
1. Network and service infrastructures				
Future Internet PPP				
2. Cognitive systems, interaction, robotics				
3. Components, systems, engineering	*"Computing Systems" is here*			
JTIs (ARTEMIS, ENIAC)				
4. Content & media technologies				

Industry/Technology needs

Future and Emerging Technologies (FET)

••• 12

Content of 2009 *Computing Systems* Call

System simulation & analysis Technology

- Parallelisation & programmability
- Continuous Adaptation
- Virtualisation
- Customisation

Power

Performance

Reliability

Multicore and/or reconfigurable
on-chip computing systems must offer …
- *More performance*
- *More power-efficiency*
- *More reliability*

… through breakthroughs in …
- *Parallelisation & Programmability*
- *Continuous Adaptation*
- *Customisation*
- *Virtualisation*
- *System simulation and analysis*

… without forgetting …
- *technology implications*
  e.g. *3D stacking*

Budget: 25m

2009 Call Computing Systems
Analysis (1)

Funding schemes (target outcomes)	Received	Above threshold	Retained/ Reserve
STREP (a-d)	40	29	9/1
CSA (e)	2	1	1/0

30% more proposals received than in previous Call-1

Very high quality of received proposals: every 3 out of 4 proposals scored above threshold

Good coverage of the target outcomes - area of "*parallelisation and programmability*" attracted most of the interest

Computing Systems 2009 Call – Retained Proposals
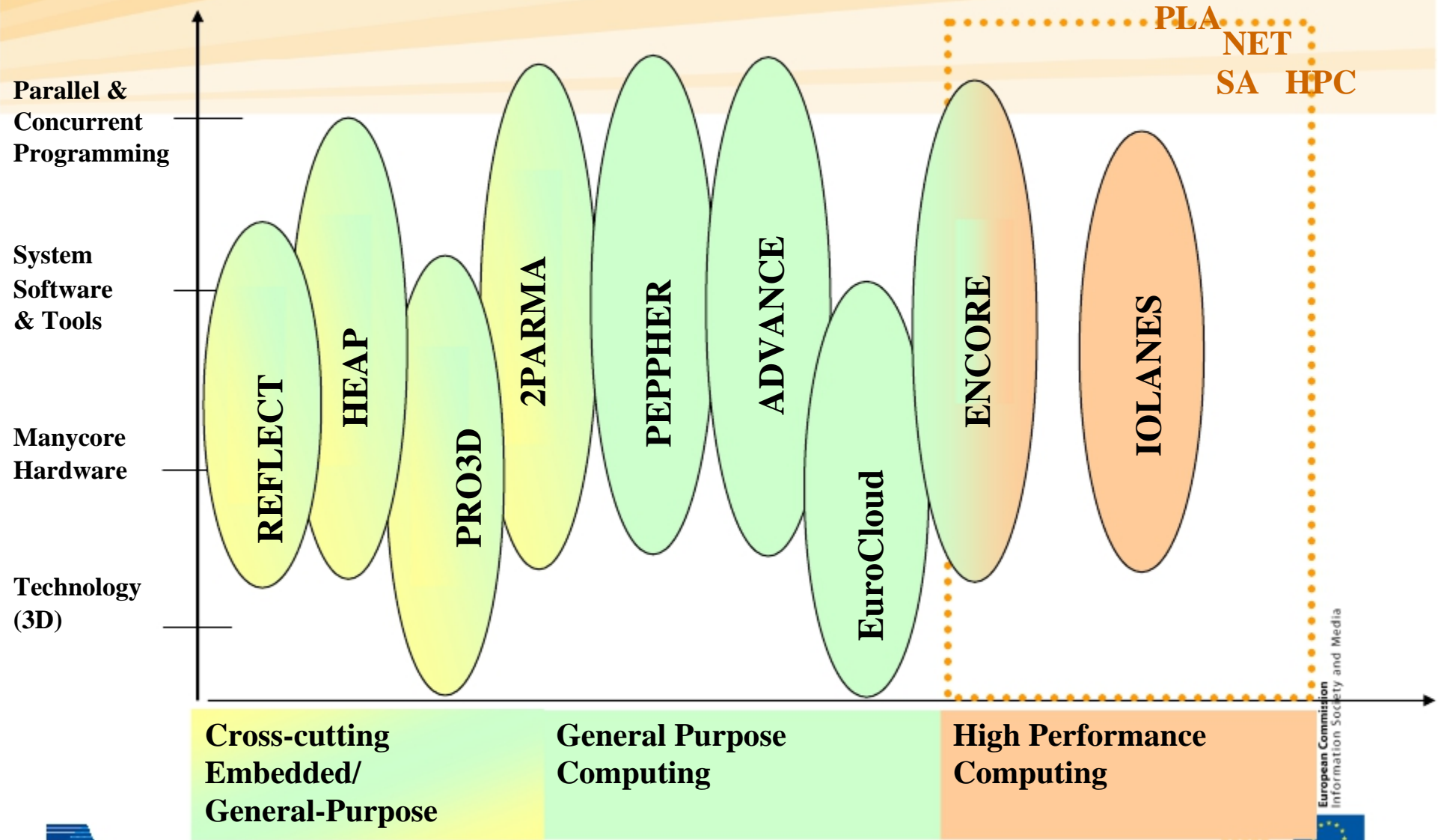
Computing Systems

Call 7

Computing Systems in next Call:
45m funding

- Significantly increased budget reflects the importance of the multicore transition

- The European Computing research community must now deliver high-quality high-impact proposals

Next Call in Computing Systems

- Builds on the results & content of the previous calls

- Call opens 28 September 2010

- Deadline 18 January 2011

- Projects starting mid 2011 & ending 2014.

