Future Research Priorities in the Field of eInclusion and ICT

Patrick Roe

LEMA-EPFL, Switzerland

Session Technica – lineas tematicas de la catedra – Sevilla, 19.11.09

Structure of presentation

- New FP7 Coordination Action CARDIAC
- Some Challenges and Trends

Future Research Priorities

New FP7 Coordination Action under negotiation: CARDIAC

Coordination Action in R&D in Accessible and Assistive ICT

to define future research priorities in the field of eInclusion and ICT

WP4: Background

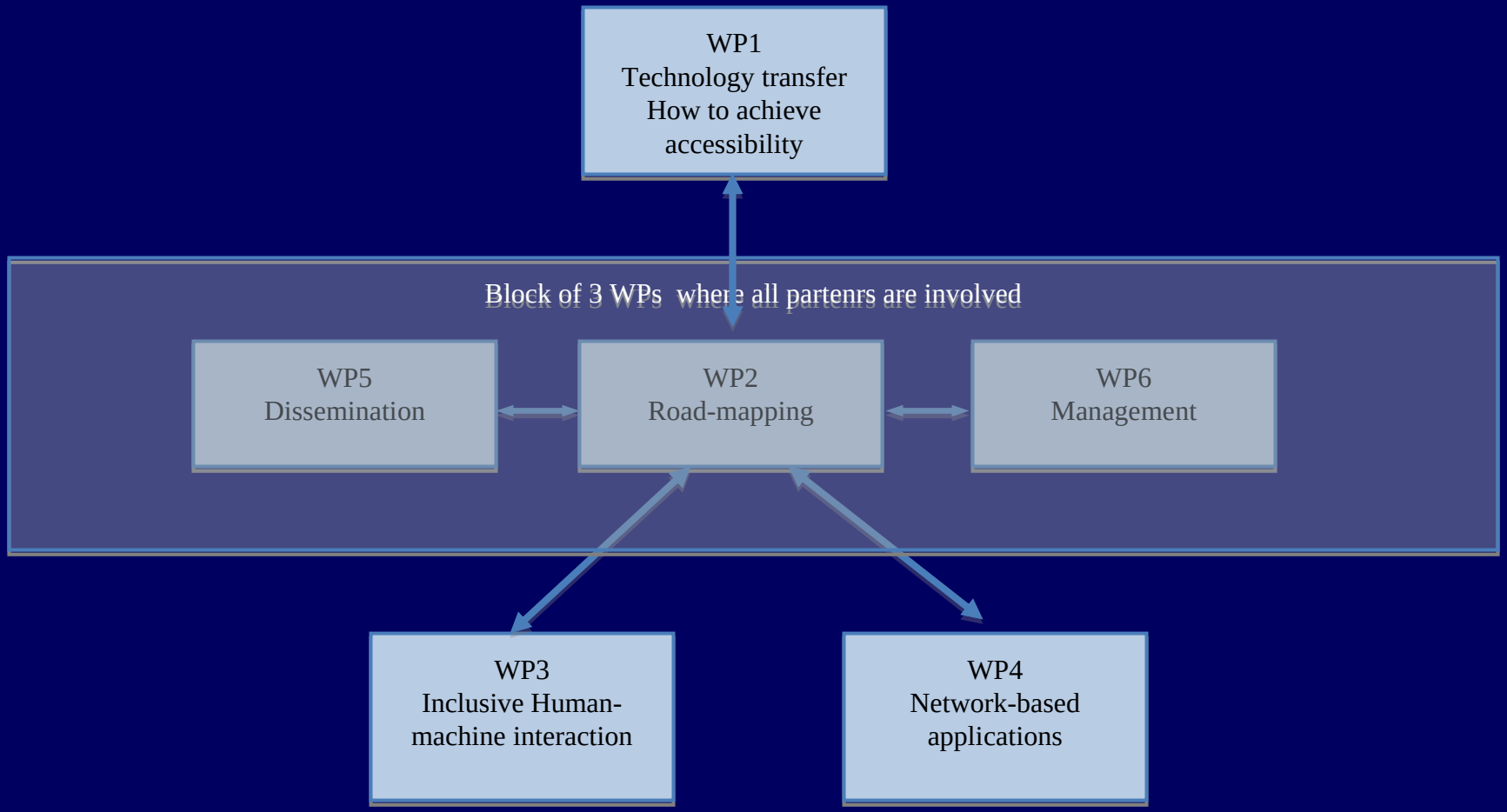
“e-Inclusion" means both inclusive ICT and the use of ICT to achieve wider inclusion objectives.

