Lecture 2: IST Overview

Information Society Technologies - a thematic priority for Research and Development under the Specific Programme "Integrating and strengthening the European Research Area" in the Community Sixth Framework Programme

European research activities are structured around consecutive five-year programmes, or so-called Framework Programmes. The Sixth Framework Programme (FP6) sets out the priorities - including the Information Society Technologies (IST) Priority - for the EU's research, technological development and demonstration (RTD) activities for the period 2002-2006.

http://europa.eu.int/comm/research/fp6/index_en.html

These priorities have been identified on the basis of a set of common criteria reflecting the major concerns of increasing industrial competitiveness and the quality of life for European citizens in a global information society. This is elaborated upon in the Information Society Directorate-General's (DG) mission statement.

Mission statement:

The Information Society Directorate-General ("DG") of the European Commission is charged with ensuring that Europe's citizens, governments and businesses continue to play a leading role in shaping and participating in the global information society.

The Directorate-General is driven by the European Commission's eEurope action plan and has specific responsibility for increasing the understanding, development and uptake of information and communication technologies and their applications within the European Union.

It does this by stimulating research into the development and deployment of new information and communication technologies; establishing and maintaining a framework of regulation and standards designed to generate competition; and stimulating the development of applications and content while supporting initiatives that encourage and enable all European citizens to benefit from, and participate in, the information society.

IST vision

The IST thematic priority will contribute directly to realising European policies for the knowledge society as agreed at the Lisbon Council of 2000, the Stockholm Council of 2001, the Seville Council of 2002, and as reflected in the e-Europe Action Plan.

The strategy adopted in Lisbon 2000 is for an accelerated transition to a competitive and dynamic knowledge economy capable of sustainable growth, with more and better jobs and greater social cohesion. This requires wider adoption, broader availability and an extension of IST applications and services in all economic and public sectors and in the society as a whole. IST are the key underlying technologies for easier and efficient knowledge creation, sharing and exploitation.

The objectives of IST in FP6 are therefore to ensure European leadership in the generic and applied technologies at the heart of the knowledge economy. It aims to increase innovation and competitiveness in European businesses and industry and to contribute to greater benefits for all European citizens.

The focus of IST in FP6 is on the future generation of technologies in which computers and networks will be integrated into the everyday environment, rendering accessible a multitude of services and applications through easy-to-use human interfaces. This vision of "ambient intelligence"[1] *places the user, the individual, at the centre of future developments for an inclusive knowledge based society for all.*

This research effort will therefore ***reinforce and complement the eEurope 2005***[2] ***objectives*** *and look beyond them to the 2010 goals of the Union of bringing IST applications and services to everyone, every home, every school and to all businesses.*

*e*Europe2005 aims at a wider deployment of IST including to modernise further the public services including egovernment, ehealth and elearning and to create a dynamic business environment. It also aims at ensuring higher security of the information infrastructure and a wider availability of broadband access.

*e*Europe will therefore contribute to the adoption of the research results as they emerge. It will also provide feedback about their acceptance and the problems related to their use. This close articulation between the research and policy initiatives is a key component of the Union strategy to achieve the Lisbon goals.

The Community support for IST in FP6 will help mobilise the industrial and research community around high-risk long term goals. It should facilitate the aggregation of public and private research effort on a European scale and enable the development of a European Research Area (ERA) in IST.

IST in FP6: coverage and main targets

Realising the vision requires a massive and integrated research effort that addresses the major societal and economic challenges and ensures the co-evolution of technologies and their applications.

The FP6 instruments, such as Integrated Projects, will enable the integration of various research activities from knowledge generation and technology development to their application and transfer. They provide an opportunity to combine, as appropriate, applied and generic technology research. This will help pull the technology developments with applications and services addressing the socio-economic challenges and will help focus the applied research on the development of relevant innovative technology platforms.

The main societal and economic challenges to be addressed are:

- Solving "**trust and confidence**" problems so as to improve dependability of technologies, infrastructures and applications. These should ensure security, privacy and protect property and individual rights. Improving trust in the knowledge society is a key requirement for its development.
- Strengthening **social cohesion by providing** efficient, intelligent and easy to use systems for health, transport, inclusion, risk management, environment, learning and cultural heritage.

