

**FP7 Preparation Workshop:
Technological research to contribute to inclusion**

Held at: Brussels, January 13-14, 2005

Summary of the outcomes

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Acknowledgments

On January 13 and 14, 2005 a FP7 preparation workshop on technological research in the eInclusion domain was held at the premises of the European Commission in Brussels. A group of experts from various European Member States as well as representatives from the European Commission participated in this event.

The aim was to elaborate perspectives on and requirements for future RTD in the eInclusion domain. The expert discussion was based on a start-up paper presented by the Commission. The paper characterised the domain under discussion and identified an initial set of critical RTD issues. Also, some initial suggestions on concrete RTD actions were made. This document comprises the rapporteurs' report summarising the outcomes of the subsequent expert discussion.

Disclaimer

The report on the workshop has been prepared by the eInclusion@EU project. It gives a summary of the discussions but does not represent formally the views of the European Commission or any of the contributors.

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1. Introduction

This document comprises the rapporteurs' report on the FP7 preparation workshop on technological research in the eInclusion domain that was held in Brussels on January 13 and 14, 2005. The report presents the outcomes of the discussions according to the following structure:

- The eInclusion concept
- The European context and rationale for addressing eInclusion
- The contribution that technological research can make to eInclusion
- Major goals and approaches in technological research on eInclusion
- Some key technological research themes and topics
- Examples of specific technology research tasks.
- Core guiding principles for the research programme.

2. The eInclusion concept

eInclusion is concerned with the goal of ensuring that everyone is included in and gains the benefits of the Information Society. As a starting point, the participants at the workshop adopted a basic perspective on eInclusion that incorporates two related yet distinguishable themes:

- Avoiding / combating the eExclusion of individuals or groups, addressing both exclusion from ICTs and the Information Society, per se, and new forms of social exclusion that may be caused by this
- Harnessing ICTs and the Information Society as a positive opportunity to enhance the social inclusion of individuals and groups.

3. The European context and rationale

The participants agreed on the importance of the eInclusion theme within FP7. It is a core issue for social, technological and economic policy now and its importance will continue and, in fact, increase during the lifetime of FP7 and beyond. RTD and related technological research activities can help to provide solutions to the challenges and opportunities that arise in relation to eInclusion.

A strong rationale for European level research activity was identified. Some of the main points were the following:

- The *Joint Report on Social Inclusion* in 2004 found that the eInclusion dimension was not being fully addressed in the national social inclusion strategies and programmes and that there is a need for a European-level approach on eInclusion to provide guidance and support for the national level approaches. In this context, two dimensions to eInclusion can be identified. On the one hand, there are risks of increased poverty and social exclusion that the rapid growth of the Information Society can bring. On the other hand, there are new opportunities for preventing and overcoming poverty and social exclusion that are presented by Information Society developments.

- In this context, the benefits of *co-operation and exchange* and bringing together experiences and skills on eInclusion challenges and solutions from different countries, regions and sectors has been highlighted
- There is a clear *trans-European dimension* to eInclusion. For instance, there is a strong need for internationally harmonised standards/requirements to make ICTs as well as current and emerging online services accessible and usable for people with disabilities and those who do not possess required eSkills. More generally, there is a need for a common vision and approach towards eInclusion so that it becomes a universal objective that is equally attainable everywhere in the EU.
- The increasing *interconnectedness* of systems and services, and of the technology base, means that the issues cannot be effectively addressed solely at the national level
- The *complexity* of the interplay between technological, economic and social factors in relation to eInclusion is such that it needs a concerted European-level effort
- The *industry/market/supply structure* has European/global as well as local dimensions, and requires European-level engagement and activity
- From a market and target group point of view, there is a need to generate a *critical mass* to ensure that the concerns of many small, scattered groups across Europe that can be affected by eInclusion are taken into consideration; this includes groups with rare conditions/problems
- *User groups* are also *fragmented* across Europe and require European-level actions to ensure that they are fully included in the efforts to address eInclusion challenges and opportunities
- The current *assistive technology industry* tends to be *fragmented*, SME dominated and often local – it needs a European-level dimension to increase competitiveness and meet the needs of citizens.