(excerpts from Pt. 4 MINISTERIAL DECLARATION APPROVED UNANIMOUSLY ON 11 June 2006, Riga)

Aims of the Coordination Action

- Consult widely with all the relevant stakeholders
- Indentify short/medium and long term research priority areas
- Produce research agenda roadmaps

Overall Structure



WP1: Technology-transfer

Background

- Successful technology transfer is a crucial element in ensuring the future viability of the accessible and assistive ICT market in Europe.

WP1: Objectives

- To identify the main factors that influence how accessible and assistive products are sold to consumers, in complex supply markets?
- To identify the existing supports for manufacturers or designers.
- To study organisational means and procedures in successful ICT development companies.
- To study the advancements in solutions for supporting developers in embedding generalised accessibility support within mainstream ICT-based products and services.

WP 3: Inclusive Human-Machine Interaction

Rationale:

- A large number of projects addressed accessibility and usability in user-system interaction
  - Diverse approaches, methodologies and technologies have been proposed
  - A combined approach is needed with a new relationship between Assistive Technology and Design for All

WP 3: Main objectives

- Identify research and development areas that could benefit the development of inclusive human interfaces accessible for all people
  - Indicating to industry what is needed,
  - Suggesting how the tasks could be approached
  - Stating the benefits that could be achieved

WP4: Network-based applications

Aspects to be considered:

- Ambient intelligence (cloud computing)
- Interoperability
- Mobility
- Mainstreaming (Design for All)
- Different application environments

WP4: Objectives

- To study the advancements in networks and services both in general (Web2.0, Semantic Web etc.) and from the perspective of eInclusion (WCAG2.0, support services, etc.)
- To point out research and developments activities that could be important in favouring eInclusion through the use of networks and services.
- To test the above results against a complex application of interest for eInclusion as a case study (possible example – eLearning)
- To approach the involved industry to spread these results

WP2 Road-mapping

- Consultation
- Gathering of position papers
- Structured Dialogic Design Process (SDDP) previously known as Interactive Management Co-Laboratory

Acknowledgements: Yiannis Laouris, Marios Michaelides & Dr. Aleco Christakis

Structured Dialogic Design Process

- Define triggering questions in consultation with relevant stakeholders
- Identify and key stakeholders for SDDP workshop