[1] ISTAG report: Ambient Intelligence scenarios for 2010, http://www.cordis.lu/ist/istag.htm
[2] including *e*Europe+, http://europa.eu.int/information_society/eeurope/index_en.htm

- Enabling **sustainable growth and improving competitiveness** both of large and small businesses as well as the efficiency and transparency of governments. This includes the development of mobile eCommerce and business and ework processes and will provide for more and better jobs.
- Supporting complex problem solving in science, society, industry and businesses. The aim is to harness the computing and knowledge management resources across Europe and bring them to the desktop of any researcher, engineer or other end user.

This requires progress in three main technology building blocks:

- Pushing the limits of miniaturisation and minimising the costs and power consumption of **microelectronic components and micro-systems**. This includes breaking new barriers with current CMOS technology below the 10 nano-meter. It also includes the exploration of alternative materials allowing further miniaturisation or organic flexible materials for displays, sensors and actuators so that they can be placed anywhere, even in the human body, and take any shape.
- Developing mobile, wireless, optical and broadband **communication infrastructures as well as software and computing technologies** that are reliable, pervasive, interoperable and can be adapted to accommodate new applications and services. Europe's strengths both in communication technologies and in embedded software and systems provide a clear opportunity to lead and contribute to the development of the next generation of products and services. The development of open standards and open source software will be encouraged when appropriate to ensure interoperability of solutions and to further innovation.
- Developing **user friendly interfaces** which are intuitive, can interpret all our senses such as speech, vision and touch and that understand our gestures and various languages. This should be coupled with more powerful and flexible **knowledge technologies** that are semantic-based and context-aware. They should prepare for the next generation Web and make access to, and creation of digital content more effective and more creative.

IST today	The IST in FP6 vision
PC based	"Our surrounding" is the interface
"Writing and reading"	Use all senses, intuitive
"Word" based information search	Context-based knowledge handling
Low bandwidth, separate networks	Infinite bandwidth, convergence,..
Mobile telephony (voice)	Mobile/Wireless full multimedia
Micro scale	Nano-scale
Silicon based	+ new materials
e-Services just emerging	Wide adoption (*e*Health, Learning,...)
< 10% of world population on-line	World-wide adoption

IST Strategic Objectives

Focus on a limited set of Strategic Objectives

In order to ensure concentration of effort and critical mass, the Workprogramme for 2003-2004 is **focussed on a limited set of Strategic Objectives** that are essential to realise the IST in FP6 goals. They have been defined to mobilise researchers Europe-wide and bring together the effort necessary to address the relevant challenges.

The Strategic Objectives have been selected following an intensive consultation process that included SWOT[3] analyses exploring Europe's options at the economic, social and technology levels. They cover technology components, integrated systems and pull-through applications that have been carefully identified so as:

- **to reinforce European strengths in areas where it has established industrial and technology leadership:** This is the case for example in mobile and wireless communications, in microelectronics and microsystems, in embedded systems, in applied IST for health, transport and business support tools.
- **to overcome weaknesses in areas which are critical for European competitiveness and for addressing societal challenges:** This is the case for the area of generic software and computing systems and in content development tools. The development of ambient intelligence provides an opportunity for Europe to reposition itself for the next generation of generic products and services building on a large user industry and service providers.
- **to exploit new opportunities and respond to emerging needs:** Examples include advanced interaction techniques, new sensors and Microsystems, context-aware knowledge handling and Grid based systems to solve complex problems in environment, health or engineering.
- **to ensure the co-evolution of technology and applications** so that technology advances are exploitable in innovative products and services. Particular attention will be paid to users' needs and to usability and accessibility of technologies and applications. The IST priority seeks to promote integrated approaches to address the vision. This is reflected in the definition and selection of the set of objectives as explained in the following paragraph.

In addition, IST in FP6 will support research to investigate and experiment with future visions and emerging technologies (FET) at the frontier of knowledge in the IST field. This will help new IST-related science and technology fields and communities to emerge, some of which will become strategic for economic and social development in the future and will feed into the mainstream IST activities in the future.

Focus on the fields that need to be addressed at European level

Experience has shown that the development of common visions and consensus building is a key element of European successes in IST. This will require different types of sustained efforts and timescales according to the field. Links and articulation of Community contribution with member and associated states activities and EUREKA, including in particular the funding of complementary research, will therefore be sought in all activities.

[3] Europe's SWOT analysis in IST are part of the reports of ISTAG, Expressions of Interest and other workshops. They are all present on http://www.cordis.lu/ist/istag.htm.

