

PROMETEO

Plataforma Tecnológica Española de
Sistemas con Inteligencia Integrada



Asamblea PROMETEO – Valencia 3/12/08

Objetivos Programa Marco VII 2009.

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WP 2009-10: Principales aspectos

- Los proyectos que se lancen en 2009-2010 tendrán su impacto en 2015-20
- Por entonces, infraestructura global del conocimiento TIC – estructuras de mercado – cadenas de valor – modelos de negocios: todo será completamente transformado

Los “challenges” deberían:

- Alentar a las empresas a explorar opciones más innovadoras que de otro modo perseguirían
- Focalizar la colaboración en la investigación de “alto riesgo” sobre TICs a medio y largo plazo

7 Challenges

- Challenge 1: Future Internet as a federating research theme
- **Challenge 2: Cognitive Systems, Interaction, Robotics**
- **Challenge 3: Components, systems, engineering**
- Challenge 4: Digital Libraries and Content
- **Challenge 5: ICT for Health**
- **Challenge 6: ICT for mobility, environmental sustainability and energy efficiency**
- Challenge 7: ICT for Independent Living, Inclusion and Governance

Challenge 2

Cognitive Systems, Interaction, Robotics

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-robot interactions rather static / passive
 - unable to adapt to human behaviours, critical safety issues unresolved
- Machine translation
 - cross-lingual access to information: making sense of the online maze
 - enhanced productivity of human translation (by 15-30%)
- Automatic translation of "acceptable" quality in limited domains / language pairs
- Content / workflow management
 - combination of MT and Translation Memory, automating repetitive translations
 - management of multilingual web sites

5 – 15 years

- Robots, machines and systems exhibiting advanced behaviour
 - operating with gaps in knowledge in dynamic / frequently changing environments
- Machines and systems that understand their users / context
 - learning from observation/ adapting to context
- Robotic systems with rich interaction capabilities
 - all senses, gestures, natural language – for safe human-robot collaboration
- Self-learning machine translation
 - Filling in gaps in language coverage
 - No human supervision / Autonomous learning
- Progressive independence from topic and language pair
- Multilingual Web paradigm
- Automated versioning and management of multilingual web sites

Objetivo: ICT-2009.2.1

73M€

Call 4

2.1 Cognitive Systems and Robotics IP, Strep, NoE, CA

Cognitive Systems and Robotics (Call 4)

Endowing robots with advanced perception and action capabilities, benchmarks and tests (STREP)

Scientifically grounded system architectures integrating communication, control, and cognitive capabilities (IP)

Integration of diverse research areas to understand and design cognitive systems (NoE)

Coordination of robotics community (CA)

Challenge 3: Components, systems, engineering

Trends, challenges & opportunities

Trends in miniaturisation, diversification, increasing SW content and emphasis on systems approach remain valid

Challenges:

- Multi-disciplinarity
- Integrated SW/HW systems
- Heterogeneous micro-systems
- Widely distributed systems

Cross cutting issues:

- Efficient energy management
- Minimising environmental footprint of manufacturing

New opportunities - New types of devices and intelligent systems:

- Nano-scale integration, new materials
- Photonics and organic electronics
- Quantum and molecular technologies
- Embedded ICT in ever broader range of devices, objects and processes

Expected Impact

- Exploration of alternative paths and fostering of new types of collaborations
- Reinforced EU knowledge and skills
- Increased critical mass of resources and knowledge
- More international cooperation
- Higher attractiveness of EU to investments
- Closer cooperation between Member States

- Maintained leading position of EU in product innovation and design
- Wider use of smart systems in various application sectors
- Higher energy efficiency and reduction of waste in manufacturing
- Contribution to evolution of traditional industries (printing, clothing)
- Emergence and growth of new companies
- Strengthened competitiveness of EU industry through risk sharing

Objetivo: ICT-2009.3.2

Call 4

3.2 Design of SC components ... > 1 IP/Strep

25M€

Design of Semiconductor Components and Electronic Based Miniaturised Systems

Improved design platforms, interfaces, methods and tools

- energy efficient electronic systems
- thermal effect aware design
- heterogeneous functions
- enable the efficient realisation of very complex circuits, first time right

