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# FP7 ICT Work Programme

Calls for Proposals in 2007



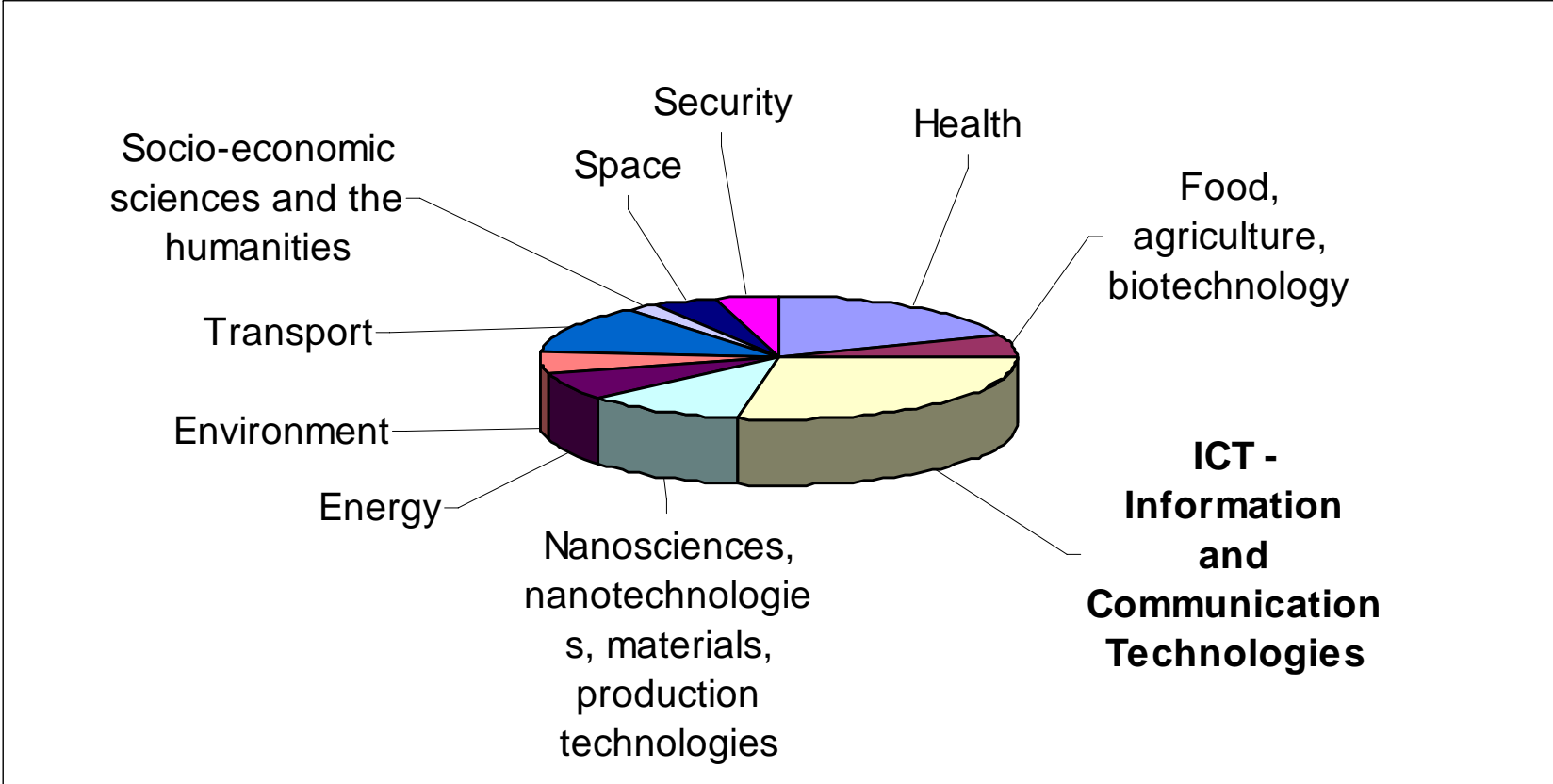
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## Presentation outline

- ICT collaborative research in Framework Programme 7
- Priority-setting for the ICT Work Programme
- ICT Calls for Proposal in 2007
  - Priorities
    - what's at stake and what can we build on
    - what are the targets
  - Implementation details