For each of the objectives, the Community support will **focus only on the work that is essential to be done at European level and that requires a collaborative effort** involving the research actors across the Union and associated states. The Community effort will therefore be considered systematically as part of a wider European approach to address these objectives.

An integrated approach associating generic and applied technology development

The objectives address technology components, the integration into systems and platforms, as well as the development of innovative applications and services. They are therefore interlinked and should not be seen as separate isolated activities. A proposal addressing a specific objective would cover all the research that is necessary to achieve its goals. **This could span across the value chain from technology components to applications and services.**

A key component of this integrated approach is the need to bring together different types of constituencies from the IST user and supply industry, from academic research labs and from large and small companies. IST in FP6 will therefore help establish solid frameworks for collaboration both within and across industrial and technology sectors.

Reinforcing Europe's position in IST on the International level

In most IST fields, collaboration between European and non-EU research teams is essential to ensure exploitation of research results at a global scale and to build interoperable technology solutions. This is of unique value for the competitiveness of European industry and is a means to reach consensus on global critical issues such as security and dependability or the digital divide.

FP6 foresees international cooperation in all projects whenever needed including the support to non-EU partners from the framework budget provided that they belong to the categories defined in the Specific Programme[4]. International cooperation will be therefore sought as appropriate in the different objectives and will be also supported in the general accompanying actions.

The level of participation of organisations established in the associated candidate countries will be carefully monitored. Whilst they are equal partners at the same level as the EU member states, their participation in IST will be expressly encouraged, in particular with a view to facilitate their integration in *e*Europe2005 and *e*Europe+, and including through special measures if deemed necessary.

[4] A budget of about 90 MEuro has been earmarked for participants from the following countries: Russia and Newly Independent States, Mediterranean Countries including the western Balkans and developing countries. Participants from other third-countries may also get funding in duly justified cases.

Budget and planning for the four years

The estimated distribution of the budget commitments over the four years, as well as the deadlines for the calls, are given in the table overleaf. The present Workprogramme describes the content of the calls drawing on 2003 and 2004 budgets, which will be around 1.725 Billion Euro.

Year	2003	2004	2005	2006
Indicative Commitment Budget	835,000	891,000	935,000	964,000
Calls per year	2 calls, covering 2003 and 2004 budgets	1 call, drawing mainly on 2005 budget	To be defined	To be defined

Two calls for proposals are foreseen to cover the 2003-2004 budget. Each of the calls will target a subset of the Strategic Objectives. In addition, one call with a fixed deadline is foreseen for mid 2004 and will draw on the 2005 budget. The details of this call will be provided in the yearly update of the WP.

The detailed content of the calls for 2005 and 2006 will be defined in a way that also ensures concentration and focus. It should enable the coverage of the Specific Programme whilst taking into account the evolution of needs, markets and technologies.

Instruments

The new instruments, Integrated Projects (IPs) and Networks of Excellence (NoEs), will be used as a priority means to realise the FP6 objectives when deemed appropriate. The IST thematic priority will also use the other instruments including Specific Targeted Research Projects (STREPs), Coordination Actions (CAs) and Specific Support Actions (SSAs).

The use of the new instruments will help integrate and structure research activities, bringing together European and national actions in the context of creating the European Research Area. It will also help ensure, in IST, the co-evolution of technologies and their integration in application contexts. Flexibility and adaptability is also an important feature of the instruments.

It is expected that for each Strategic Objective, a limited number of IPs and NoEs are supported (on average 2-3). Several STREPs and other actions are also foreseen in most objectives.

The budget of an IP can vary from several MEuro to several tens of millions. The budget of a NoE can go up to several MEuro per year.

IST implementation plan

Calls in 2003 and 2004

Two calls for proposals with fixed deadlines are foreseen for 2003 and 2004. These are open for all instruments, but about **2/3 of the budget is expected to be devoted to the new instruments, Integrated Projects and Networks of Excellence**.

In addition, one Call for continuous submission is foreseen for the FET open scheme.

