ICT Research in FP7

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FP7 basics

- Knowledge lies at the heart of the European Union's Lisbon Strategy to become the "**most dynamic competitive knowledge-based economy in the world**
- Key pillar for the **European Research Area (ERA)**.
- Links with other Programmes such as the Competitiveness and Innovation Programmes, structural Funds etc

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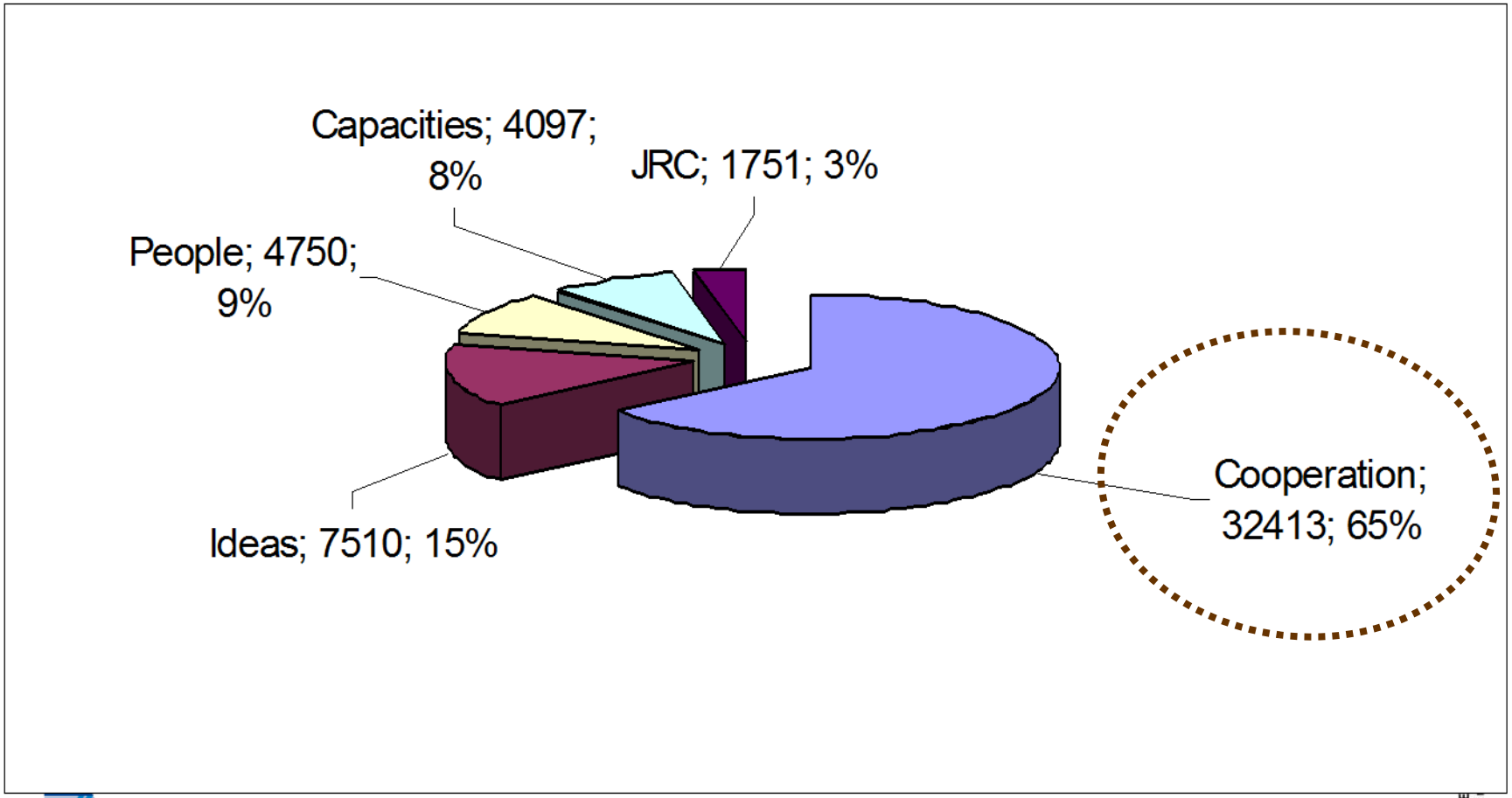
Seventh EU Framework Programme for RTD: total ~50 B€