The Preparation for call 7

- Input from:
  - Consultation workshops
    cordis.europa.eu/fp7/ict/computing/events_en.html
    - 25 June 2009 on Analysing European Success in Computing Systems Research
    - 29 September 2009 on Virtualisation
    - 16-17 November 2009 on Computing Systems overall
    - 14 December 2009 on high-performance computing
  - Analysis of previous Call results and project achievements
  - HIPEAC research vision
  - Member states and FP7 associated states

Overview of research topics in next call

a)   Parallel & Concurrent Computing
  - Multicore, multichip (beyond single-chip)
  - Parallel/concurrent software & tools

b)   Virtualisation
  - Heterogeneous multicore systems

c)   Customisation
  - Reconfigurable architectures
  - Multicore on single-chip
  - Tool-chains
  - System modelling & simulation

d)   Architecture & Technology
  - 3D stacking
  - Alternative computation models

e)   International collaboration

STREPs (40m)

NoE (4m)

CSAs (1m)

Instruments: STREPs, NoE, CSAs

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a) Parallel and Concurrent Computing

- Automatic parallelisation, new high-level parallel & concurrent programming languages and/or extensions to existing languages (including their runtime implementation) that provide portable performance taking into consideration that <u>user uptake is a crucial issue.</u>
- Projects should go <u>beyond on-chip, off-chip boundaries</u> addressing the challenges of programming, testing, verification and debugging, performance monitoring and analysis, low-power and power management especially for <u>large scale parallel systems and data centres</u>, and <u>heterogeneous and accelerator-based multi-core systems.</u>
- Research priorities include:
  - domain-specific languages;
  - concurrent algorithms and transformation of concurrency to parallelism through adaptive compilers and runtime systems;
  - new verification and optimisation environments for parallel software;
  - efficient execution exploiting heterogeneous cores;
  - new approaches to scalability of high-performance computing application codes.

b) Virtualisation

- Virtualisation technologies that are ensuring task isolation and optimised resource allocation as well as guaranteeing performance, timing and reliability constraints.

- The focus is on full virtualisation solutions for heterogeneous multicore platforms including the design of virtualisation-ready heterogeneous multicore hardware platforms and support for accelerator virtualisation.

(c) Customisation

- Unifying hardware design and software development with emphasis on rapid discovery and production of optimal customisations of <u>heterogeneous single-chip multicore systems and associated tool-chains for particular applications</u>.
- Research priorities include:
  - reconfigurable, flexible, soft or hybrid architectures and instruction sets;
  - automatic tool-chain generation;
  - system modelling and simulation, including performance predictability;
  - efficient exploration of the customisation space;
  - low-power and customisation for power efficiency;
  - parallel programming for single-chip multicore architectures;
  - architectural and system-level reliability techniques to counter increasingly probabilistic behaviour of transistors in lower geometries.

d) Architecture and Technology

- The focus is on the impact of next-generation chip fabrication technology on system architectures, tools and compilers.

- Research areas include:
  - implications of 3D stacking;
  - alternative (non von Neumann) models of computation.

- The key challenge is to bridge parallel computing architectures and chip fabrication technology.

e) International Collaboration

- The purpose is to analyse international research agendas and to prepare concrete initiatives for international collaboration for all topics of the objective, in particular with:

  - USA,
  - India,
  - China
  - Latin America

- Separate proposals per geographic area are expected.

Only CSAs

Expected impacts

- Drastically improved programmability of future parallel multicore/multichip computing systems, providing efficient execution and portable performance of codes on a large variety of computing platforms

- Efficient and ubiquitous use of virtualisation for heterogeneous multi-cores.

- Accelerated system development and production, enabling new products to be realised with a considerably shorter time-to-market.

- Reinforced European excellence in multi-core computing architectures, system software and tools.

- Strengthened European leadership in cross-cutting technologies that are applicable to different market segments of computing systems and, in particular, European leadership in parallel computing systems for large data centres.

More information:

Computing Systems Research Objective

– *Home page*
    cordis.europa.eu/fp7/ict/computing/home_en.html

– *Events and Consultation Workshops:*
    cordis.europa.eu/fp7/ict/computing/events_en.html

Email: Panagiotis.Tsarchopoulos@ec.europa.eu
        Rolf.Riemenschneider@ec.europa.eu

Technologies for digital content and languages

50 M€

4.2: Language technologies

– allowing people to access and use online content and services across language barriers, in their preferred language

- human language as communication means: multilingual content processing
- as information: information access & mining
- as interaction: natural spoken interaction
- roadmaps, evaluation & standards

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ICT for health
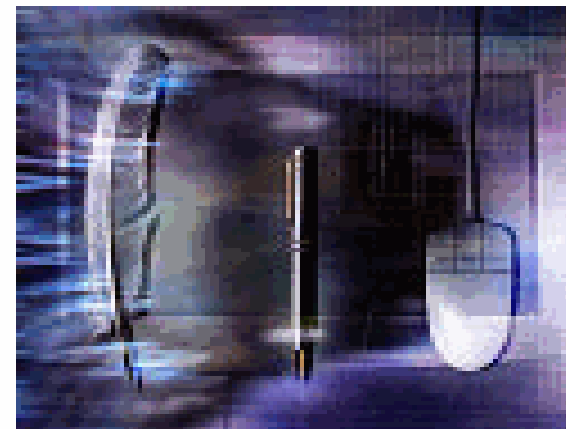
- **5.1: Personal Health Systems (PHS)**

60 M€
  - remote management of diseases, rehabilitation and treatment at the point of need
  - analysis of multi-parametric data

- **5.2: Virtual Physiological Human (VPH)**

1.5 M€
  - CSA to develop roadmap for grand challenge on "Digital Patient"
    - patient-specific models for better prediction and treatment of diseases
  - + 66.5 M€ in ICT Call 9
    - focused on more elaborate and reusable multi-scale models and a VPH information infrastructure of larger repositories

- **5.3: Patient Guidance Services (PGS)**

35 M€
  - enable patients' active participation in care processes
  - semantic interoperability to enable integration of patient information from multiple sources and locations
  - ubiquitous and secure access to personal EHR

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ICT for ageing well, inclusion and governance

- **5.4: ICT for Ageing and Well-being**

  37 M€
  - service and social robotics and highly intelligent environments
  - self-learning, context-awareness, adaptation, user interaction ...
  - complementary to the Ambient Assisted Living (AAL) Programme

- **5.5: ICT for smart and personalised inclusion**

  35 M€
  - solutions for social and economic inclusion through inclusive design, accessible, personalisable and human-ICT interfaces
  - social computing and solutions for learning and skills acquisition
  - Brain-Neural Computer Interfaces

- **5.6: ICT solutions for governance and policy modelling**

  25 M€
  - to help deal with future scenarios involving greater complexity and citizens involvement
  - modelling, simulation, visualisation ...