The **indicative timetable** of the fixed deadline calls for proposals based on the WP2003-2004 is as follows:

***Fixed deadline*:**

- **Call 1** - publication 17/12 2002, closing 24/4 2003 – would have an indicative budget of around 1070 MEuro. The call follows a one stage procedure.
- **Call 2** - publication 17/6 2003, closing 15/10 2003 – would have an indicative budget of around 525 MEuro. The call follows a one stage procedure.
- **A joint call** on **manufacturing, products and services engineering in 2010** is foreseen with thematic Priority 3. The call will follow a two stage procedure. The publication will be on 17/12 2002, the deadline for the first stage (short proposals) is 24/4/2003 and the deadline for the second stage (full proposals) is 16/9 2002. The call would have an indicative budget of 25 MEuro.
- **A third call** is also foreseen for 2004 with a more limited budget than the two first calls. The details of this call will be part of the first update of the Workprogramme.

The first two calls will draw on the 2003 and 2004 budgets. The third call will draw on the 2005 budget except for FET proactive initiatives that will draw both on 2004 and 2005 budgets[5].

***Continuous submission*:**

- Only for the FET open scheme: Call published on December 17, 2003 and ending in December 2004 with an indicative budget of 60 MEuro. The call follows a two stage procedure.

Budget allocation per Strategic Objective

For each fixed deadline call, 80% of the budget is pre-distributed on the Strategic Objectives to **provide an indication** of the effort that will be devoted to each of these objectives. The remaining 20% are not pre-allocated to a specific objective. They will be allocated after the call based on the quality of proposals and the relevance of the suggested work. This will enable, in particular, to support also proposals that cut across the objectives addressed in the call.

Only proposals addressing the Objectives open in a specific call will be supported with the exception of General Accompanying actions that cut across the Strategic Objectives of the IST Workprogramme.

The table below presents the calls, the Strategic Objectives that are open in each call, the type of instruments that can be used and the pre-allocated budget per objective.

[5] 35 MEuro of the 2004 budget are pre-allocated for FET proactive in Call 3

Strategic Objectives, FET and RN	Call 1 ~1070 MEuro	Call 2 ~525 MEuro	Call 3 ~60 MEuro	Indicative pre-allocated budget[6]
Pushing the limits of CMOS, preparing for post-CMOS	All instruments[7]			75
Micro and nano systems	All instruments			85
Broadband for all	All instruments			60
Mobile and wireless systems beyond 3G	All instruments			90
Towards a global dependability and security framework	All instruments			55
Multimodal Interfaces	All instruments			65
Semantic-based knowledge systems	All instruments			55
Networked audio-visual systems and home platforms	All instruments			60
Networked businesses and governments	All instruments			75
E Safety of road and air transport	All instruments			65
eHealth	All instruments			70
Technology-enhanced learning and access to cultural heritage	All instruments			65
Advanced displays		All instruments		25
Optical, opto-electronic, photonic functional components		All instruments		45
Embedded systems		All instruments		50
Open development platforms for software and services		All instruments		55
Cognitive systems		All instruments		25
Applications and Services for the Mobile User and worker		All instruments		60
Cross-media content for leisure and entertainment		All instruments		55
GRID-based Systems for solving complex problems		All instruments		45
Improving Risk management		All instruments		30
eInclusion		All instruments		30
FET proactive	IPs, NoEs			40
FET open			STREPs, CAs, SSAs	60[8]
Research Networking test-beds		All instruments		25
General accompanying actions	SSAs+CAs	SSAs+CAs		16

Joint call with priority 3

Objectives	Instruments	Indicative budget
Products and Services engineering 2010[9]	IPs, NoEs, CAs, SSAs	25 MEuro

Support to conferences, seminars, workshops or exhibitions are part of a continuous call for grants. Application forms for these grants will be found on the IST Web site. In addition to calls for proposals, calls for tenders are also expected to be published in Years 2003-2004 on specific activities that the IST priority will support, including the organisation of the IST conference. Details will be provided in the texts of these calls for tenders.

[6] The amounts correspond to the 80% of the budget which is pre-allocated

[7] All instruments are IPs, NoEs, STREPs, CAs and SSAs

[8] This corresponds to 100% of the indicative budget of FET Open for 2003-2004

[9] The Priority 3 area that will complement this objective in the joint call is 3.4.3.1 where focus will be given to the **creation of "knowledge communities" in production technologies**

IST 2003-2004 Workprogramme

This Workprogramme covers the activities of the IST thematic priority in the Specific Programme "Integrating and Strengthening the European Research Area" for two years, 2003 and 2004. It defines the priorities for the calls for proposals in these two years, the implementation plan and the criteria that will be used for evaluating proposals responding to these calls.

http://www.cordis.lu/ist/workprogramme/fp6_workprogramme.htm

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