IDEAS (1)

- Objectives:
  - to reinforce excellence, dynamism and creativity in European research
  - to improve the attractiveness of Europe
    - for the best researchers from both European and third countries
    - for industrial research investment
  - by providing a Europe-wide competitive funding structure, in addition to and not replacing national funding, for ‘frontier research’ executed by individual teams.
  - Communication and dissemination of research results is an important aspect of this programme.

IDEAS (2)

- European Research Council
  - A dedicated implementation structure for the iDEAS specific Programme
  - A scientific Council establishing the overall scientific scientific strategy of ERC
  - Two types of grants:
    - ERC starting independent researcher grants
    - ERC advanced investigator grants

PEOPLE (1)

- Rationale:Abundant and highly trained qualified researchers are a necessary condition to advance science and to underpin innovation, but also an important factor to attract and sustain investments in research by public and private entities.
- Objectives: Strengthening, quantitatively and qualitatively, the human potential in research and technology in Europe
  - by stimulating people to enter into the profession of researcher,
  - by encouraging European researchers to stay in Europe
  - by attracting to Europe researchers from the entire world, making Europe more attractive to the best researchers.

PEOPLE (2)

Activities

- Training *young researchers* to improve their career perspectives in both public and private sectors, by broadening their scientific and generic skills, including those related to technology transfer and entrepreneurship.
- Life-long learning and career development to support *experienced researchers* in complementing or acquiring new skills and competencies or in enhancing inter/multidisciplinarity and/or intersectoral mobility, in resuming a research career after a break and in (re)integrating into a longer term research position in Europe after a trans-national mobility experience.
- Industry-academia pathways and partnerships to stimulate *intersectoral mobility* and increase knowledge sharing through joint research partnerships in longer term co-operation programmes between organisations from academia and industry, in particular SMEs
- International dimension, to contribute to the life-long training and career development of EU-researchers, to *attract research talent from outside Europe* and to foster mutually beneficial research collaboration with research actors from outside Europe.
- Specific actions to support removing *obstacles to mobility* and enhancing the career perspectives of researchers in Europe.

CAPACITIES

- Objective: to enhance research and innovation capacities throughout Europe and ensure their optimal use. The Capacities programme is provided with a budget of EUR 4 097 million to operate in seven broad areas:
- Research infrastructures
- Research for the benefit of SMEs
- Regions of knowledge and support for regional research-driven clusters
- Research potential of Convergence Regions
- Science in society
- Support to the coherent development of research policies
- International cooperation

