FP7 ICT Work Programme

Calls for Proposals in 2007
Focus on Call 2 and Call 3

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Presentation outline

- Introduction to FP7
- ICT Work Programme 2007 - *Challenges*
  - What's at stake and what can we build on
  - What are the targets
- ICT Calls for Proposal in 2007
  - *Objectives* and implementation details
  - Focus on Call 2 and Call 3

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The renewed Lisbon strategy

- Markets & Competition: Europe – A more attractive place to invest & work
  - The internal market
  - Improve regulation
  - Competitive markets
  - Expand & improve infrastructure

- Knowledge & innovation for growth
  - Increase R&D investment
  - Facilitate innovation & uptake of ICT & the sustainable use of resources
  - Contribute to a strong industrial base

- Employment & Skills: Creating more & better jobs
  - Employment & social protection systems
  - Flexibility of labour markets
  - Human capital: Better education & skills

Research policy

- Raise R&D investment (3% objective)
- Create a single "market" for research (ERA) and innovation
  - An area of free movement of knowledge, researchers & technology
- R&D excellence
- Improve human capital & skills base
- Build effective research infrastructures
- Aligning Framework Programme (FP) & national R&D programmes

FP7 Specific Programmes 2007 - 2013

"Cooperation"
Collaborative R&D, pre-defined themes, JTIs — € 32.3 bn

"Ideas" NEW
Frontier research, competition, individual grants — € 7.5 bn

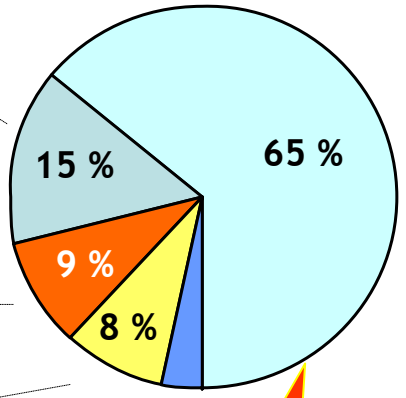
"People"
Human potential, mobility — € 4.7 bn

"Capacities"
Infrastructure, SMEs, science and society — € 4.3 bn

Joint Research Centre (non-nuclear) — € 1.8 bn

+

EURATOM — 3 % — € 2.8 bn
EURATOM Programme — € 1.3 bn



Total
€ 54.6 bn
2007-2013

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FP7 “Cooperation”: Themes

		Budget [mn €]
1.	Health	6,000
2.	Food, Agriculture & Biotechnology	1,935
3.	Information & Communication Technologies	9,120
4.	Nanosciences, Nanotechnologies, Materials & new Production Technologies	3,505
5.	Energy	2,300
6.	Environment (including Climate Change)	1,900
7.	Transport (including Aeronautics)	4,195
8.	Socio-Economic Sciences & the Humanities	610
9.	Space	1,430
10.	Security	1,320
		32,315