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# FP7 Cooperation Programme



European Commission  
Information Society and Media



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# ICT – The largest priority theme of FP7

- ICT Technology Pillars
  - pushing the performance and functionality of technology
- Integration of Technologies
  - integrating multi-technology sets that underlie new services
- Applications Research
  - providing the knowledge and the means to develop a wide range of innovative ICT applications
- Future and Emerging Technologies
  - supporting research at the frontier of knowledge

# Priorities based on wide consultations

- Reinforce Europe's strongholds
  - Europe's industry and technology position
- Seize new opportunities for Europe
  - (r)evolutions and potential impacts:  
industrial competitiveness, socio-economic goals
- Ensure that interventions are significant and that Europe has the capacities to implement
  - high-risk, medium-to-long term, trans-national collaborative research

# Reinforce Europe's strongholds

- Network and service infrastructures
  - communication equipment and services, business software, security solutions ...
- Components and embedded systems
  - semiconductors, equipment, photonics, plastic electronics, integrated micro/nano systems ... embedded systems in vertical markets: cars, planes, medical, telecom ...
- A strong academic research community
  - in core ICT fields and in other disciplines relevant for ICT: biotech, materials, cognitive sciences ...

# Seize new opportunities for Europe

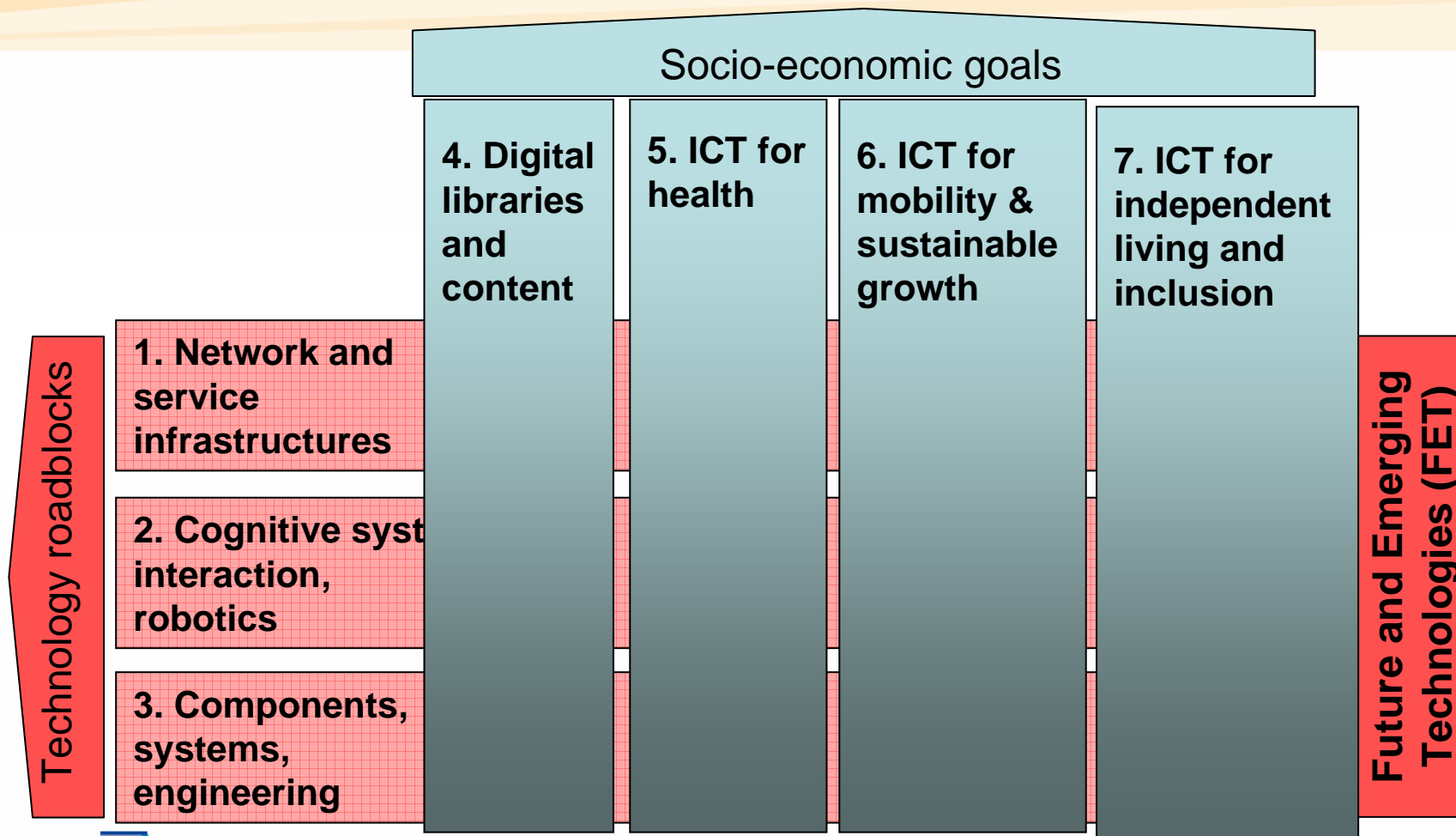
- New technology paths
  - more “intelligent” technology: ICT systems that learn & reason, that contextualise & adapt, that interact & act autonomously
  - driven by developments in cognitive systems, sensing and interaction and advanced robotics
- Growing demand and new ways of using ICT
  - digital content and knowledge creation and use
  - sustainable and personalised healthcare
  - intelligent and safe transport, sustainable development
  - independent living and inclusion