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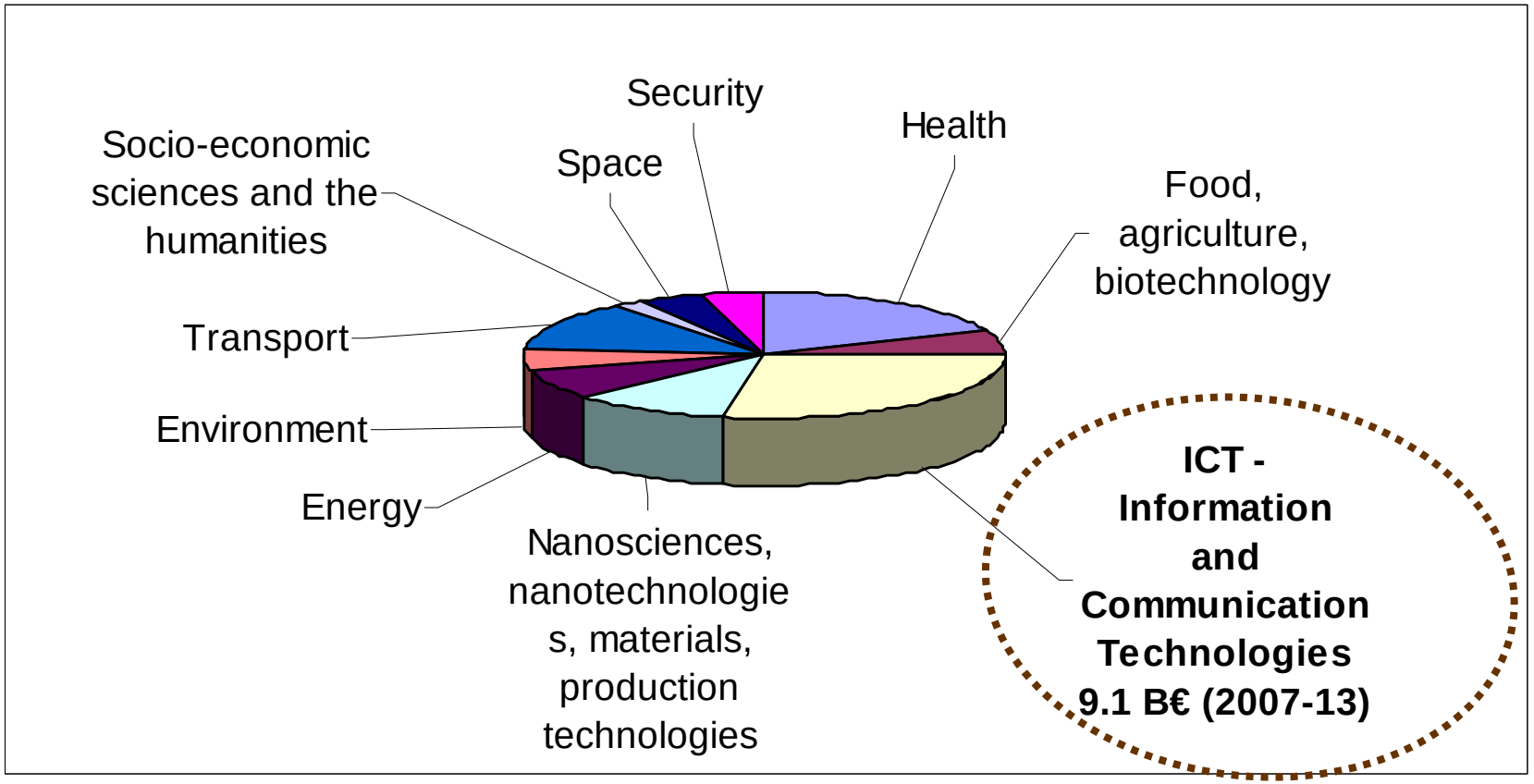
FP7 Cooperation Programme



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Cooperation Programme / Collaborative Research
ICT in FP7 – Objectives

- "To enable Europe to master and shape the future developments of ICT so that the demands of its society and economy are met"

Thereby:

- Strengthen the **competitiveness of all industry** in Europe
  - Master ICT for innovation and growth
- Reinforce the **competitive position of European ICT** sector
  - Build industrial and technology leadership
- Supporting EU policies
  - Mobilise ICT to meet public and societal demands
- Strengthening the European science & technology base
  - A pre-condition for success

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Setting priorities

- In line with
  - EU's i2010 policy for ICT
  - the scope of FP7 Framework and Specific Programmes
- Responding to
  - orientations from Programme Advisory Panel
  - opinions from Programme Management Committee
  - Strategic Research agendas from European Technology Platforms
  - 100+ thematic consultation meetings

WP 2007 Priorities

- Build on Europe technology & industrial assets
  - Telecom, Complexity handling , multi-disciplinarity, largest world ICT market
- Help industry seize new opportunities
  - From new technology paths and from new use of ICT
- Ensure that interventions are significant and that European researchers have the capacities to implement
  - high-risk, medium-to-long term, trans-national collaborative research

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Work Programme approach and structure

- A limited set of *Challenges* (areas) that
  - respond to well-identified industry and technology needs and/or
  - target specific socio-economic goals
- A *Challenge* is addressed through a limited set of *Objectives* that form the basis of Calls for Proposals
  - 3 Calls in 2007
- An *Objective* (topic) is described in terms of
  - target outcome
  - expected impact on industrial competitiveness, societal goals,..
  - applicable funding schemes
- A total of 25 *Objectives* within 7 *Challenges*