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FP7 ICT Objective 5.3
An overview

a)

Patient Guidance Services

b)

Reuse of Clinical Data for clinical research and epidemiology

Security, Semantic interoperability

Security, Semantic interoperability

$a + b = 29\ M€$

c) 3M€
NOE Semantic Interoperabilty and European Health Infostructure Medical Professions, Industry, International & National Organisations, Academia

Terminologies/Ontologies, Health Record Structures, Knowledge bases
Interoperability, Product certification, Template/Archetype validation

d) 3M€
Pre Commercial Procurement -Mobile Access to Patient Portals

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What we do not want

- Isolated short term projects on specific use cases
  - The difficulty of the domain, especially in the knowledge representation stems partly from developing robust generic solutions.
  - Projects (Outcome a) must address the interface between Health Care provider organisations and PHRs

- "Paper" projects
  - Proposals should present clearly the way in which progress and effort will be clearly measurable in terms of delivered software of demonstrable quality and quantifiable and recorded effort.

- Proprietary systems
  - Software, architectures, technologies, services and component reuse should not be linked to a particular supplier (open source could be explored as an option)

# Outcome a) Patient Guidance Services – a few research issues

- Patient Healthcare record
  - Standards and existing solutions?
- Identify needs & Measure effects
- Observe and take into account Health Professionals' reactions
- How to provide sufficiently secure systems
  - How to protect individuals from abusive access to their records (often by the family)
  - How to allow information hiding and yet take the hidden information into account.
  - How to resolve the patient Id Issue
- How to demonstrate that information is trustworthy
  - Other HCP Data
  - What role for patient observations
  - How is non controlled environment (PHS) data trusted
- How to resolve the HCP Id and qualifications issue
- What are the legal restrictions on crossing borders with a personal healthcare record
- What about payment billing and reimbursement
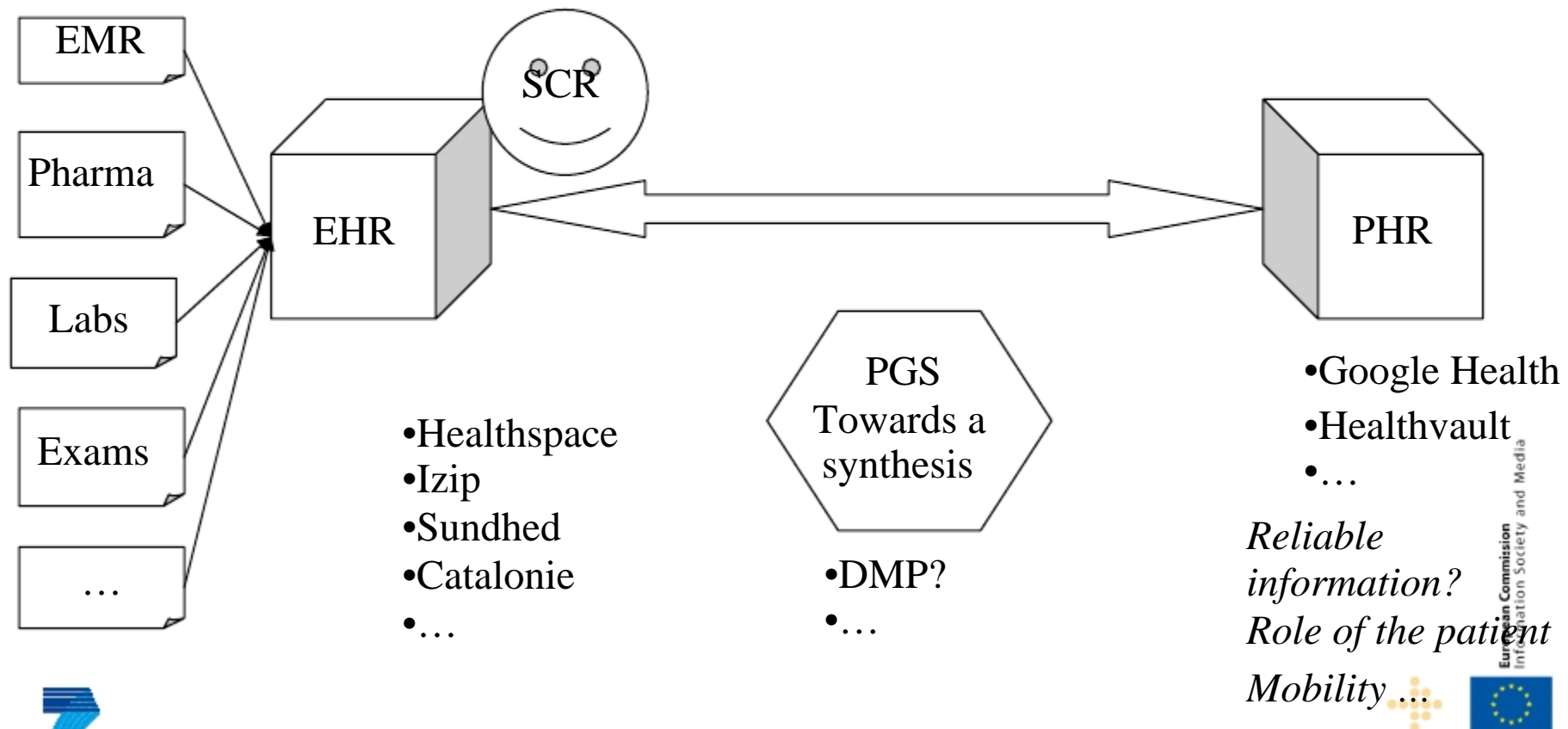- Certification - licensing