… including

- *Joint Technology Initiatives*
- *ERA-Nets*
- *International Co-operation*

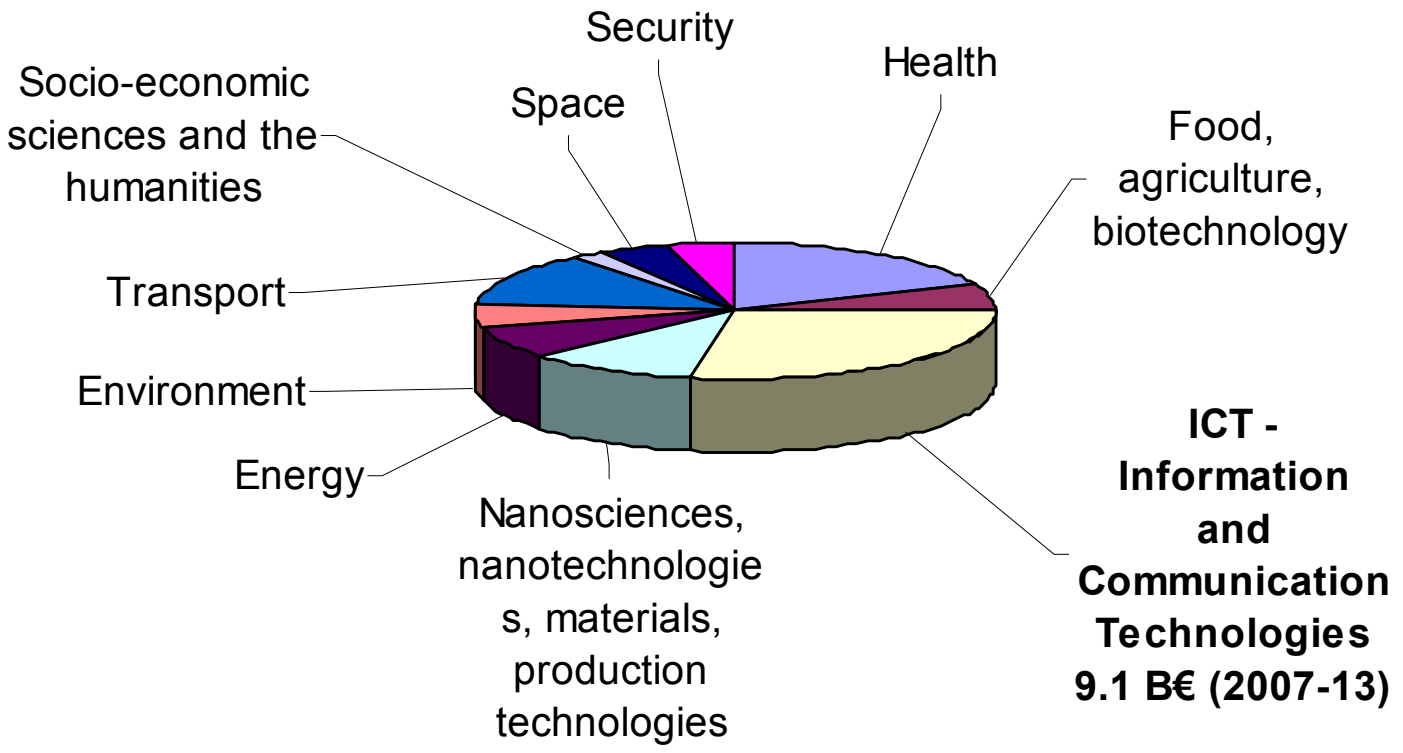
JTIs in FP7: what they are

- Long term public-private partnerships
  - In a very limited number of cases
  - Resulting from the work of ETPs
  - Covering one or a small number of selected aspects of R&D
  - Combine private with European and national funding
  - Legal basis: Article 171 of the Treaty
- Criteria
  - Inability of existing instruments to achieve objectives
  - Impact on industrial competitiveness
  - Strength of commitment from industry
  - Capacity to attract additional national support and leverage industry funding
  - …

Indicative list of JTIs in FP7

- Innovative Medicines Initiative (IMI)
- Nanoelectronics Technologies 2020 (ENIAC)
- Embedded Computing Systems (ARTEMIS)
- Aeronautics and Air Transport (“Clean Sky”)
- Hydrogen and Fuel Cells Initiative
- GMES