# Work Programme approach and structure

- A limited set of *Challenges* aiming at
  - overcoming technology roadblocks to achieve specific characteristics, and/or
  - end-to-end systems targeting specific socio-economic goals
- A *Challenge* is addressed through a limited set of Objectives that form the basis of Calls for Proposals
- An Objective is described in terms of
  - target outcome - in terms of characteristics
  - expected impact - in terms of industrial competitiveness, societal goal, technology progress etc.
- A total of 24 Objectives expressed within  
*7 Challenges*

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# Work Programme 2007 *Challenges*



## Challenge 1: Pervasive and trusted network & service infrastructures

- Network and service infrastructures underpin economic progress and the development of our societies
  - 2 billion mobile terminals in commercial operation, 1 billion Internet users, 400 million internet enabled devices
- A growing and changing demand
  - for increasing user control of content/services
  - for networking 'things' - TV/PC/phone/sensors/tags ...
  - for convergence: networks|devices|services - video/audio/data/voice/.
- Current technologies can be, and need to be improved significantly
  - for scaling up and more flexibility
  - for better security, dependability and robustness
  - for higher performance and more functionality
- Europe is well-positioned: industry, technology and use
  - networks equipment and services, business software, middleware, security, home systems ...

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## Challenge 1 targets

Today

- “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

5 – 10 years

- 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

# Challenge 1: Objectives in Calls for Proposals

## ICT Call 1

- The network of the future
- Service and software architectures, infrastructures and engineering
- Secure, dependable and trusted infrastructures
- Networked media

## ICT Call 2

5. New Paradigms and experimental facilities
6. Critical infrastructure protection

## Challenge 2: Cognitive systems, robotics and interaction

- Today's ICT systems cannot learn from experience and reason, cannot contextualise and adapt, and cannot (inter)act based on observation and learning
  - many ICT applications cannot be developed further if there are no new breakthroughs in machine intelligence and systems engineering
- Overcoming such technology roadblocks opens the doors to a wide range of opportunities in new application fields
  - vision/sensing systems, service robots, health robots, industrial robots, multimodal and multilingual interactions ...
- Europe has key assets to build on
  - world leadership in industrial robotics and systems engineering
  - mastering of multiple disciplines: neuroscience, microsystems ...
  - excellent academic research in these fields

## Challenge 2 targets

Today

5 – 15 years

- 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

- 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’

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## Challenge 2: Objectives in Calls for Proposals

### ICT Call 1

- Cognitive systems, interaction, robotics

### ICT Call 3

- Cognitive systems, interaction, robotics

## Challenge 3: Components, systems, engineering

- Electronic systems underpin trillion Euro ICT markets
- Electronic systems are embedded in all artefacts of life
  - 20-40% of the value of new products comes from embedded electronics
  - increasing demand for lower cost, higher performance components
- Europe is currently leading in embedded electronics in a number of industries
  - car safety, engine control, fly-by-wire avionics, telecom equipment, medical equipment, industrial automation ...
- European firms also among top semiconductor manufacturers and equipment companies
- Europe enjoys leading positions in emerging fields
  - photonics, plastic electronics, flexible displays, integrated micro/nanosystems ...