Drivers

- Explore and decide on patient services

- Semantic interoperability via intermediation

- Integration for VPH and PHS

- Including the patient contribution

- Guiding on prevention and lifestyle

Patient Health Care Record – at the heart of the guidance services
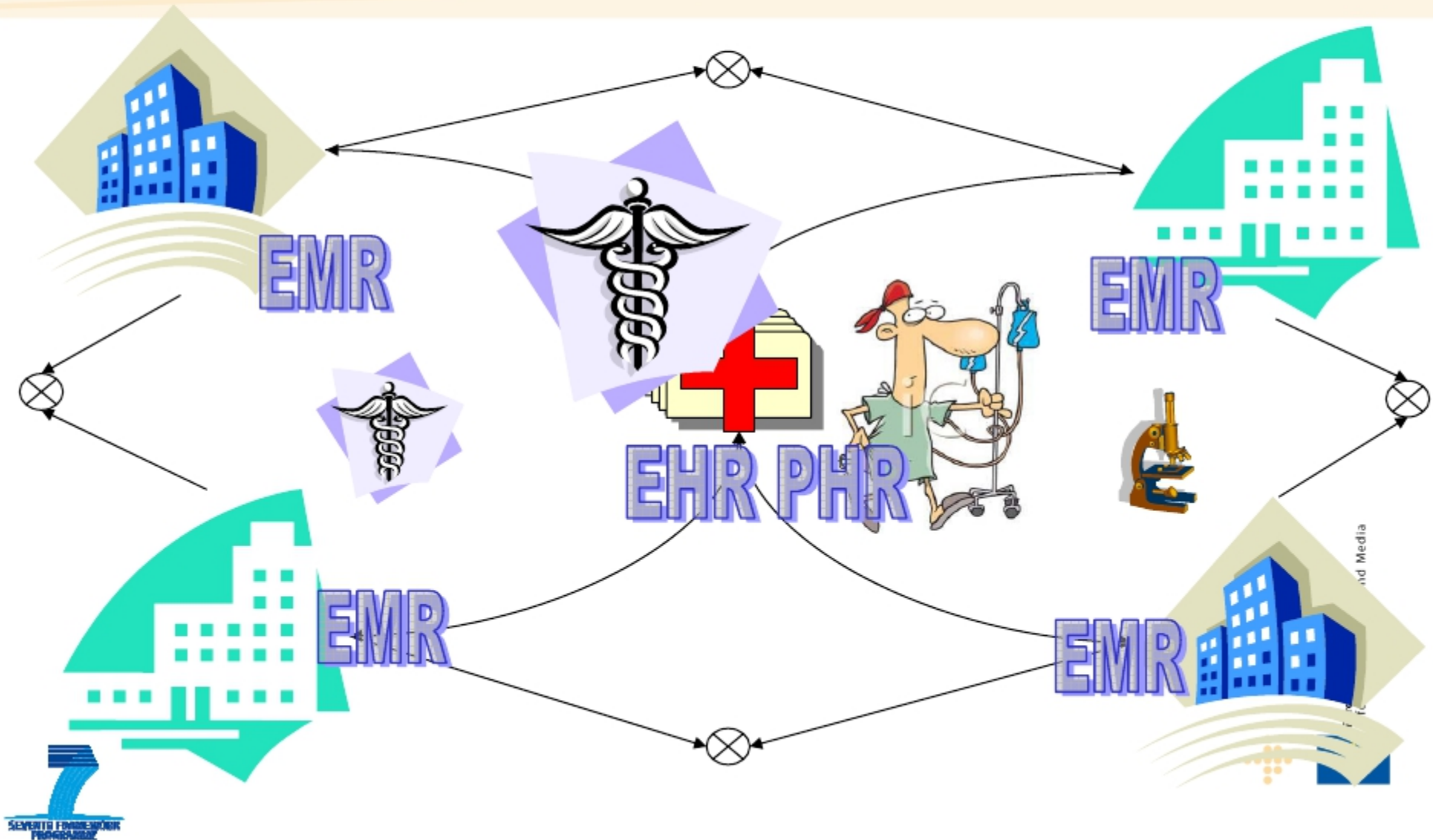
EHR/SCR -> PHR / PGS - towards a synthesis

Trisha Greenhalgh, Katja Stramer, Tanja Bratan, Emma Byrne, Jill Russell, Henry W W Potts. Adoption and non-adoption of a shared electronic summary record in England: a mixed-method case study. BMJ **2010; 340:c3111**

EMR

Pharma

Labs

Exams

…

EHR

SCR

•Healthspace
•Izip
•Sundhed
•Catalonie
•…

PGS
Towards a synthesis

•DMP?
•…

PHR

•Google Health
•Healthvault
•…

Reliable information?
Role of the patient
Mobility …

Some information and services

Consultation / Observation / Actions – finding booking & reminding Physical and virtual consultaiton
Treatment & medication (prescription, dispensation) Administration & Compliance (how to help, how to measure, what to record)
Lab tests/ examinations/ imagery -> Results Follow up – sero-conversion and alarms -> Contagion tracing and informing
Home recording of events (parkinsonian tremors, phone video of seizures, hypo/hyper glycaemia)
Remote ambulatory monitoring – (medical devices)
Access to trusted sources of medical information
Adverse event prevention
Payment and reimbursement