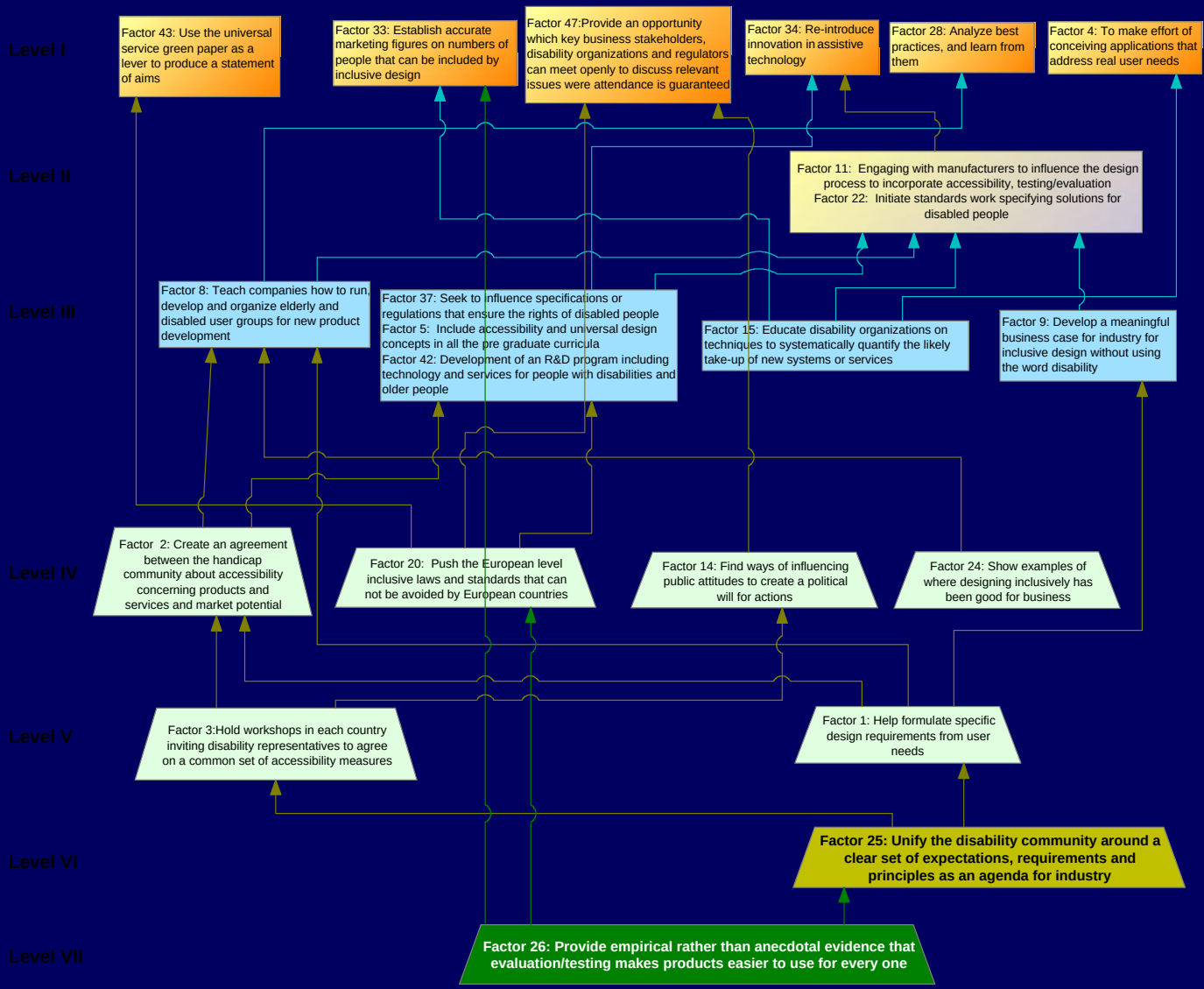
Example of triggering question

"What research actions, if supported, could facilitate the development of assistive technology embedded within Web2/3 applications?"

SDDP-Methodology

- Gather factors from participants
- Cluster factors
- Vote on factors
- Explore links
- Create Roadmap