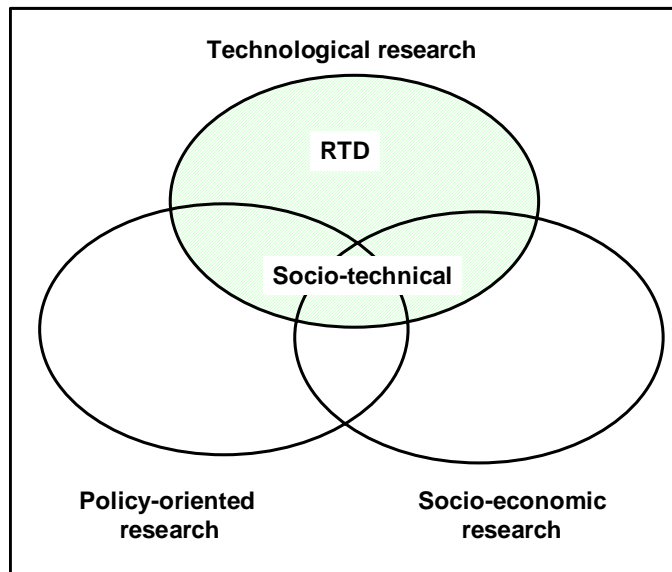
4. The contribution that technological research can make to eInclusion

A combination of factors – technological, economic, social and policy-related – are involved in eInclusion / eExclusion processes and outcomes. Research has a specific contribution to make to each of these domains and to the development of the cross-cutting solutions that are needed to effectively address many of the challenges.

4.1 Three core research domains

As regards the European Framework Programmes for Research and Technological Development, three core research domains can be identified – technological RTD, socio-economic research and policy-oriented research. All three have their own identities and coherence as regards the aspects of the domain they address, their research methods and so on.

Figure 4.1 Three core research domains



4.2 Technological research

As indicated in Figure 4.1, technological research includes RTD (oriented towards developing technologies, applications and services that contribute to eInclusion) and socio-technical research (technology-related research on aspects such as accessibility, usability, Design for All, social impact assessments, eSkills and so on).

There are linkages and cross-synergies between technological eInclusion research and the other research domains that have a contribution to make to the achievement of a cohesive Information Society. For instance, socio-economic research on the digital divide has shown that some population groups are at particular risk of being excluded from Information Society developments. Technological research can respond to such findings by facilitating the development of IST solutions that cater for the needs of the population groups concerned - for instance by means of adequate information design and suitable IST systems and applications. European policy on eInclusion requires a strong socio-technical evidence base to identify what actions are most effective and where to put energy and resources. Socio-technical approaches are required to support this, bringing together technological know-how, socio-economic and policy research skills in a multidisciplinary approach.

Figure 4.2 illustrates the relationship between technological research on eInclusion to general EU policy goals and with the other research domains relevant to the eInclusion theme. It also indicates the ways that eInclusion concerns can be addressed within the generic RTD chain.