Outcome b) Tools and environments enabling the reuse of Electronic Health Records

- Clinical trials
  - Methodologically can more than inclusion and some follow up be done?
  - Can the semantic gap be closed?
- New methodologies
  - Data mining and pattern recognition in large datasets
  - Cohort studies, phenotype/genotype studies
  - How can the validity be demonstrated and the methodologies be accepted
- Defining the conditions that enable the reuse of clinical data
  - Developing interfaces for quality capture of clinical data
  - Address interoperability issues
- Contribute to and use the infostructure
- Be aware that the Data Protection Conditions are changing

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Outcome c) - Governance

- Network of excellence on semantic interoperability and the European Health Infostructure
  - Infostructure Governance
    - Clinical governance
      - Medical professional organisations
    - Health care record structures
    - Terminologies/ Ontologies
    - Medical Logic/ knowledge bases
      - Guidelines, workflow, models, Clinical Decision support
      - Knowledge base coherence, completeness & non redundancy
  - Virtual organisation (eg. WHO FIC)
  - Testing and certification governance
    - Protection and security
    - Interoperability
    - Product certification

Outcome d) - Innovative services for patients and health professionals

- Based on existing Patient Portals
- Provide Mobile access
- Establish a critical mass of online Personal HealthCare records (PHR)
- Establish the required infrastructure to allow HealthCare Records to be gathered from multiple heterogeneous sources, securely
- Concentrate on security issues
- Concentrate on Identity management
- For multi-lingual presentation **consider** clustering and synergy (*reuse*) with *existing* projects
- The PCP is a new departure and may lead to other initiatives
- Provide a 'Patient Portal in a Box' for Green Field States

What is the rational behind PCP?

Health care

Climate Change

Energy Efficiency

Transport

Security

- Public sector is faced with important **societal challenges**.

- Addressing these, often requires public sector transformations so technologically demanding, that **no commercially stable** solutions exists on the market yet, and forward looking public procurement strategies (incl. procurement of **R&D**) are needed

Pre-commercial procurement
Bridging the innovation gap through public demand pull

- Specific approach for public sector to procure R&D services, enabling
  – Price/quality products that better fit public sector needs
  – Earlier customer feedback for companies developing solutions
  – Better take-up/Wider commercialisation of R&D results
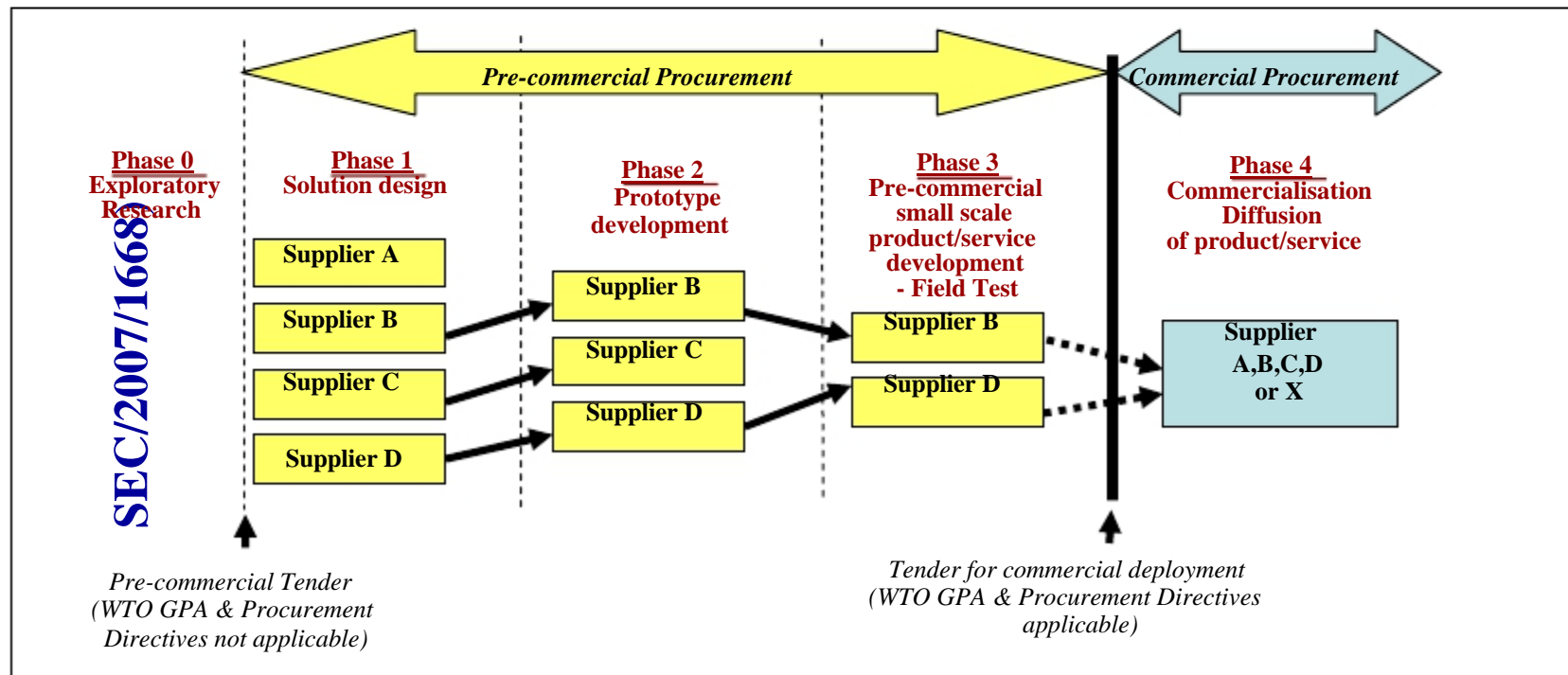
New WP2011-2012 support for PCP

Cross-border PCPs on topics of common EU interest

- Support for consortia driven by public bodies, planning joint implementation of pre-commercial procurements on topics of European interest
- EU contribution: combination of
  – Reimbursement of eligible costs for **preparation, management and coordination** of the joint PCP call for tender (100% funded)
  – Reimbursement of max 50% of the costs for the **development of the new ICT solutions procured through the joint PCP** (for financing of the R&D to be performed by selected tenderers in the PCP)

WP2011-2012 support for PCP
What? How? How Much?