FP7 Cooperation Programme



ICT: Setting priorities

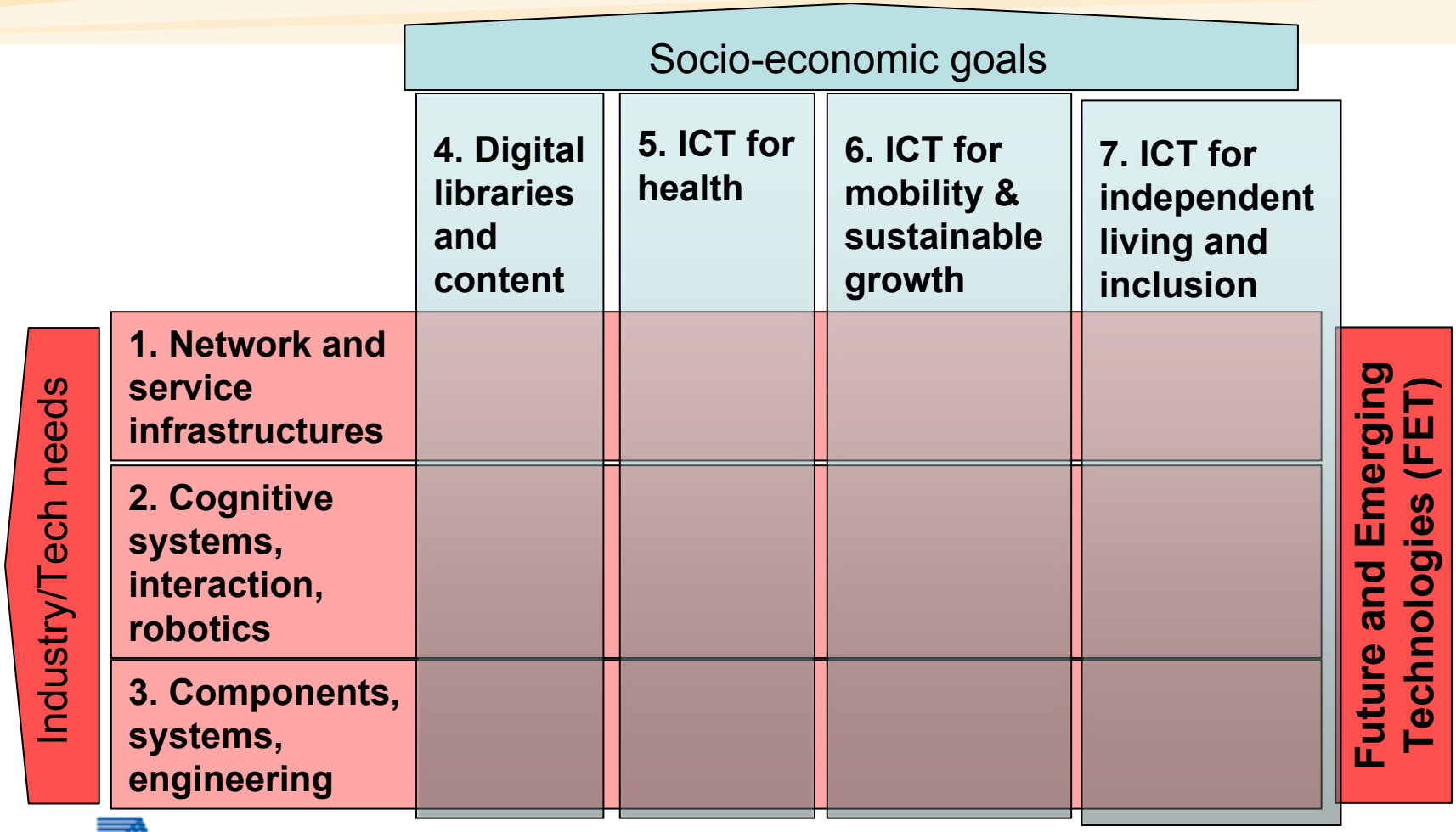
- In line with
  - EU's i2010 policy for ICT
  - the scope of FP7 Framework and Specific Programmes

- Responding to
  - orientations from Programme Advisory Panel
  - opinions from Programme Management Committee
  - Strategic Research agendas from European Technology Platforms
  - 100+ thematic consultation meetings

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
- 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* expressed within 7 *Challenges*

Work Programme 2007 *Challenges*



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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 …

