The European Initiative on Dependability: towards a dependable Information Society

Andrea Servida

European Commission
DG Information Society - C/4
Rue de la Loi, 200
B-1049 BRUSSELS

Tel.: +32 2 2958186- Fax: +32 2 2968364
andrea.servida@cec.eu.int
OUTLINE

• The IST Programme
• The European Dependability Initiative - DEPPY
• DEPPY numbers
• ERA & FP6
• Global Collaboration
The IST programme

Key Actions

Future and Emerging Technologies

Research Networking
• Focussing on dependability we pursued the convergence of different technical communities:
  • correctness & safety
  • fault tolerance
  • reliability
  • information and network security
  • survivability
  • ..
• The dependability focus was instrumental to trigger a more far reaching policy reflection on how we depend on technology ...
Depending on technology

Factors influencing issue | issue today | recommendations | Objectives for future
---|---|---|---
No attention to compatibility between technology and human systems | | • Foster an international dialogue on and planning of “clean” IS | • Develop a “clean” IS
There is no global thinking in terms of “clean” society | | • Promote the understanding of interdependencies | • Re-think how we should depend on technology
Unforeseeable R&D development | | • Support the development of an ethical approach to IS | • Promote innovative R&D as well as a global ethic to build IS
No coordinated effort to address dependability of IS infrastructures | | |

Depending on Technology
• Pervasiveness,
• Interdependency,
• Intrusiveness

The European Initiative on Dependability: towards dependable Information Infrastructures
Drivers for DEPPY - Business

- **Deregulation in telecomm** leads to new players, services and applications - *blurring sector and jurisdictional boundaries*;

- **The convergence** of communication infrastructures boosts the deployment of *unbounded network computing environments*;

- **Information is an asset** - from manufacturing-centered to an *information management model*;

- **Globalization** of services, companies and integration of business processes;

- **New threats** and vulnerabilities.
Drivers for DEPPY - Technological

- From **monolithic proprietary systems** to open **systems-of-systems** with greater **interconnectivity** and **complexity**;
- The pressure to produce **cost effective systems** places increasing reliance on COTS, reuse and the evolution of legacy systems;
- Convergence is increasing the **sophistication** (e.g. multiple technologies) and the **complexity** of systems;
- Rapid **evolution of standards**;
- Urgent **need to establish an interoperable infrastructure of trustworthy services**.
• The traditional **chain of trust is affected** by the blurring of geographical borders and boundaries;

• The **perception of benefits and risks** related to IT application and Internet is diverse;

• Mass **market volume for embedded systems** presupposes that
  * **users are not experts**;
  * **operating and environmental conditions vary hugely**.
Five goals:

• *Foster a dependability-aware culture*, leveraging on
  * education in dependability that embraces multi-disciplinary approaches;
  * raising dependability *awareness* in society;
  * joining the somewhat separate *technical communities* dealing with safety, security, reliability and survivability, and promoting combined approaches to dependability;
  * promotion of and training in *best practice*. 
• **To provide a workable characterization of affordable dependability**, focussing on:
  * Dependability frameworks;
  * Dependability characterization, especially to support certification;
  * Characterization of quality of information.
• To facilitate global interoperable trust frameworks, focussing on:
  * supporting mediation and negotiation along the chains of trust;
  * providing clear guidance on liability issues;
  * securing information sharing;
  * pursuing the harmonization of certification practice and standards for networked services.
The European Dependability Initiative -
The goals

• **To provide the capability to master heterogeneous environments**, addressing:
  * the use and integration of **COTS/Legacy** systems by appropriate and scalable means;
  * the establishment of **global mechanisms** available for rapid **recovery strategies**;
  * architectural models for systems **composability** and to support predictable design;
  * **technical heterogeneity** of systems and development processes as well as the **evolutionary aspects** of systems and the need to support them.
• *To provide capability to manage dependability in largely distributed environments*, developing
  * practice to construct *adequately dependable systems* from components with varying level of dependability;
  * united frameworks for modeling and validation;
  * cost-effective, application specific, fault-tolerant strategies for *varying level of dependability*;
  * business driven models to manage dependability in a risk management perspective relevant for the business environment.
DEPPY: its numbers