Results: Road-map



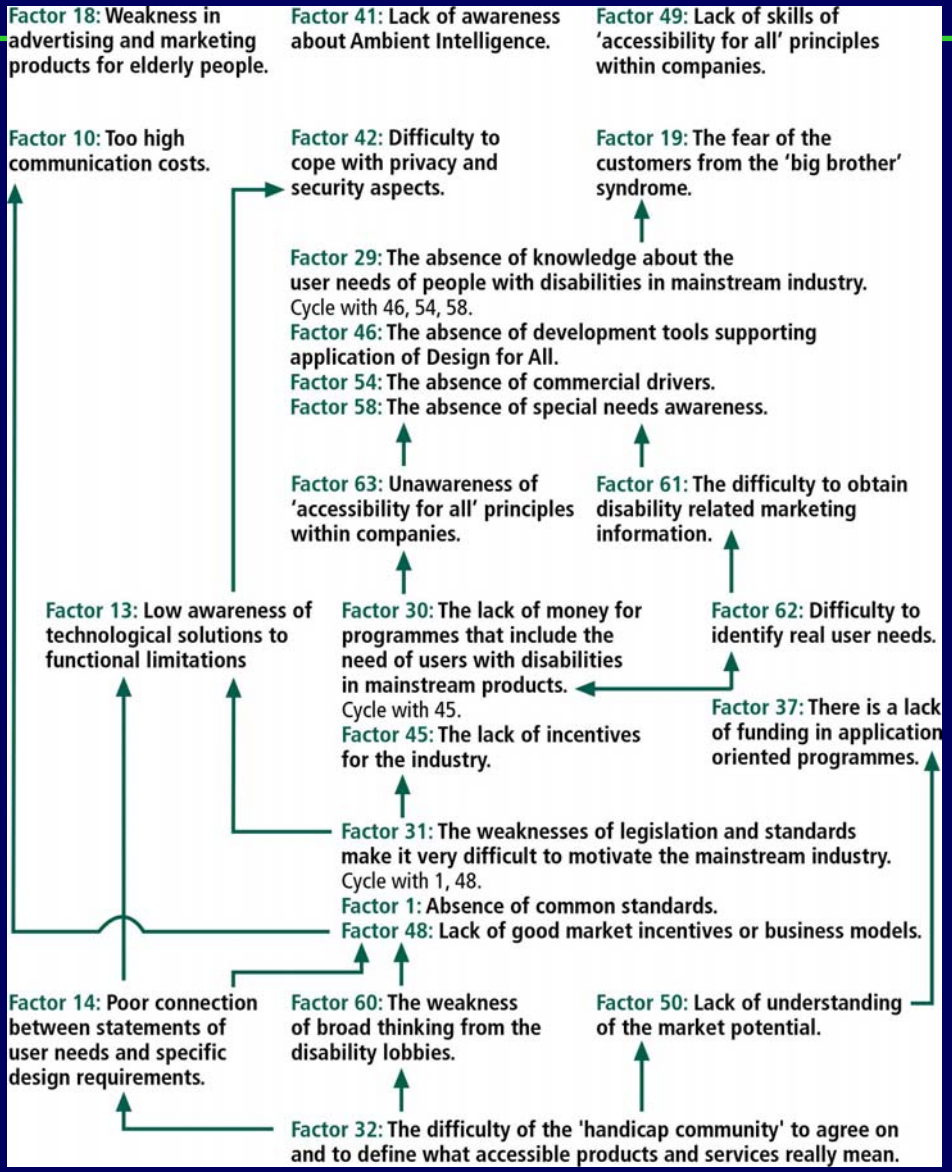
Most important factors preventing technology transfer

- The weaknesses of legislation and standards make it difficult to motivate mainstream industry
- The absence of knowledge about the user needs of people with disabilities in mainstream industry
- The lack of money for programmes that include the needs of users with disabilities in mainstream products
- Difficulty to cope with privacy and security aspects