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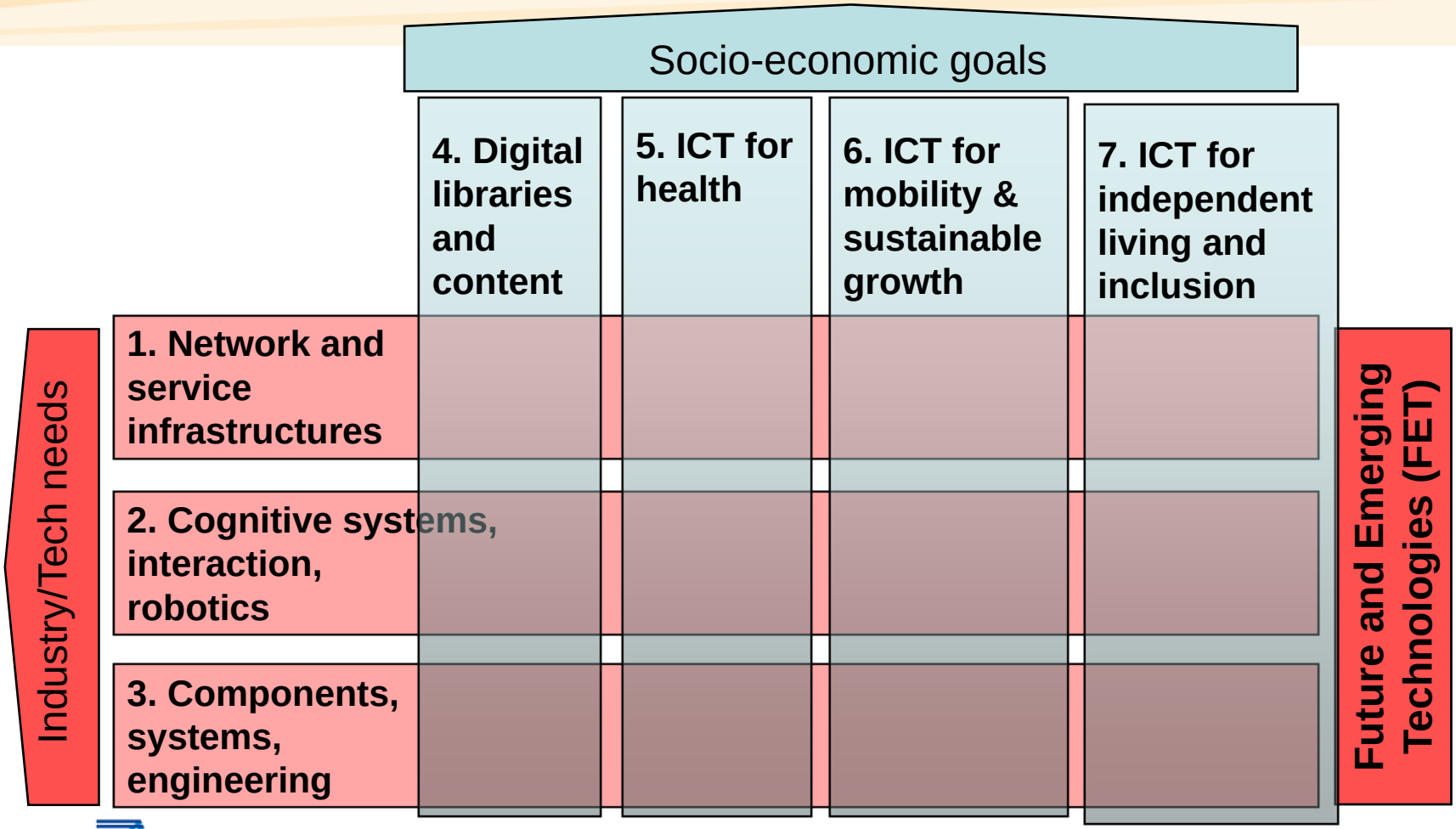
Work Programme 2007 *Challenges*