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 and to the networked enterprise

Challenge 1: Objectives in ICT Call 2 + Joint ICT/Security Call

- 1.6: New Paradigms and Experimental Facilities (ICT Call 2) – 40 M€
  - Advanced networking approaches to architectures and protocols … *coupled with validation in large-scale testing environments …*
  - Interconnected test beds … *addressing networks, services, software, security …*

- 1.7: Critical Infrastructure Protection – 40 M€ (Joint Call between ICT and Security Themes)
  - Technology building blocks for creating, monitoring and managing secure, resilient and always available information infrastructures …
  - that link critical transport and energy infrastructures …

Challenge 2: Cognitive systems, interaction, robotics

- 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

- 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 2: Objective in ICT Call 3

- 2.1: Cognitive systems, interaction, robotics – 97 M€
  - Robots handing tangible objects … operating autonomously … in cooperation with people … *grasp, manipulate, navigate … detect, recognise, classify* …
  - Robots, sensor networks or other artificial systems monitoring and controlling material and informational processes … *multi-sensory data fusion and interpretation*
  - Intuitive multimodal interfaces and interpersonal communication systems … *physical and cognitive capabilities, communication needs, context* …

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 …

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
  - 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 3: Objectives in ICT Call 2

- 3.5: Photonic components and subsystems – 90 M€
  - Core: *lasers, light sources, optical fibres, image sensors)*
  - Application-specific components/subsystems: *broadband networks, medical, sensing for environment, security …*

- 3.6: Micro/nanosystems – 83 M€
  - smart systems: *sensors, actuators, storage systems, communications, data management*
  - nano/bio/ICT: *biosensors, bioMEMS, implants*
  - Integration of smart materials: textile, glass, paper
  - Microsystems manufacturing technologies

Challenge 3: Objectives in ICT Call 2

- 3.7: Networked embedded & control systems - 47 M€
  - Middleware platforms, *supporting composability, scalability, minimal power consumption …*
  - Cooperating objects and wireless sensor networks, *supporting objects cooperating under severe resource constraints …*
  - Control of large-scale distributed systems *like energy, transport, manufacturing systems: mastering bandwidth limitations, delays, fading links, unavailable nodes; closing the control loop …*

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

- 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 4: Objectives in ICT Call 3

- 4.1: Digital libraries and technology-enhanced learning – 50 M€
  - Large-scale libraries, preservation: *access, search, management …*
  - Technology-enhanced, adaptive and intuitive learning: *personalisation, communities-based, via games* …

Challenge 4: Objectives in ICT Call 3

- 4.2: Intelligent content and semantics – 50 M€
  - Authoring, workflow, personalisation: *interactive content, mixed reality / immersive consumption of adaptive content …*
  - Semantic foundations: *probabilistic modelling, approximate reasoning …*
  - Knowledge mgmt systems: *extracting meaning from info …*

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)
  - patient-specific healthcare
  - early diagnostics & predictive medicine

Challenge 5: Objective in ICT Call 2

- 5.3: Virtual physiological human – 72 M€
  - Patient-specific computational modelling and simulation: *multi-level computational models, toolbox for simulation/visualisation …*
  - Data integration and new knowledge extraction: *coupling scientific research data with clinical data, data mining, image processing …*
  - Clinical applications and demos: *surgery simulation, disease prediction, drugs safety …*

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 ICT Call 2

- 6.2: ICT for cooperative systems – 48 M€
  - Vehicle-to-vehicle, vehicle-to-infrastructure communication *for real-time traffic management and active safety support …*
  - Field operational tests: *efficiency, quality, robustness, user-friendliness …*

- 6.3: ICT for the environmental management and energy efficiency – 54 M€
  - Collaborative systems for environmental management: *monitor, assess, report, respond …*
  - ICT for energy-intensive systems: *optimise energy use profiles, monitor energy production, trading, distribution, consumption …*

