AN OVERVIEW OF EUROPEAN ICT R&D: CHALLENGES AND POLICIES

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Structure

• Introduction
• Innovation and R&D. Current situation in Europe
• What is Europe doing?
  ▶ i2010 Agenda
  ▶ ICT in EU’s “Framework Programmes”
• Conclusions
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Introduction

Information and Communication Technologies (ICT) are vital to creating growth throughout Europe’s economy and achieving its social and environmental goals.

ICT are:
- Basic component of the productivity growth
- Constitutive factor for the needed transformations
- Integration glue of new economical opportunities

“It is therefore crucial that Europe masters these technologies, rather than simply importing them”
Challenges ahead

• What social and economic challenges must ICT address?
• What new opportunities are arising from the ICT development and use?
• What research areas are to be addressed in Europe?
• How can the multidisciplinary approach be effective in supporting the new ICT-based opportunities?
• How capitalising on the Academic strengths to build technological excellence in the emerging ICT fields?
• What is the right approach towards the standardisation process?
• How can the public administration be part of the innovation projects?
• What is the role of the Community Programmes in ICT?

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**EU25-US innovation gap explained**

Source: European Innovation Scoreboard 2005

**EU25-Japan innovation gap explained**

Source: European Innovation Scoreboard 2005
R&D expenditure in the EU, Japan and the US

In million constant 1995 PPS
Source: Eurostat

R&D expenditure as a percentage of GDP

Year 2003. Source: Eurostat
R&D expenditure by institutional sector of performance

Year 2002. Source: Eurostat

Investment in ICT Research

<table>
<thead>
<tr>
<th>ICT R&amp;D2</th>
<th>EU15</th>
<th>US</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private sector investments</td>
<td>23 E€</td>
<td>43 E€</td>
<td>40 E€</td>
</tr>
<tr>
<td>Public sector investments</td>
<td>8 E€</td>
<td>20 E€</td>
<td>11 E€</td>
</tr>
<tr>
<td>Inhabitants</td>
<td>363 m</td>
<td>295 m</td>
<td>127 m</td>
</tr>
<tr>
<td>Investments / inhabitant</td>
<td>80 E€</td>
<td>350 E€</td>
<td>400 E€</td>
</tr>
<tr>
<td>ICT R&amp;D as % Total R&amp;D</td>
<td>18%</td>
<td>34%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Year 2002. Source: European Commission, i2010
Further problems

- With 25 countries carrying out their own research programmes, there is a lot of duplication
- At the same time, no single EU country or organisation can now afford to try and build all the know-how and skills to master these increasingly complex technologies
- The lack of a single European stock exchange for technology companies makes exits less rewarding for European companies and their backers
  ⇒ And therefore creates an under funding of European start-ups

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Europe’s answer

The European Commission is addressing the challenge on two fronts:

► Supporting the i2010 agenda for raising investment in research and innovation, notably by helping to forge common approaches and new means of supporting ICT research and innovation in Europe, involving European, national, regional and private research activities.

► Carrying out its own research programmes to pool Europe’s research resources: in 2007, the EU launches its Seventh Framework Programme for R&D (FP7).

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i2010 Agenda (I)

• The "i2010 – A European Information Society for growth and employment" initiative was launched by the Commission on 1 June 2005

• It is a framework for addressing the main challenges and developments in the information society and media sectors up to 2010

• Three pillars of i2010 Initiative:
  ► Single European Information Space
  ► Investment and Innovation in Research
  ► Inclusion, better public services and quality of life

i2010 Agenda (II)

The approach proposed in the second pillar of i2010 is based on four interlinked tracks:

► Sufficient public investment for research and development in ICT
► Better coordination of the research effort between the Member States, the Commission, Industry and the academic ICT research Community
► Creating better conditions for attracting private investment in ICT research
► Uptake of ICT in innovative products and services and its wider use by citizens and businesses
1. Better coordination of the research

The Commission has launched the “Vienna Process”, named after the “Investing in ICT Research and Innovation” Conference in Vienna in March 2006

The aim is to improve the coordination of:

- Policies and visions for ICT research across Europe
  helping identify where Europe should focus and coordinate its research efforts

- National and European ICT research programmes
  working on the ‘nuts and bolts’ of coordinating dozens of national research programmes across Europe