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Challenge1: Pervasive and trusted network & service infrastructures1

Today	5 – 10 years

• "Convergence" emerging but:
  • user handles separate networks
  • a multiplicity of devices
  • disparate services
• Billions of devices connected
• Security and trust are "added on"
• Robustness/dependability a key hurdle
• Difficulty to cope with the fragmentation of the value chain
	• Anywhere, anytime, any device
	  • seamless, ubiquitous
	  • broadband, mobile
	  • reconfigurable to load/use/context
	• Trillions of devices connected
	• "Built-in" security and trust
	• Highly dependable software and systems
	• Full support to distributed value chains and to the networked enterprise

Challenge 2: Cognitive systems, robotics and interaction

Today

- Robots operating in ‘modelled’, ‘structured’ and ‘constrained’ environments
  - industrial robots
  - ‘programmed’ service robots
- Basic understanding of computational representations of cognitive processes
  - first applications in cognitive vision
- Human-machine interactions that are rather static / passive
  - unable to adapt to human behaviours and to empower humans in their interactions

5 – 15 years

- Robots, machines and systems exhibiting advanced behaviour
  - operating with gaps in knowledge
  - operating in open-ended env.s
  - operating in dynamic / frequently changing environments
- Machines and systems that understand their users / context
  - learning from observation
  - adapting to context
- Systems that analyse and understand multimedia and multimodal digital information
  - all senses, gestures, natural language – ‘human-in-the-loop’

Challenge 3: Components, systems, engineering

Today

- 45 nanometer node
  - 300 mm wafers
- Conventional CMOS Silicon dominate
  - ‘homogeneous’ integration
- Photonics applications emerging
- Design gap for embedded software
- Unable to analyse aggregate behaviours, predict and control systems

5 – 10 years

- Below the 32 nanometer node
  - 450 mm wafers
  - materials, processes, interconnects, design, manufacturing
- New materials, higher levels of integration
  - more heterogeneous (SoC, SiP)
- Wider use of advanced photonics
- Higher productivity in the design of embedded systems / software
- Higher control capacity of large-scale real time embedded systems
- Embedded computing

Challenge 4: Digital libraries and content

Today

- Limited access and usability
  - content not efficiently exploited
  - interactivity limited to smart menus
- Tools for capturing and editing still in their infancy
- Content is not personalised
- Learning tools primarily focus on the delivery of content

5 – 10 years

- "Digital libraries" widely available
  - easy to create, access, interpret, use and preserve content and knowledge
  - cost-effective, reliable, multilingual
- Advanced authoring tools
- Effective semantic-based systems and knowledge management
- Mass-individualisation of learning experiences with ICT (mid-term); adaptive and intuitive learning systems (longer term).