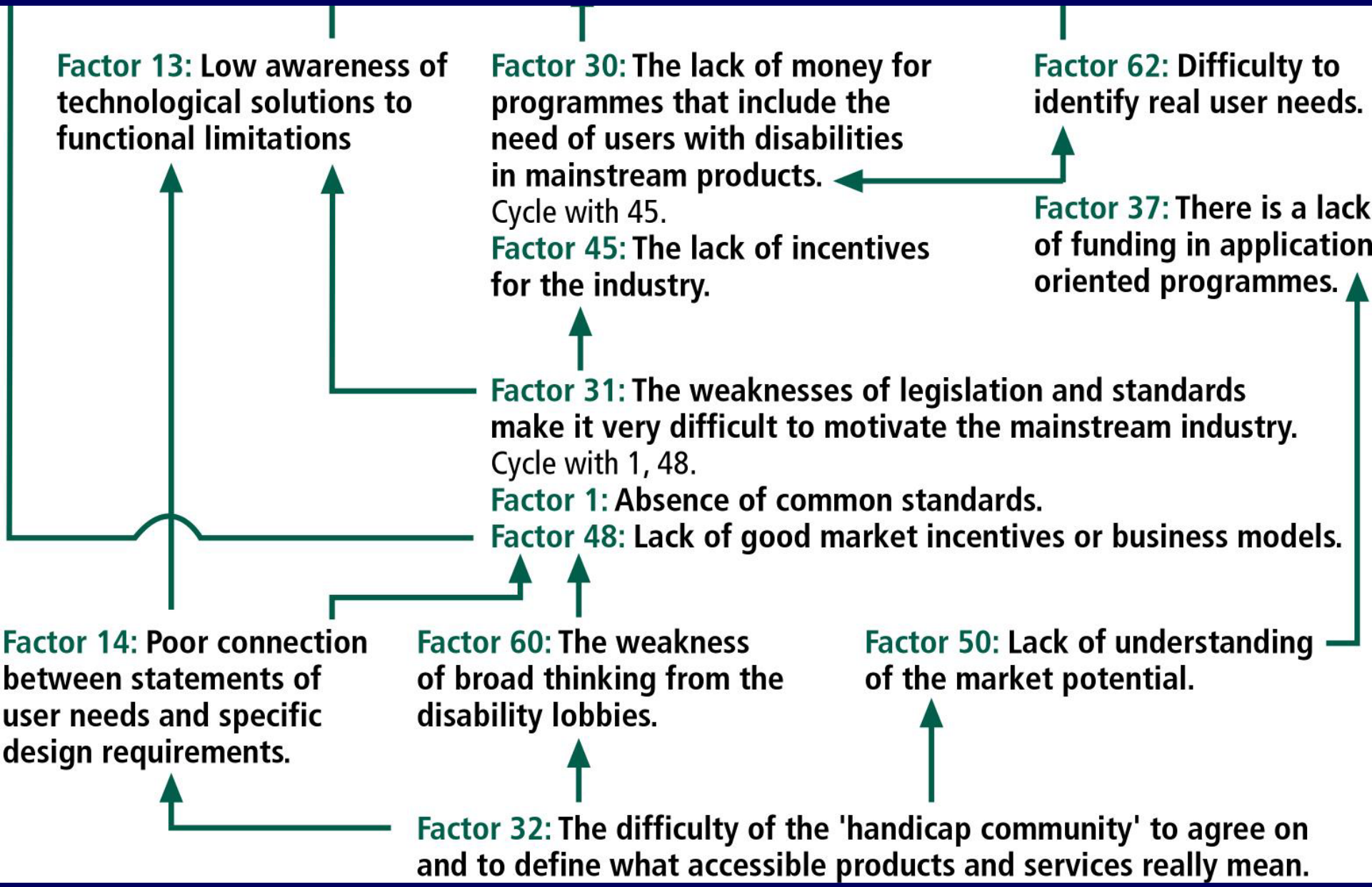
Most important factors helping technology transfer

- Engaging with manufacturers to influence the design process to incorporate accessibility testing/evaluation
- Develop a meaningful business case for industry for inclusive design without using the word disability
- Push the European level inclusive laws and standards that cannot be avoided by European countries
- Provide an opportunity in which key business stakeholders, disability organizations and regulators can meet openly to discuss relevant issues, where attendance is guaranteed

Figure 7.3



Taken from COST 219ter book, "Towards an inclusive future"



Taken from COST 219ter book, "Towards an inclusive future"

Some Challenges & Trends

- Interactions must be multimodal
- Voice recognition of connected speech in noisy environments
- Automatic translation into different languages
- Special vibrating materials producing three-dimensional tactile presentations of information
- Global positioning systems (GPS) that can be integrated with sensor networks in closed spaces

Technological Challenges - 2

- Gesture recognition to implement virtual keyboards and pointing devices
- Recognition of lip movement
- Corresponding animation technology to produce avatars able to sign and move lips
- Visualisation technologies (screens and virtual presentations)

Examples from AEGIS Project

- Generating Multi-lingual DAISY talking Books
- Zooming and magnifying functionality
- Video switch with webcam
- Modification of palettes in applications.
  For example reduction of menu choices for cognitive impaired users.
- Accessible blind impairment simulator

www.aegis-project.eu

Context of use

- Home networking & automation
- Mobile health management
- interpersonal communication
- Personalised information services