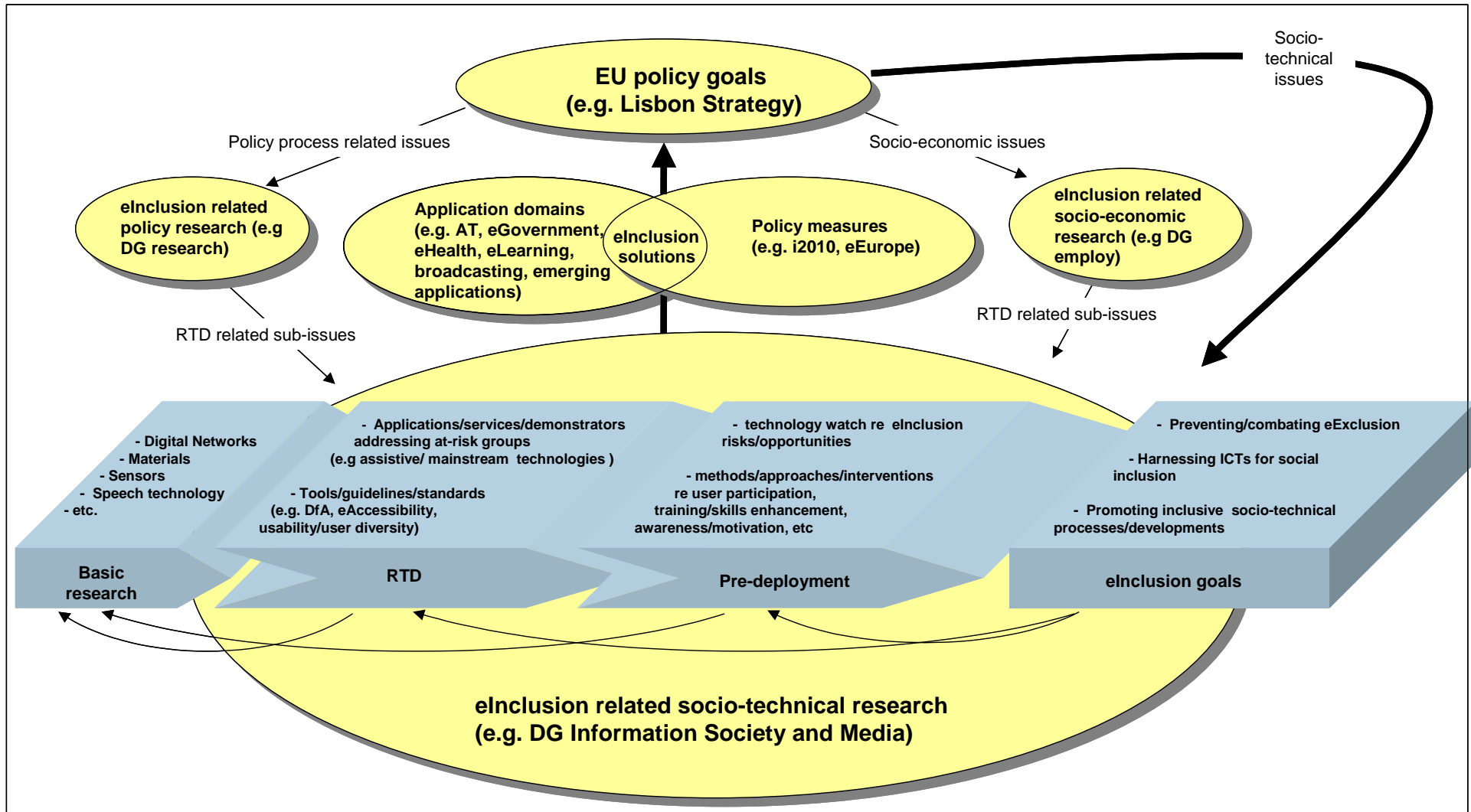
At the European Council in Lisbon on March 22-23 2000, the Union set itself the goal of becoming "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion." In those days, this vision was primarily directed towards the "old" Union. In the larger Union, characterised by a much greater disparity across Member States with respect to economic wealth, social cohesion, availability of telecommunications and broadband networks, and access to IST-based services, the goal set in Lisbon has become even more

pertinent. For the eInclusion domain, three guiding research goals emerge from this goal, namely:

- to prevent and combat eExclusion, i.e. to enable all citizens to participate in and benefit from the maturing Information Society - independent of their functional and mental abilities, their health status, their age, their gender, their income and socio-economic status, the place where they live, or any other structural life circumstances or personal characteristics that may hinder them to do so;
- to harness IST for achieving the general goal of social cohesion, i.e. to exploit the potentials IST may hold for fully integrating socially excluded population groups into the society;
- to promote inclusive socio-technical processes, i.e. to ensure that IST related processes which are going to shape the realities of the further maturing Information Society – such as e.g. IST related education and training – adequately consider the needs and requirements of population groups that are structurally disadvantaged in the sense described above.

As shown in Figure 4.2, technology-related research on eInclusion covers all stages of the RTD chain – basic research, RTD and pre-deployment / exploitation actions.