Challenge 5: Towards sustainable and personalised healthcare

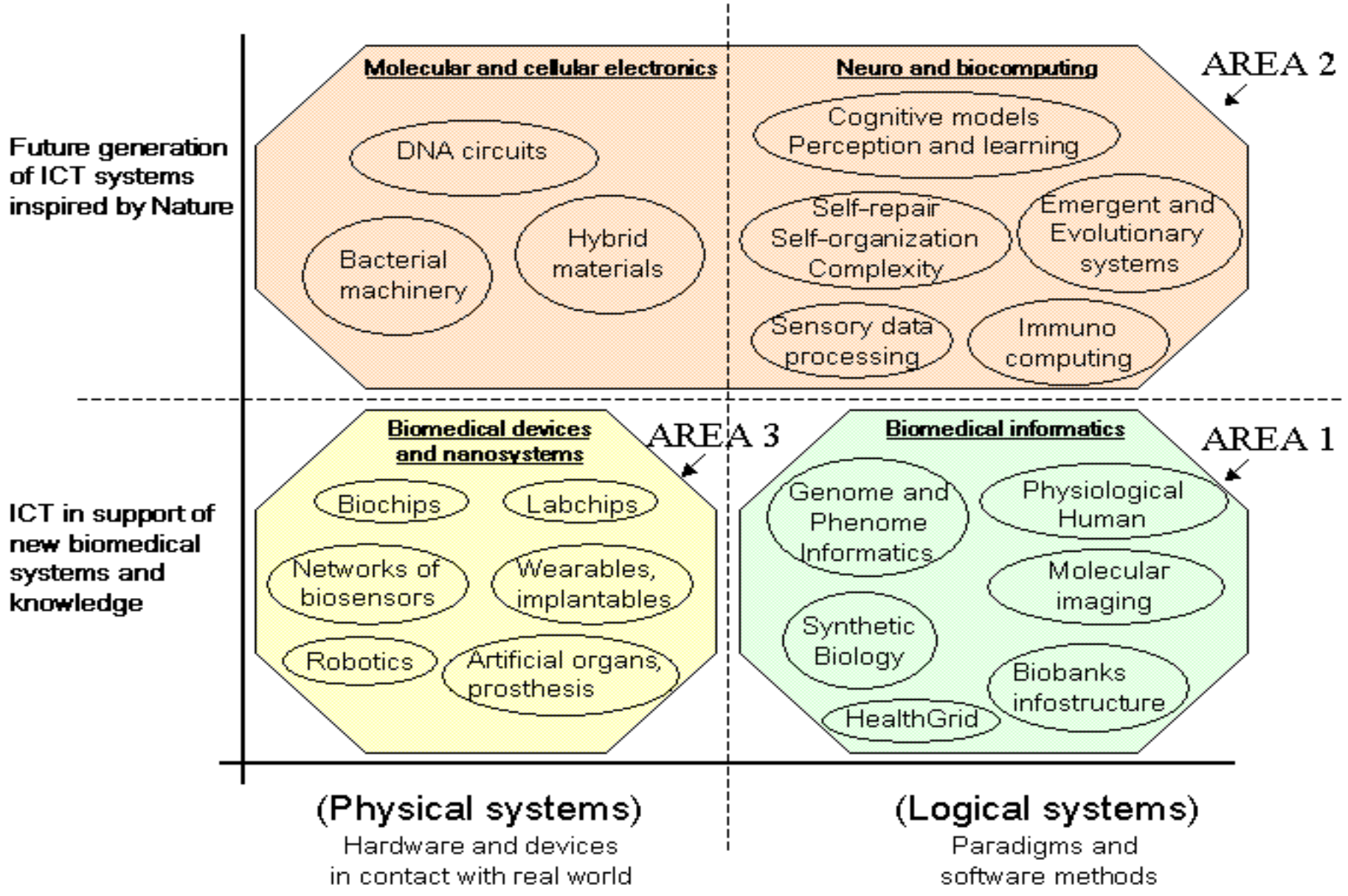
Today

- Citizens, healthy or under treatment, cannot monitor their health
  - no access to comprehensive and secure Electronic Health Records
- Health professionals do not have fast and easy access to patient-specific data @ point-of-need
  - to support diagnosis or plan clinical interventions
- Health authorities do not make sufficient use of information processing systems

5 – 10 years

- Innovative systems and services for personalised health monitoring.
  - e.g. wearable/portable ICT systems
- Efficient systems for point-of-care diagnostics
  - e.g. alert and management support
- ICT-based prediction, detection and monitoring of adverse effects
  - e.g. data mining
- Tools for patient-specific computational modelling & simulation of organs or systems (longer term)

EXTENDING THE SCOPE OF ICT AT THE CROSSROADS WITH LIFE SCIENCES



Challenge 6: ICT for Mobility, environmental sustainability and energy efficiency

Today

- Safety of vehicles and their energy efficiency have improved, but
  - the “zero-accident scenario” is still a distant goal
  - current vehicle active safety (driver warning, hazard detection …) is still limited to stand-alone systems
- Risk management systems provide isolated solutions
  - no co-ordinated ICT-triggered alert of rescue and security forces
- Infrastructures are not sufficiently energy efficient
  - transport, buildings, production plants …

5 – 10 years

- Intelligent Vehicle Systems
  - secure and reliable vehicle-to-vehicle and vehicle-to-infrastructure comm systems
  - optimised traffic management at large scale + mobility services
- Fully integrated management systems / shared data to monitor, warn and react to environmental and other risks
- Intelligent monitoring of energy production, distribution, trading and use