- **4 preparatory Workshops** were held from 1997 to 1999 to define the initiative. More than **50 EU org.** plus some **USA 15 org.** were involved.
- **16 projects** are part of DEPPY portfolio for an overall value ~**54 million Euro** of which **28.4 million Euro** is the funding from the Commission;
- ~**100 contractors** in projects + some **40 members** more in **1 NoE**;
- ~**20 PO (including 6 from the JRC)** have been involved in building, defining and implementing **DEPPY**;
DEPPY: its numbers

• 1 DEPPY Project Workshop - at ICDSN 2001 in Göteborg;

• 1 Web site - deppy.jrc.it;

• 1 study on Complexity and dependability - in collaboration with Washington University;

• 2 Workshops on Interdependencies and vulnerabilities in Information Infrastructures - March 2001 & November 2001;

• 1 EU WG on Interdependencies and vulnerabilities in Information Infrastructure - since June 2001;
DEPPY: its numbers

• 1 Joint EU-US Task force on CIP set up in 1998 under the auspices of the JCG of the S&T Agreement with USA;

• 4 EU-US Working Workshops from 1999 to 2001 - the last one was held on 1-2 December 2001 in Düsseldorf;

• 2 Project Workshops with DARPA in 2000 and 2001;

The Lisbon Strategy...

to become the strongest knowledge-based economy in the world by 2010

...based on 3 ingredients:

• A single market ...  
• A single currency ...  
• European Research Area: a single European market for research ...

• ERA  
• FP6  
• IST in FP6
• Knowledge-based economy & society

• competitiveness & economic growth

• legal instruments (e.g. European Patents)

• financial instruments: FP6
# Commission proposal for FP6

## Integrating European Research

<table>
<thead>
<tr>
<th>Priority</th>
<th>Thematic Areas</th>
<th>Anticipating S/T Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genomic and biotechnology for health</td>
<td>Information society technologies</td>
<td>Research for policy support</td>
</tr>
<tr>
<td>Nanotechnologies, intelligent materials, new production processes</td>
<td>Aeronautics and space</td>
<td>Frontier research, unexpected developments</td>
</tr>
<tr>
<td>Food safety and health risks</td>
<td>Sustainable development and global change</td>
<td>Specific SME activities</td>
</tr>
<tr>
<td>Nanotechnologies, intelligent materials, new production processes</td>
<td>Citizens and governance in the knowledge society</td>
<td>Specific international cooperation activities</td>
</tr>
<tr>
<td>Aeronautics and space</td>
<td></td>
<td>JRC activities</td>
</tr>
</tbody>
</table>

## Restructuring the ERA

| Research and innovation | Human resources & mobility | Research infrastructures | Science and society |

## Strengthening the Foundations of ERA

| Coordination of research activities | Development of research/innovation policies |
• from co-operation

• to reinforcing scientific / technical excellence

• Concentration on 7 priorities, one of them is IST

• implemented through 3 major instruments:
  – Networks of Excellence
  – Integrated Projects
  – participation of the EU in national pgms (Art. 169)
Instruments of FP6

The European Initiative on Dependability: towards dependable Information Infrastructures
• Would **reinforce scientific and technological excellence** by integrating research capacities
• Would be contribute to the **solution of important societal European** through mobilisation of a **critical mass** of research and technological development resources and skills

*Just what we need for RTD on dependability in Information Society*
Why is Dependability a priority for FP6

• Dependability is a key requirement for Information Society: it embraces all the usual attributes and properties of “critical systems

• There is a growing policy interest on dependability of information infrastructures and related interdependencies (economic security, protection of assets and IT investments, etc.)

• The IST Advisory Group identified dependability as an important topic for an Integrated Project

• Focussing on dependability implies stimulating an holistic reflection on our dependency on technology
Global collaboration on dependability

- **Rationale for collaboration** - The Information Infrastructure is global and arises global dependability concerns
- There are significant *technical and non-technical issues* that due to their scale and nature would benefit from a *global leverage of wider and diverse pool of skills and resources*
- September 11\(^{th}\) has changed the “picture” making **security and dependability concerns** a top priority on policy agendas
• **IST PROGRAMME**
  –http://www.cordis.lu/ist/

• **Deppy Forum**
  –http://deppy.jrc.it