1. Better coordination of the research: Groups

The Commission has created two main groups to identify these visions:

- The National IST Directors Forum is an informal forum of national and European decision-makers
  It meets to discuss and develop shared visions and strategies for ICT R&D in Europe, to share knowledge and best practice and to improve coordination in ICT R&D in Europe

- The IST Advisory Group (ISTAG), which advises the Commission on its own Framework Programmes, also contributes vision papers
1. Better coordination of the research: Other initiatives

- IST ERA-NET report and projects: coordination of national and European R&D Policies and Programmes in ICT
- CISTRANA, which provides access to information on national ICT R&D policies and programmes across Europe
- FISTERA, which focuses on comparing national ICT R&D foresight exercises and exchanging visions for the future
- COST, which supports co-operation among scientists and researchers across Europe through the coordination of nationally funded research on a European level
- EUREKA, which supports pan-European projects and networks on market-oriented, industrial R&D

1. Better coordination of the research: ETPs (I)

European Technology Platforms (ETPs) help industrial and academic research communities to co-ordinate their research and tailor it to a common “strategic research agenda” (SRA)

- SRAs aim to mobilise a critical mass of national and European public and private resources and typically
- SRAs seek to overcome barriers to the development, deployment and use of new technologies

Examples of such barriers might include: how research is organised, outdated regulations, lack of common technical standards or a need for new ones, shortfall in funding, or a shortage of skills and training
1. Better coordination of the research: ETPs (II)

The ETPs created to date in ICT are:

- Artemis (Embedded Systems)
- eMobility (Communication Technologies)
- ENIAC (Nanoelectronics and Photonics)
- EUROP (Future and Emerging Technologies)
- ISI (Communication Technologies)
- NESSI (Grid Technologies and Software Technologies)
- NEM (Networked Audiovisual Systems)
- Photonics21 (Nanoelectronics and Photonics)
- EPoSS (Micro- and Nanosystems)

1. Better coordination of the research: ETPs (III)

*Networked and electronic media platform* (NEM)

- **Aims** → Accelerate the pace of innovation and convergence of the audiovisual, content and telecoms sectors

- **Launched** → July 2005

- **Expected benefits**
  - **Firms**: increased competitiveness, more coherent regulation and standardisation policies worldwide
  - **Citizens**: personalised services combining various media, to improve quality, enjoyment and value

- **Founding Members** → Alcatel, the European Broadcasting Union (EBU), France Telecom, Intel, Nokia, Philips, Telefónica and Thomson
1. Better coordination of the research: ETPs (IV)

Mobile and wireless communications technology (eMobility)

- **Aims** → Reinforce Europe’s world leadership in mobile and wireless communications and services
- **Launched** → March 2005
- **Expected benefits**
  - **Firms**: sustain world lead in mobile communication technologies
  - **Citizens**: secure, easy-to-use, “always with you” services, e.g. mobile access to the web
- **Founding Members** → Alcatel, Deutsche Telekom, Ericsson, France Telecom, Hutchison 3G Europe, Lucent Technologies, Motorola, Nokia, Philips, Siemens, STMicroelectronics, Telecom Italia Mobile, Telefónica Móviles España, Thales Communications, and Vodafone

1. Better coordination of the research: ETPs (V)

Integral Satcom Initiative (ISI) (I)

- **Aims** → Prepare for convergence and integration of broadcasting, broadband, and mobile satellite communications into the global telecommunication network infrastructure
- **Launched** → February 2006
- **Expected benefits**
  - **Firms**: maximize opportunities for business consolidation and growth
  - **Citizens**: benefits in the areas of Europe-wide and international broadcasting, mobile communications, broadband access, bridging the digital divide, safety, crisis management, and disaster relief
1. Better coordination of the research: ETPs (VI)

**Integral Satcom Initiative (ISI)** (II)


2. Attracting private investment (I)

- Higher public support to ICT research is already an important means to attract private investment
- Industry will invest in regions that have excellent public research poles…
- …This will be not enough though
  - Horizontal measures such as **tax incentives**, access to **financial markets** and **simplification of administrative procedures** are extremely important for fostering ICT research
2. Attracting private investment (II)