Challenge 7: ICT for Independent Living and Inclusion

Today

- Research on technology for independent living is in its infancy
  - systems for inclusion
  - assistive technology
- Increasing complexity and limited usability of many products and services
  - eAccessibility
- Lack of interoperability between existing inclusive systems
- Lack of interoperability between assistive technologies and mainstream ICT

5 – 10 years

- ICT-based solutions extending independence and prolonging active participation in society
- ICT solutions that help reduce the 30% of the population currently not using ICT
  - user-friendly systems
- Cost-effective, interoperable solutions enabling seamless and reliable integration of devices and services

Future and Emerging Technologies

Objective

- To lay foundations of the ICT innovations of tomorrow
- To foster trans-disciplinary research excellence in emerging ICT-related research domains
- To help emerging research communities to organise and structure their research agenda

Impact

- Pathfinder role: prepare for future ICT directions in the WP
- Create new long-term competitive options for ICT
- Avoid ‘tunnel vision’ in FP7, by exploring unconventional ‘minority’ options and opportunities off the beaten track

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FET structure and content

- FET Open Scheme
  - Open to any foundational ICT-related research
  - High-risk / high-potential impact
  - To shape emerging research communities and agendas
  - Coordination and international cooperation
  - Continuous submissions

- FET Pro-active Initiatives
  - Fundamental cross-cutting long-term challenges in ICT:
    1. Nano-scale ICT devices and systems
    2. Pervasive adaptation
    3. Bio-ICT convergence

    } Call1

    4. Science of complex systems for socially intelligent ICT
    5. Embodied Intelligence
    6. ICT forever yours

    } Call3

Instruments

- Integrated Projects
- STREPs
- Networks of Excellence
- Coordination Actions
- Support Actions

Integrated Project (IP)

IPs are designed to generate the knowledge required to respond to the Challenges of ICT in FP7

- by integrating the critical mass of activities and resources needed to achieve ambitious, clearly defined scientific and technological objectives of a European dimension

Each IP should

- integrate the types of activities needed to obtain the goals
- integrate the critical mass of resources needed to obtain the goals
- integrate elements of the development chain to attain high-impact goals
- support industry-academia collaboration including SMEs

FP6 experience of Integrated Projects

- Purpose: Ambitious objective driven research with a ‘programme’ approach
- Target audience: Industry (incl. SMEs), research institutions. Universities – and in some cases potential end-users
- Typical duration: 36-60 months
- Optimum consortium: 10-20 participants
- Total EU contribution: €4-25m (average around €10m)
- Possibility for competitive calls for enlargement of consortium later

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Small or medium-scale focused research projects - Main characteristics -

- 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
- Two types of activity or combination of the two:

  - A **research and technological development activity** designed to generate new knowledge to improve competitiveness and/or address major societal needs /or
  - A **demonstration activity** designed to prove the viability of new technologies offering potential economic advantages but which can not be commercialised directly (e. g. testing of product like prototypes)

  as well as

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

Small or medium-scale focused research projects - FP6 experience with STREP projects -

- Purpose: Objective driven research more limited in scope than an IP
- Target audience: Industry incl. SMEs, research institutes, universities

- Typical duration: 18-36 months *(14-48 : 32)*
- Optimum consortium: 6-15 participants *(3-22 : 9)*
- Total EU contribution: 0.8 - 3 M€ (average around €1.9M) *(0.5-6.5 : 2.3)*
- Fixed workplan and fixed partnership for duration

Network of excellence

- NoEs are an instrument to overcome the fragmentation of the European research landscape in a given area
- Their purpose is to reach a durable restructuring/shaping 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 given field has changed due to the project, and the extent to which the existing capacities become more competitive as a result of this change

What does a Network of excellence do?

The main activities of an NoE are **integrating activities** and **activities to spread excellence**

- 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
- training researchers and other key staff
- dissemination and communication activities
- networking activities to help transfer knowledge
- where appropriate, promoting the exploitation of the results generated within the network
- where appropriate, innovation-related activities
- (project management)

An NoE may also carry out joint research activities to support its goals

What does a Network of excellence do?