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, accessability 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

- 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

Challenge 7: Objectives in ICT Call 2

- 7.2: Accessible and inclusive ICT – 43 M€
  - Embedded generalised accessibility support: *mainstream accessibility …*
  - Simulation of user interaction: *optimise accessibility*
  - Assistive systems based on non-invasive brain-to-computer-interaction: *augment performance of people with disabilities …*
  - Environments facilitating social inclusion of marginalised young people: *e.g. Web 2.0, gaming technology, media-enhanced learning …*

Future and Emerging Technologies

- Objective
  - Pathfinder role: prepare for future ICT directions in the WP
  - Avoid 'tunnel vision' in FP7, by exploring unconventional 'minority' options and opportunities off the beaten track
  - To foster trans-disciplinary research excellence in emerging ICT-related research domains

- FET Open Scheme
  - **Open Call for continuous submissions**
  - To help emerging research communities to organise and structure their research agenda

- FET Pro-active Initiatives
  - Fundamental cross-cutting long-term challenges in ICT:
    ICT Call 3:
    - Science of complex systems for socially intelligent ICT
    - Embodied Intelligence (targeting "long tail" of robotic service market)
    - ICT forever yours (targeting dependability, security and longevity of digital systems)

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

ICT Call 1 – Opened: 22 December 2006
Closed: 8 May 2007

***Challenge* 1:**	**Budget**
1. The network of the future	200 M€
2. Service & software architectures, infrastructures & engineering	120 M€
3. ICT in support of the networked enterprise	30 M€
4. Secure, dependable and trusted infrastructures	90 M€
5. Networked media	85 M€
***Challenge* 2:**	
1. Cognitive systems, interaction, robotics	96 M€
***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: 22 Dec 2006 - 8 May 2007 + FET Open – continuous, close 31 Dec 2008

***Challenge* 4:**	**Budget**
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€
***Challenge* 7:**	
1. ICT and ageing	30 M€
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	7 M€
FET-Open (separate Call for Proposals)	65 M€

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ICT Call 1

Proposals received: 1836

- Ineligible: 13 (1%)
- Below threshold: 999 (54%)
- Above threshold: 824 (45%)

Retained for negotiation: 318 (17%)

ICT Call 1

Objective	Projects
Network of the future	46
Service & SW architectures, infrastructures and engineering	27
Networked enterprise	10
Secure, dependable and trusted infrastructures	24
Networked Media	20
Cognitive systems, interaction, robotics	26
Next generation nanoelectronics components and electronics integration	20
Organic and large-area electronics, visualisation and display systems	20
Embedded systems design	15
Computing systems	9
Digital libraries and technology-enhanced learning	12
Intelligent content & semantics	15
Personal health systems for monitoring and point-of-care	9
Risk assessment and patient safety	9
Intelligent vehicles and mobility services	14
ICT & ageing	10
FET proactive 1 - Nano-scale devices	9
FET proactive 2 - Pervasive adaptation	7
FET proactive 3 - Bio-ICT convergence	7
International cooperation	9
	318

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ICT Call 2 – Open: 12 June 2007
Close: 9 Oct 2007

***Challenge* 1:**	**Budget**
6. New paradigms and experimental facilities	40 M€
Critical infrastructure protection (open: 30 Aug, close: 29 Nov 2007)	20 M€
***Challenge* 3:**	+20/security
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: 4 Dec 2007
Close: 8 April 2008

***Challenge* 2:**	**Budget**
1. Cognitive systems, interaction, robotics	97 M€
***Challenge* 4:**	
1. Digital libraries and technology-enhanced learning	50 M€
2. Intelligent content and semantics	50 M€
FET	
4. Science of complex systems for socially intelligent ICT	20 M€
5. Embodied intelligence	20 M€
6. ICT forever yours	20 M€
Horizontal support actions	
International cooperation	5 M€
Trans-national co-operation among NCPs	3 M€

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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