> **one IP:** design platforms and modelling

Strep: specific tools, methods or targeting specific needs

Support measures (CSA)

- dissemination, training, education and access
- networked centres of excellence and design infrastructure
- international cooperation (Russia, India)

Activity is complementary to the activities in the ENIAC JTI

Call 4

3.4 Embedded Systems Design **2 IPs/Strep**

28M€

Embedded Systems Design

Theory and novel methods for embedded system design

- heterogeneity, predictability of non-functional properties (performance, fault tolerance, life expectancy and power consumption)
- robustness validation
- adaptivity and self-awareness
- self-configuration

one IP: end-to-end design methodologies and associated tool chains
STREP: specific methods and tools

Modules and tools for embedded platform-based design

- integrated design environment for ES
- software, HW/SW and system design tools
- interoperability of tools primarily from SME vendors
- technology for efficient resource management

one IP: address design tool integration
STREP: specific issues or topics

Coordination of national, regional and EU-wide R&D strategies (CSA)

- align research agendas

Complementary to ARTEMIS JTI

Objetivo: ICT-2009.3.5

Call 5 3.5 Engineering of ... control systems 2 IPs/Strep/NoE

32M€

Engineering of Networked Monitoring and Control systems

Foundations of complex systems engineering (Strep, NoE)

- robust, predictable and self-adaptive behaviour for large-scale networked systems
- foundational multi-disciplinary research

Wireless Sensor Networks and Cooperating Objects

- support spontaneous ad-hoc cooperation between objects
- experimenting large-scale applications of wireless sensor networks

one IP: architectures and integration platforms

STREP: specific issues or topics

Control of large-scale systems

- scalable and modular architectures and platforms
- Standardisation is encouraged

one IP: architect, develop and demonstrate process automation systems

STREP: specific issues or topics

International cooperation (CSA)

Complementary to ARTEMIS JTI

Objetivo: ICT-2009.3.6

Call 4

3.6 Computing systems Strep

25M€

Computing Systems (Strep)

Parallelisation & programmability

- automatic parallelisation
- high-level parallel programming languages
- holistic approach: underlying hardware / operating system / system software
- exploiting dynamic (run-time) information
- testing, verification and debugging

Methodologies, techniques and tools

Continuous Adaptation

beyond strict separation between compiler, runtime and hardware

Virtualisation

portability, flexibility, optimised use of resources

Customisation

rapid extension and/or configuration of existing systems

System simulation and analysis

Simulation and analysis of complex multicore systems

Technology implications

System architectures, tools and compilers for next-generation semiconductor fabrication

Coordination (CSA)

Challenge 5: ICT for Health

Challenges

- Sustainable delivery of quality health care
- Affordable healthcare
- Demographic changes
- Inefficiencies
- Inadequate safety standards
- Higher citizens expectations
- Focus on treatment rather than prevention
- Lack of skilled medical specialists



Expected Impacts

- Improved productivity of healthcare systems
- Continuous and personalised care solutions
- Saving in lives and resources
- New ICT-based environments for biomedical research and predictive medicine
- Interoperability and standards
- Reinforced leadership of EU's eHealth and medical devices industries
- Reinforced international cooperation
- Increased EU research excellence

Call 4

63 M€

5.1 Personal Health Systems **Limited number of IPs + Streps**

Personal Health Systems

Minimally invasive systems and ICT-enabled artificial organs (> 2 IPs/Strep)

- remote monitoring and care
- integrate components into wearable, portable or implantable devices

Application domains: Cardiovascular diseases, Diabetes, Renal failure (artificial kidney), Liver failure (artificial liver support)

Mental Health (>1 IP/Strep)

- stress, depression or bipolar disorders
- multi-parametric monitoring systems

Support Actions (CSA)

- prevention of diseases
- interoperability of PHS

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

Challenges

- Increasing demand for energy (transport 30%)
- Traffic congestion
- Climate change
- Need for energy efficiency in the most energy-intensive sectors
- Need to reduce CO2 emissions
- Need of a safe, clean and healthy environment to sustain quality of life
- Cities have acute sustainability challenges