- Two types of calls for PCP Actions
  - Calls focusing on **specific topics of public interest**
    - In ICT for health: objective 5.3(d), call 7
    - Topic: services for <u>mobile access to patient health info</u>
  - **Open call** for any topic of public sector interest
    - Addressing innovative ICT solutions for hea<u>lthcare, e-</u>gov, transport, sustainability, ageing well etc (obj.11.1, call 8)
- Budget on PCP actions: **14Mio EURO total**
  - 3 Mio per area for the specific calls in health, ageing, photonics
  - 5 Mio for the call open to any domain of public sector needs

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More info?

- PCP site: http://cordis.europa.eu/fp7/ict/pcp/home_en.html

Leading actors

- Medical professional organisations

- Patient representation organisations

- Member state health service providers

- Mobile telephone operators

- Standards development organisations

  – Healthcare record standards

  – Terminologies and ontologies

- Healthcare software editors (US & EU)

- Healthcare information providers

More information

- PCP

  http://ec.europa.eu/information_society/activities/
  health/research/infodays_ehealth/index_en.htm

- Outcomes A, B, & C

  http://ec.europa.eu/information_society/activities/
  health/research/infodays_ehealth/index_en.htm

- Proposal pre-screening – In Scope ?
  – Send a short (2 page maximum, less is better) to:
    INFSO-PS@ec.europa.eu

Contact persons

Nigel Strang

nigel.strang@ec.europa.eu

Pre screening Objective 5.3

– INFSO-PS@ec.europa.eu

ICT for a low-carbon economy

- 6.2: ICT systems for energy efficiency

  35 M€
  - energy efficient design and decision support tools
  - optimizing the energy performance during systems development and operation
  - e.g. simulation and planning, enterprise management systems, data centres …

  20 M€ 6.4 : ICT for energy-efficient buildings and spaces of public use
  - building energy management systems
  - interoperation with other ICT-based sub-systems
  - part of Public-Private Partnership on Energy-Efficient Buildings

  50 M€ 6.6: Low-carbon multi-modal mobility and freight transport
  - technologies and services for multi-modal freight and logistics
  - ICT for clean and efficient multi-modal mobility for further improving energy efficiency and reducing CO_2 emissions
  - all modes of transport for passengers and goods

  30 M€ 6.8: ICT for fully electric vehicles (FEV)
  - building blocks of FEV
    - energy storage systems, energy/comm/thermal management, stability control, electric drive, functional safety and durability …
  - integrating FEV with infrastructures
    - vehicle-to-grid interface, vehicle-to-cooperative transport infrastructure integration …
  - part of Public-Private Partnership on Green Cars

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ICT for the enterprise and manufacturing

- **7.3: Virtual factories and enterprises**

  (45 M€)
  – end-to-end integrated ICT for higher management efficiency in networked business operations
  – supporting the emergence of 'smarter' virtual factories/enterprises

- **7.4: Digital factories: manufacturing, design and product lifecycle management**

  (35 M€)
  – engineering platforms
    - info sharing, workflow integration …
  – simulation and virtual prototyping
    - using more accurate digital models …
  – holistic modellling and simulation
    - of full complex products/processes …

If the time still is in sync with me
let break for lunch

FET
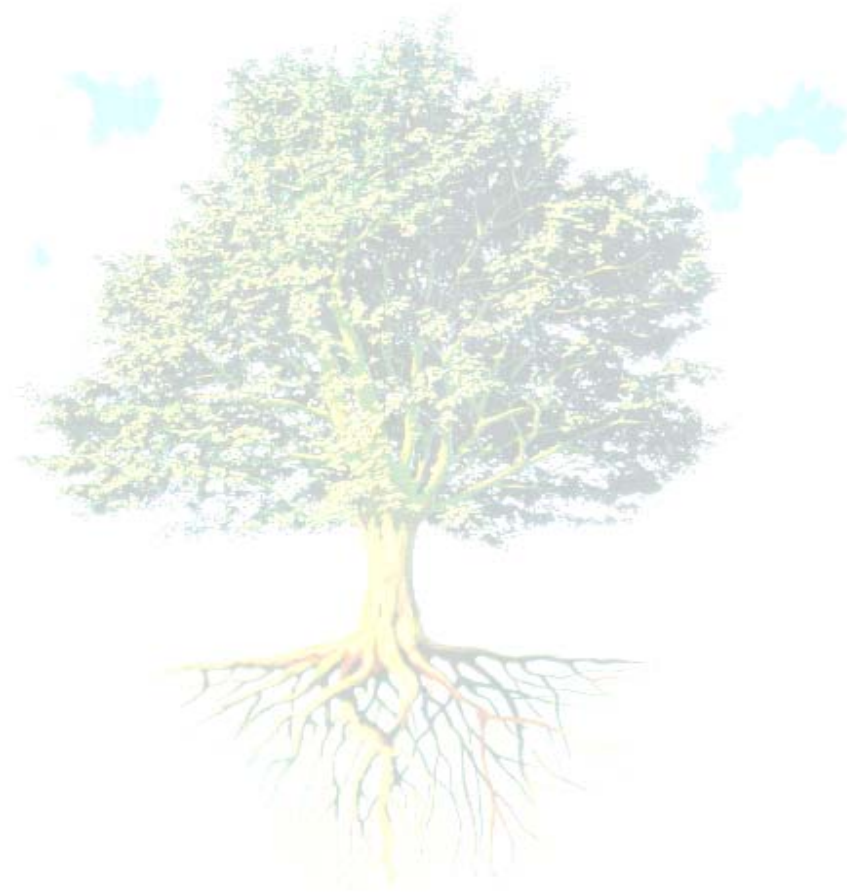
Future and Emerging Technologies

FET Mission
Supporting the emergence of new visionary ICT research

1. Pathfinder and Incubator for exploring new visionary ideas

2. Focusing on long term foundational research

3. Focusing on high risk/high pay-off multi-
   and inter-disciplinary research aiming at S&T breakthroughs

4. Maturing & structuring emerging research fields, research communities and research practices

**FET Proactive + FET Open:
two intertwined successful schemes**

FET: multidisciplinary transformative research

Bringing new science into technology!