- Public procurement of products and services represents more than 16% of GDP in the EU15
- In ICT, public expenditure is significant in both relative (about 20% of the ICT market) and absolute terms (total EU government ICT spending around 87 billion in 2005)
- Nevertheless, currently only 5% of all eGovernment expenditure is actually spent on technology innovative projects
- **Pre-Commercial Procurement** is a process that enables public procurers to acquire technologically innovative solutions for their specific needs which are not commercially available yet

3. Uptake of ICT in innovative products and services (I)

- This is about making sure that inventions lead to innovations that are useful for the society and economy
- Most of the work in this field is to be done by the Member States in their general support to innovation and by businesses
- At Community level **the ICT Policy Support Programme** will build on, and will strengthen national efforts for the wider uptake and best use of ICT by citizens, governments and businesses and in particular SMEs
3. Uptake of ICT in innovative products and services (II)

- The ICT Policy Support programme will support **Pilot Actions as well as actions for the exchange of good practices** and for ensuring, where appropriate, EU wide access to ICT-based services

- It will bring together and rationalise the activities that are currently supported under three Community programmes:
  - eTEN
  - MODINIS
  - and after 2008 eContent+

3. Uptake of ICT in innovative products and services (III)

Actions under the ICT-policy support programme will:

- underpin regulatory and research actions to stimulate emerging digital economy based on the convergence between network services, media content and new electronic devices
- provide a bridge between research investment and wide adoption, by providing a testing ground for pan-European electronic services in both the public and private sectors
- reinforce European cultural and linguistic identities by support for the production and distribution of European digital content
- assist the development of an open and inclusive European Information Society through stimulating innovative approaches to inclusion, quality of life and public services
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The Framework Programmes

• The EU has been funding research into ICTs since 1986

• However, the EU’s own Framework Research Programmes can only ever be a small fraction of all research funding – public and private – across the EU

  Almost 90% of all public ICT research funding in Europe is spent by national and regional research programmes

• The Sixth Framework Programme (FP6) sets out the priorities – including the Information Society Technologies (IST) priority – for the period 2002-2006
### The Current (6th) Framework Programme (I)

These are the research activities that are eligible for funding under the IST priority:

1. **Applied IST research addressing major societal and economic challenges**
   - Towards a global dependability and security framework
   - ICT research for innovative Government
   - ICT for Networked Businesses
   - eSafety – Co-operative Systems for Road Transport
   - Integrated biomedical information for better health
   - Technology-enhanced Learning

### The Current (6th) Framework Programme (II)

1. **Applied IST research addressing major societal and economic challenges (cont.)**
   - Access to and preservation of cultural and scientific resources
   - Advanced Grid Technologies, Systems and Services
   - ICT for Environmental Risk Management
   - eInclusion
   - Strengthening the Integration of the ICT research effort in an Enlarged Europe
   - Collaborative Working Environments
   - Ambient Assisted Living (AAL) for the Ageing Society
The Current (6th) Framework Programme (III)

2. Communication, computing and software technologies
   - Broadband for All
   - Mobile and Wireless Systems and Platforms Beyond 3G
   - Networked Audio Visual Systems and Home Platforms
   - Software and Services
   - Embedded Systems
   - Research networking testbeds

3. Components and microsystems

4. Knowledge and interface technologies

The 7th Framework Programme

- On 6 April 2005, the European Commission submitted its FP7 proposal to the Council and the Parliament
- The codecision procedure will be followed, which means that both the Parliament and Council must agree
- The aim is to reach political agreement by the end of 2006, allowing FP7 to be launched at the beginning of 2007
- It will fund research from 2007-2013
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Conclusions (I)

- Europe accounts for around one third of global ICT sales, which are growing at 5% per year, with double digit growth in emerging markets such as India and China

- Europe is a global leader in electronic communications, accounting for 40 to 50% of the revenues of the world’s largest players

Investment in research and innovation is crucial for the ICT sector to continue delivering jobs and growth in the short and long term

- However, the EU spends less than its competitors on ICT R&D
Conclusions (II)

Proactive policies are needed to respond to the fundamental changes in technology

- The Commission intends to encourage investment in ICT research and innovation in Europe through measures integrated into the i2010 initiative
- In its proposal for FP7, the Commission asks for a substantial increase in the ICT research budget

Will this be the way to success?

The state of American telecom R&D

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