The Joint Programme of Activities (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 within the network
- where appropriate, innovation-related activities

Management activities

FP6 experience of Networks of excellence

- Purpose: Durable integration of participants' research activities
- Target audience: research institutions, universities, Mainly indirectly: industry – through governing boards etc
- Typical duration: 48-60 months (but indefinite integration!)
- Optimum consortium: up to 12 participants
- Total EU contribution: €4-15m (average around €7m)

Support action

Support actions are designed to

- underpin the implementation of the programme
- complement the other instruments,
- help in preparations for future Community research and technological development policy activities and
- stimulate, encourage and facilitate the participation of SMEs, small research teams, newly developed and remote research centres, as well as organisations from International Cooperation Partner Countries in the activities of the ICT theme

Support action proposal may be presented by a consortium or a single organisation, from any country or countries

What does a Support action do?

Support actions may carry out the following types of activity:

- Conferences, seminars, working groups and expert groups;
- Studies, analysis;
- Fact findings and monitoring;
- Trans-national technology transfer and take-up related services;
- Development of research or innovation strategies;
- High level scientific awards and competitions;
- Operational support and dissemination, information and communication activities
- (project management)

Support Actions do not conduct S&T research !

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FP6 experience of Specific support actions

- Purpose: Support to programme implementation, preparation of future actions, dissemination of results
- Target audience: Research organisations, universities, industry incl. SME
- Typical duration: 9-30 months
- Optimum consortium: 1-15 participants
- Total EU contribution: €0.03-3M (average around €0.5M)

Coordination action

Coordination actions are designed to promote and support the networking and co-ordination of research and innovation activities at national, regional and European level over a fixed period

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

What do Coordination actions do?

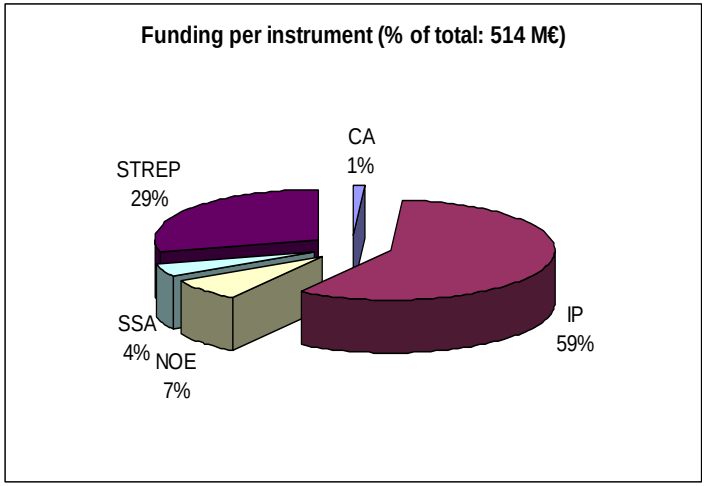
Coordination actions may carry out the following types of mid/long term collaborative activities

- organisation of conferences, of meetings
- performance of studies, analysis
- exchanges of personnel
- setting up of common information systems
- exchange and dissemination of good practice
- setting up of expert groups
- definition, organisation, management of joint or common initiatives
- project management

Coordination actions do not conduct S&T research!

French Participation in IST FP6

- Total EC funding: 514,2 M€
- Total number of participations: 1585
- Number of project co-ordinations: 172



Organisation	# participations
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE	130
THALES GROUP	96
INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET AUTOMATIQUE	90
FRANCE TELECOM	83
COMMISSARIAT À L' ENERGIE ATOMIQUE	80
ALCATEL GROUP	47
STMICROELECTRONICS	24
EADS GROUP	23
MOTOROLA GROUP	19
GEIE ERCIM	17

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More Information

- FP7: http://ec.europa.eu/fp7/ict
  - Presentations of each objective: http://ec.europa.eu/information_society/events/koln_2007

- FP6: http://cordis.europa.eu/ist