Components

Systems

Biology & Life-sciences

Material Sciences

Core ICTs
IT, Communications, Interfaces

Neuro sciences

Social Sciences

Cognitive sciences

Co-evolution of societal and technological change

Intelligence

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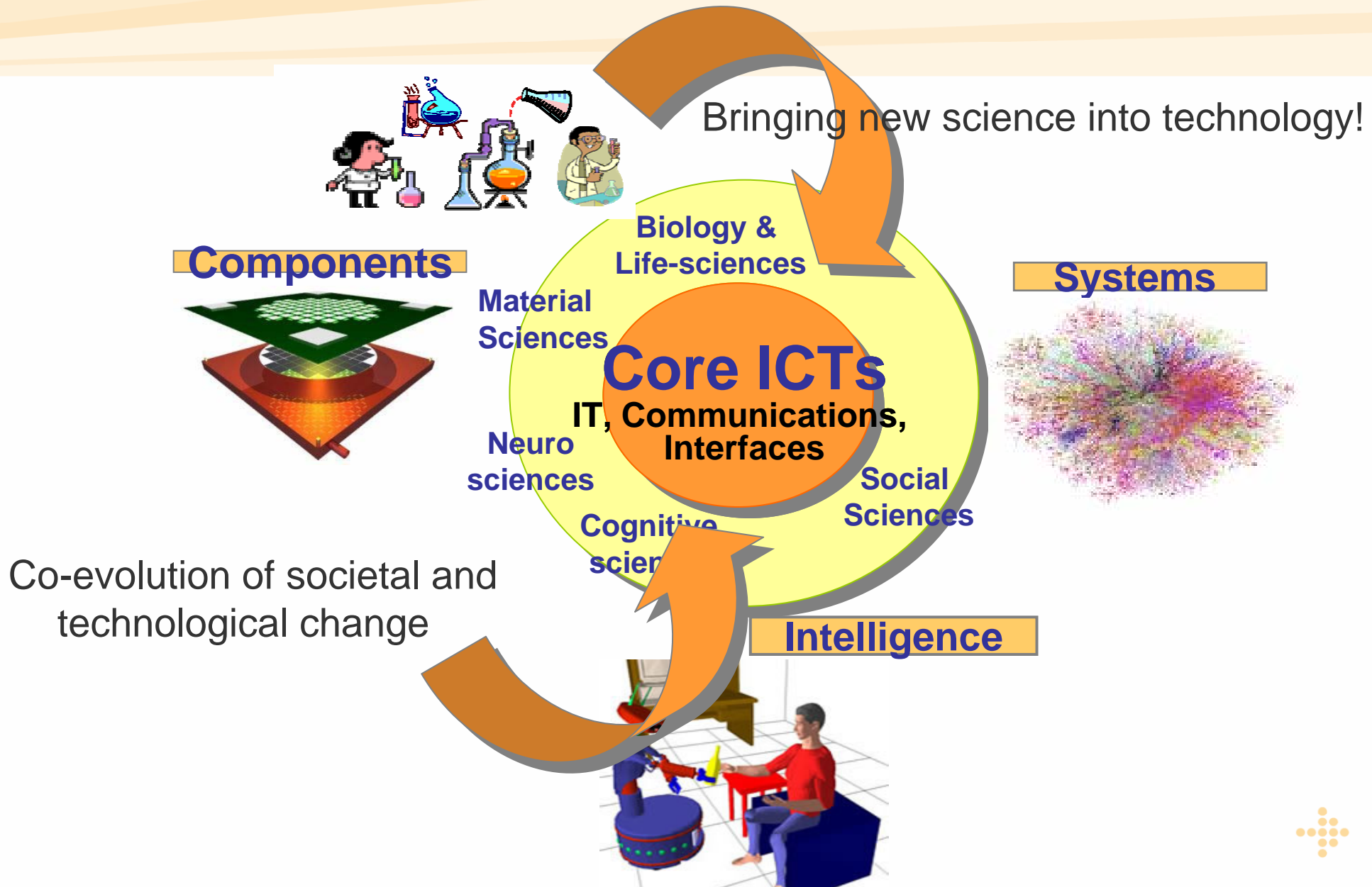
FET Proactive – WP 2011-2012
transformative and foundational research

Call FET-F — **FET Flagship Initiative Preparatory Actions (CSA)** — 10M€

Call 7 — **9.12 ERA-NET follow-up (CSA)** — 2,5M€ — 0,5M€

Call 8
- 9.6 Unconventional Computing (STREP) — 15M€
- 9.7 Dyn. of Multi-Level Complex systems (IP/Strep) — 22M€
  INCO dimension (CSA) — 1M€
- 9.8 Minimising Energy Consumption of Computing to the Limit (Strep) — 15M€

Call 9
- 9.9 Quantum ICT (IP/Strep) — 15M€
  including ERA-NET Plus (ERA-NET-Plus) — 7M€
- 9.10 Fundamentals of Collective Adaptive Systems (IP/Strep) — 23M€
- 9.11 Neuro-Bio-Inspired Systems (IP/Strep) — 22M€
  INCO dimension (CSA) — 1M€