Key Enabling Technologies

- Embedded intelligence
- middleware and distributed systems
- IP mobile and wireless
- Multi-domain network management
- Converging core access networks

As identified by IST Advisory group - ISTAG

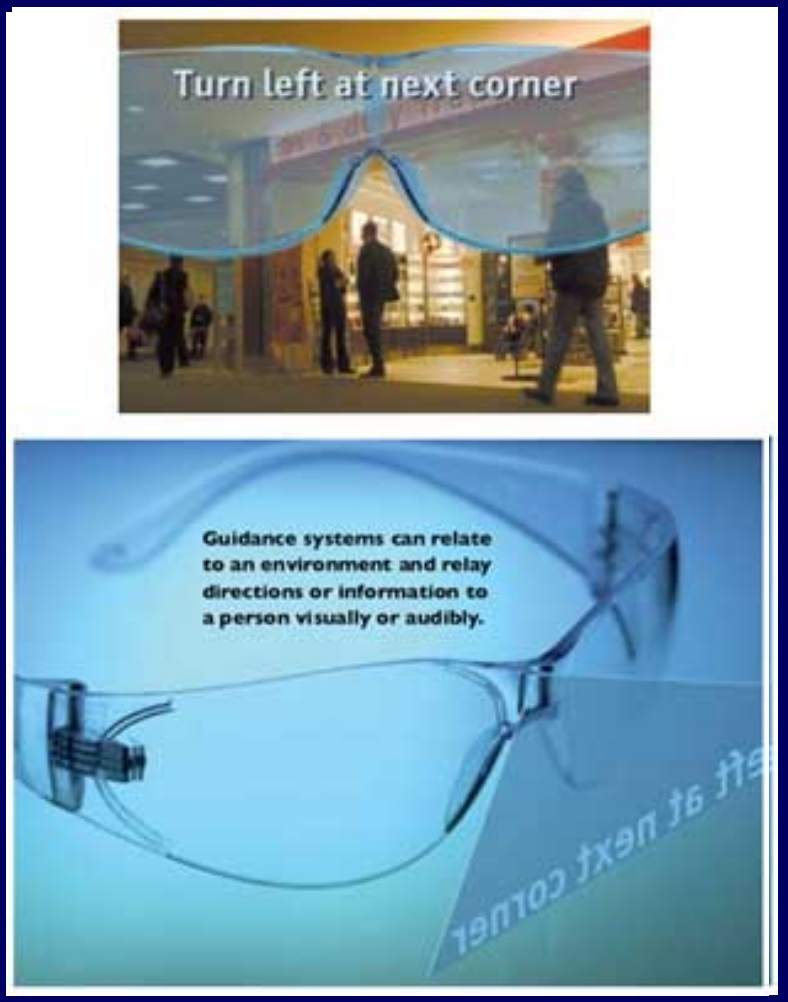
Key Enabling Technologies - 2

- Micro and opto-electronics
- Trust and confidence enabling tools
- Cross media content
- Multi-modal and adaptive interfaces
- Multi-lingual dialogue mode

As identified by IST Advisory group - ISTAG

Look into the future - 1

- Relay services available in the AmI environment
- Use of intelligent agents
- Home support
- Broadband communication facilities
- Navigation systems
- Open source



User perspective

- Relevant social factors and capabilities of people must be taken into account.
- Acceptability and uptake will depend on design that can “guess” user needs

- The system needs to be reliable, continuously available and consistent in its functionalities and interactions
- Ethical and privacy issues need to be addressed

Other relevant activities

- Raising the Floor initiative (USA)

  - National Public Inclusive Infrastructure (NPII)

    http://raisingthefloor.net/ http://NPII.org

- AEGIS Conference in Sevilla

  25-26 September 2010 www.aegis-project.eu

Conclusions

- Importance of understanding the potential of Ambient Intelligence and open source applications for older people and people with disabilities
- Importance of being able to translate user needs into a set of specific design requirements
- Importance of adopting a user-centred approach

Patrick.Roe@epfl.ch

Patrick.Roe@epfl.ch

Gracias