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## Challenge 3 targets

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
  - manufacturing, processes, devices, wafers, materials
- 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

## Challenge 3: Objectives in Calls for Proposals

### ICT Call 1

- Next generation nanoelectronics components and electronics integration
- Organic and large-area electronics and display systems
- Embedded systems design
- Computing systems

### ICT Call 2

5. Photonic components and subsystems
6. Micro/nanosystems
7. Networked embedded and control systems

## Challenge 4: Digital libraries and content

- Growing load of information and content and increasing demands for knowledge and skills
  - in less than 10 years, the average person will be managing terabytes of videos, music, photos, and documents every day
  - digital content production | consumption:  
from “few-to-many” to “many-to-many” models
- Today’s technology provides limited tools for access/interaction, development/creation, delivery/diffusion and preservation of content & knowledge
- Europe, with its unique cultural heritage and creative potential, is well placed to take advantage of technology developments and their use

## Challenge 4 targets

Today

5 – 10 years

- 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

- “Digital libraries” widely available
  - easy to create, interpret, use and preserve resources
  - 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 4: Objectives in Calls for Proposals

### ICT Call 1

- Digital libraries and technology-enhanced learning
- Intelligent content and semantics

### ICT Call 3

- Digital libraries and technology-enhanced learning
- Intelligent content and semantics

## Challenge 5: Towards sustainable and personalised healthcare

- Rising demands on healthcare
  - by 2050 close to 40% of the Union's population will be over 65 years
  - growing expectations of citizens for better care
  - increasing mobility of patients and health professionals
  - need to respond to risks for emerging diseases
- By 2010, ICT for Health spending may account for up to 5% of the EU's total health budget, up from just 1% in 2000
  - need to access, understand and securely manage huge amounts of health information
- ICT is also supporting progress in medical research and a shift towards evidence-based medicine
- European businesses have every opportunity to become leading global players in the new ICT for Health industry

## Challenge 5 targets

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)

## Challenge 5: Objectives in Calls for Proposals

### ICT Call 1

- Personal health systems for monitoring and point-of-care diagnostics
- Advanced ICT for risk assessment and patient safety

### ICT Call 2

3. Virtual physiological human

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

- Growing demand for transport services
  - more congestion, higher energy consumption, pollutant emissions
- Accidents causing fatalities and injuries
  - over 40.000 fatalities on the EU roads every year
- Increasing demand for natural resources
  - 1-2% per year for energy and growing water consumption
- Natural and industrial disasters has doubled in one decade
  - killing 500.000 people and causing 700 billion of damage
- Europe's industry is one of the most competitive
  - automotive, transportation, civil protection, equipment supply

## Challenge 6 targets

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 6: Objectives in Calls for Proposals

## ICT Call 1

- ICT for the intelligent vehicles and mobility services

## ICT Call 2

2. ICT for cooperative systems
3. ICT for the environmental management and energy efficiency

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## Challenge 7: ICT for Independent Living and Inclusion

- Between 1998 and 2025 the proportion of the population classified as elderly will increase from 20% to 28%
  - more people with high disability rates
  - smaller productive workforce
- Need for a paradigm shift in health and social care and new requirements for inclusion, accessibility and usability
- Complexity and lack of accessibility and usability of many ICT-based products and services is a major barrier for many people
- A major economic opportunity for European industry

## Challenge 7 targets

Today

5 – 10 years

- 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

- 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

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# Challenge 7: Objectives in Calls for Proposals

## ICT Call 1

- ICT and ageing

## ICT Call 2

### 2. Accessible and inclusive ICT

# 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

# FET structure and content

- FET Open
  - Open to any foundational ICT-related research
  - High-risk / high-potential impact
  - To shape emerging research communities and agendas
  - Coordination and international cooperation
  - Continuous submission, CP (STREP only), CSA (CA only)
- FET pro-active
  - Fundamental cross-cutting long-term challenges in ICT:
    1. Nano-scale ICT devices and systems
    2. Pervasive adaptation
    3. Bio-ICT convergence
    4. Science of complex systems for socially intelligent ICT
    5. Embodied Intelligence
    6. ICT forever yours