Expected Impacts

- Cleaner, safer and more efficient vehicles
- Vehicle-to-vehicle and vehicle-to-infrastructure co-operative technologies
- New mobility concepts
- Intelligent power grid
- Energy-positive buildings and neighbourhoods
- Distributed environment monitoring and management systems
- New environmental services
- Increased capacity to mitigate impacts of natural disasters
- Optimal management of urban complexity
- New jobs and energy efficiency services
- More competitive European products and services

3 Objetivos: ICT-2009.6.1

Call 4

6.1 ICT for safety and energy efficiency in mobility **IP / Strep**

53 M€

ICT for safety and energy efficiency in mobility

ICT for Intelligent Vehicle Systems (IP/Strep)

- in-vehicle safety systems
- autonomous driving
- crash avoidance and collision reduction
- integrated approach (infrastructure, vehicles, drivers, other users)

ICT for Clean and Efficient Mobility (IP/Strep)

- energy-efficient driving (eco-driving)
- on-board systems / co-operative infrastructure
- energy-optimised / adaptive traffic control
- international harmonisation and standardisation (Japan, USA)

Coordination and Support Actions (CSA)

- research agenda / international cooperation
- user awareness and dissemination
- support to Intelligent Car Initiative / eSafety Forum

Objetivo: ICT-2009.6.3

Call 4

6.3 ICT for energy efficiency Strep

30 M€

ICT for Energy Efficiency (Strep)

ICT tools for the future electricity market

- architectures and tools for open electricity market
- service delivery platform
- uniform energy and information interfaces
- validate in concrete applications

ICT support to energy-positive buildings and neighbourhoods

- monitoring and control systems
- information platforms connected to grids
- intuitive user interfaces
- tests under real conditions

ICT services and software tools enhanced with energy features

- support to control emissions and energy consumption
- CAD and simulation tools
- enterprise Management Systems
- patterns, profiles, methods, energy consumption models

Coordination Actions (CA)

- coordination of national/regional programmes / roadmaps / Interoperability frameworks /
- awareness raising

Objetivo: ICT-2009.6.5

Joint
Call
ICT/ENE

6.5 Novel ICT solutions for smart electricity distribution networks **Strep**

20 M€

Novel ICT Solutions for Smart Electricity Distribution Networks (Joint call – STREP [ICT])

ICT infrastructures for management of electricity distribution networks

- scalable, low-cost, secure, reliable, open, self-healing capabilities
- dynamically reconfigurable ICT architectures
- technologies and tools for ICT systems survivability
- platforms integrating real-time information from wireless sensor networks
- integration of external information systems such as weather forecasts

Trial tests to validate and assess the proposed solutions

Involvement of partners from both the ICT and Electricity communities

Próximos pasos (1/2)

- **22 January 2009: ICT Proposer's Day, Budapest**
- **1 April 09: ICT Call 4 deadline ~800 M€**
- **July 09: ICT Call 5 launch ~720 M€**
- **November 09: ICT Call 6 launch ~ 285M€**

Próximos pasos (2/2)

INFODAYS CDTI (Madrid)

14 de Enero de 2009 - Challenges 1 y 2

- 1.1 The Network of the Future
- 1.5 Networked Media & 3D Internet
- 2.1 Cognitive Systems and Robotics
- 2.2 Language-based Interaction

15 de Enero de 2009 - Challenges 5 y 6

- 5.1 Personal Health Systems
- 5.2 ICT for Patient Safety
- 6.1 ICT for Safety and Energy Efficiency in Mobility
- 6.3 ICT for Energy Efficiency
- 6.4 ICT for Environmental Services & Climate Change Adaptation

20 de Enero de 2009 - Challenge 3

- 3.2 Design of Semiconductor Components and Electronic-based Miniaturised Systems
- 3.3 Flexible, Organic and Large Area Electronics
- 3.4 Embedded Systems Design
- 3.6 Computing Systems
- 3.8 Organic Photonics and other Disruptive Photonics Technologies



Budapest
22 January 2009



Obtain information

- Challenges and objectives of the Work Programme
- Instruments, contracts, rules for participation
- Around 100 Commission officials present

Network

- Meet researchers with similar or complementary research interests
- Form project consortia

http://ec.europa.eu/information_society/events/budapest_2009

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