9.12 INCO (CSA)
9.12 Coord. Communities (CSA)
9.12 organising conferences (CSA)
9.12 Identifying new FET topics (CSA)

3M€

3M€

FET Proactive – Special initiatives

- **Preparation for FET Flagships**
  - 9.5: integrate fragmented research efforts around large-scale, visionary & goal-driven, multidisciplinary research initiatives

  10 M€

  Deadline: 2/12/10

- **Coordination and support**
  - 9.12: Coordinating Communities, Identifying new research topics for FET Proactive initiatives and Fostering Networking of National and Regional Research Programmes
  - + 5.5 M€ in ICT Calls 8 and 9

  3 M€

  Deadline: 18/1/11

- **9.13: Exa-scale computing, software and simulation**

  25 M€

  Deadline: 18/1/11

  - computing platforms with potential for extreme performance (100 petaflop/s in 2014 with potential for exascale by 2020)

  - optimised application codes driven by the computational needs of science and engineering of today's grand challenges eg. climate change, energy, industrial design and manufacturing, systems biology
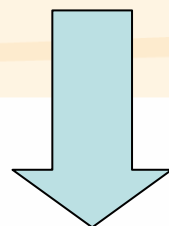
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9

9.12 Coordinating Communities, Identifying new research topics for FET Proactive initiatives and Fostering Networking of National and Regional Research Programmes

Coordination actions

9.12 Coordinating Communities...

(a) Actions supporting coordination and cooperation

– Supporting targeted research communities
  - Organise events
  - Increase visibility and collective impact of scientific community, industry & public
  - Assessing impact
  - Consolidation of research agendas
  - Foster coordination of national, regional and international programmes and activities
  - Encouraging establishment of new educational curricula
– Call 8+9

Research communities can be linked to existing proactives (based around running projects), or communities that are new to FET.

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9.12 Coordinating Communities...

(b) Actions supporting and promoting cooperation with non-EU research teams

- Balanced participation of EU and of target countries
- Stimulate global collaborations with best teams worldwide
- Can be "twinning project"
- Complementing continuous call for INCO-top up, and specific CAs in DYM-CS and NBIS
- Call 8+9

Research communities can be linked to existing proactives (based around running projects), or communities that are new to FET.

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9.12 Coordinating Communities…

(c) Short duration actions to organise consultations of multi-disciplinary communities
- Formulating new FET topics
- Focus on new emerging research areas
- Identify new research avenue and associated fundamental challenge
- Analyse expected impact on science, technology and society
- Call 7+8+9

(d) Actions to organise conferences and workshops
- Fostering dialogue between science, policy and society
- Focus on
  - role of interdisciplinary ICT related long term research
  - Increasing Europe's creativity and innovation base
  - Bridging diverse European research communities and disciplines
- Call 7+8+9

9.12 Coordinating Communities...

(e) ERANET actions

– Fostering networking of future and emerging research activities conducted and national or regional level

– Facilitating mutual opening of national and regional research programmes

– Should involve national and/or regional programme owners

– Call 7

> CHISTERA is an ERANET project started by national funding agencies from 9 member states – call for proposals has just been launched.

Research communities can be linked to existing proactives (based around running projects), or communities that are new to FET.

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Continuous and special calls

Continuous Call

67,5M€   7,5M€

9.1 Challenging Current Thinking (STREP+CSA)

9.2 High-Tech Research Intensive SMEs (STREP)   9M€

9.3 FET Young Explorers (STREP)   6M€

9.4 International Cooperation on FET research (additional funding)   3M€

All FET projects

First batch May 2011

Call 8

9.14 Science of Global Systems   3,5M€

FET Open
Future and Emerging Technologies

75 M€ 9.1: Challenging current Thinking

9 M€ 9.2: High-Tech Research Intensive SMEs in FET research

6 M€ 9.3: FET Young Explorers

3 M€ 9.4: International cooperation on FET research

- Cut-off dates:

Batch	Short STREPs	Full STREPs and CSAs
10	8/6 2010	7/12 2010
11	30/11 2010	17/5 2011
12	3/5 2011	25/10 2011
13	25/10 2011	10/4 2012
14	10/4 2012	25/9 2012
15	11/9 2012	12/3 2013

International collaboration
Horizontal actions

- ## 10.1: EU-Brazil R&D cooperation

  5 M€

  - 5 topics targeted: Microelectronics/Microsystems + Networked Monitoring and Control + Future Internet/experimental facilities + Future Internet/security + e-Infrastructures

  Deadline: 18/1/11

- ## 10.2: EU-Russia R&D cooperation

  4 M€

  - 3 topics targeted: Programming Models and Runtime Support + Performance Analysis Tools for High-Performance Computing + Optimisation, Scalability and Porting of Codes

  Deadline: 12/11/10

- ## 10.3: International partnership building & support to dialogues

  4 M€

  - Support to dialogues with strategic partner countries and regions
  - Analysis of ICT research priorities in third countries, events …

  Deadline: 18/1/11

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Network of NCP, Cooperation in Enlarged EU
Horizontal actions

- **11.2 Trans-national Co-operation Among NCPs**

  4 M€

  - promoting further trans-national cooperation within this network
  - proposals are expected to include or enable the active participation of all NCPs which have been officially appointed by the relevant national authorities (EU + associated countries)

- **11.3: Supplements to Strengthen Cooperation in ICT R&D in an Enlarged EU**

  10 M€

  - reinforce the cooperation across the enlarged EU
  - support to the participation of additional partners in on-going FP7/ICT IP and STREP projects ending after 30 June 2012
  - increase the level of expertise, broaden the scope and/or speed up developments
  - additional partners must be located in countries not already present in the existing consortium
  - funding requested should not exceed 30% of the Commission funding of the existing project or EUR 1 million, whichever is lower

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Thank you