# Horizontal support actions

- International cooperation
  - to pave the way for strategic partnerships in view of developing global standards and interoperable solutions and strengthening EU competitiveness
  - to widen the diffusion of the information society, especially in developing countries and strengthened the EU policy for development
- Trans-national co-operation among National Contact Points
  - one proposal including officially appointed NCPs
  - to improve NCP service across Europe
  - to help to simplify access to FP7 calls
  - to lower the entry barriers for newcomers
  - to raise the quality of submitted proposals

# Funding schemes

- Collaborative projects (CP)
  - to develop new knowledge, new technology, products, demonstration activities
  - Two types: Small or medium-scale focused research actions (STREP), Large-scale integrating projects (IP)
- Networks of Excellence (NoE)
  - to strengthen S&T excellence and to increase efficiency in the use of resources by restructuring/integration of capacities
- Coordination and support actions (CSA)
  - aimed at coordinating or supporting research activities and policies (networking, exchanges, coordination of funded projects, studies, conferences, etc)
  - Two types: Coordination Actions (CA), Support Actions (SA)

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# ICT Call 1 – Open: Jan/Feb 2007 Close: 24 April 2007

## **Challenge 1:**

	<b>Budget</b>
1. The network of the future	200 M€
2. Service and software architectures, infrastructures and engineering	150 M€
3. Secure, dependable and trusted infrastructures	90 M€
4. Networked media	85 M€

## **Challenge 2:**

1. Cognitive systems, interaction, robotics	96 M€
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## **Challenge 3:**

1. Next generation nanoelectronics components and electronics integration	86 M€
2. Organic and large-area electronics and display systems	63 M€
3. Embedded systems design	40 M€
4. Computing systems	25 M€



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# ... ICT Call 1 + FET-Open

## **Challenge 4:**

1. Digital libraries and technology-enhanced learning	52 M€
2. Intelligent content and semantics	51 M€

## **Challenge 5:**

1. Personal health systems for monitoring and point-of-care diagnostics	72 M€
2. Advanced ICT for risk assessment and patient safety	30 M€

## **Challenge 6:**

1. ICT for the intelligent vehicles and mobility services	57 M€
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## **Challenge 7:**

1. ICT and ageing	30 M€
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## **FET proactive:**

1. Nano-scale ICT devices and systems	20 M€
2. Pervasive adaptation	20 M€
3. Bio-ICT convergence	20 M€

## **Horizontal support actions**

International cooperation	6 M€
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Trans-national co-operation among NCPs	2 M€
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FET-Open (separate Call for Proposals)	65 M€
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# ICT Call 2 – Open: May/Jun 2007 Close: Sep/Oct 2007

## **Challenge 1:**

- |  | <b>Budget</b> |
|--|---------------|
| 5. New paradigms and experimental facilities                       | 40 M€         |
| 6. Critical infrastructure protection (+20 M€ from Security theme) | 20 M€         |

## **Challenge 3:**

- |   |       |
|---|-------|
| 5. Photonic components and subsystems     | 90 M€ |
| 6. Micro/nanosystems                      | 83 M€ |
| 7. Networked embedded and control systems | 47 M€ |

## **Challenge 5:**

- |                                |       |
|--------------------------------|-------|
| 3. Virtual physiological human | 72 M€ |
|--------------------------------|-------|

## **Challenge 6:**

- |   |       |
|---|-------|
| 2. ICT for cooperative systems                            | 48 M€ |
| 3. ICT for environmental management and energy efficiency | 54 M€ |

## **Challenge 7:**

- |                                 |       |
|---------------------------------|-------|
| 2. Accessible and inclusive ICT | 43 M€ |
|---------------------------------|-------|



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# ICT Call 3 – Open: Dec 2007 Close: Mar 2008

## **Challenge 2:**

1. Cognitive systems, interaction, robotics

**Budget**

97 M€

## **Challenge 4:**

1. Digital libraries and technology-enhanced learning
2. Intelligent content and semantics

50 M€

50 M€

## **FET**

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

20 M€

20 M€

20 M€

## **Horizontal support actions**

- International cooperation

6 M€