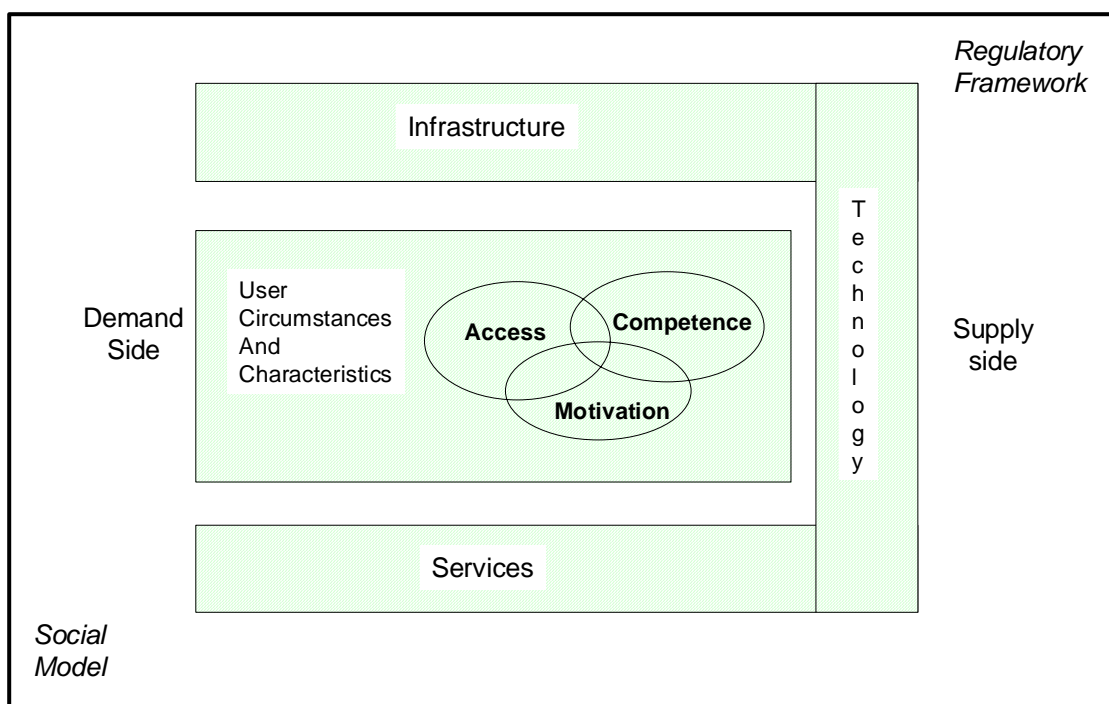
Figure 4.2 Schematic view of the contribution of eInclusion RTD and socio-technical research



4.3 Demand, supply and contextual factors

The research programme on eInclusion under FP7 needs to take into account the interplay between demand side, supply side and contextual factors in regard to eInclusion. This is illustrated schematically in Figure 4.3.

Figure 4.3 Demand and supply side factors



On the demand side, user's circumstances and characteristics impact on three core determinants of eInclusion / eExclusion – access, motivation and competence. These can be expected to play a determining role in relation to utilisation of ICTs. Key aspects of the supply side include infrastructures (e.g. telecommunications networks), services (e.g. eHealth, eGovernment and eLearning) and their characteristics (e.g. usability, accessibility, multilinguality, relevant content) and the technologies that underpin these. Relevant aspects of the contextual environment include the regulatory framework (e.g. universal service provisions in telecommunications) and the social model (e.g. social inclusion policies).

Integrated research that addresses all of these dimensions in a co-ordinated manner will be needed in order to address the challenges of eInclusion.

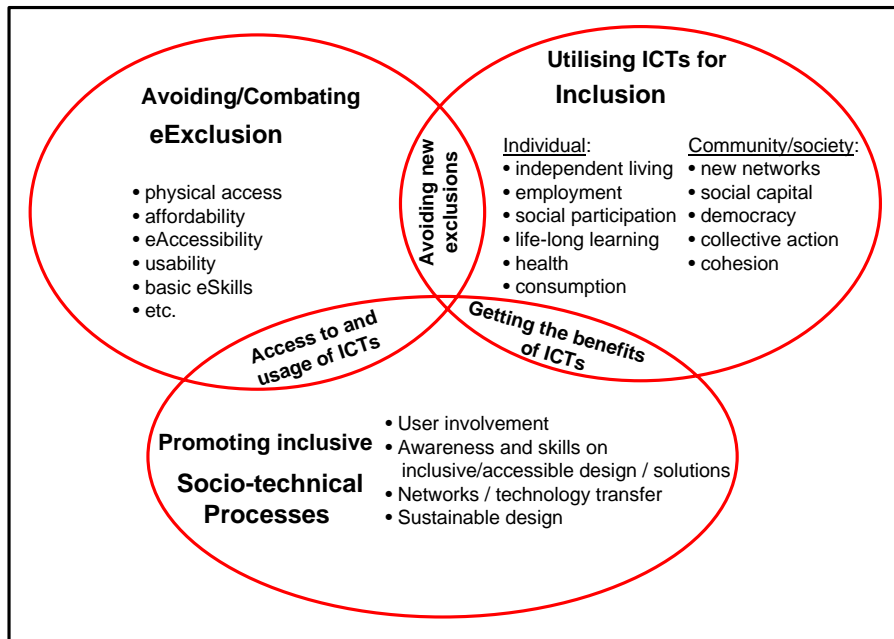
5. Main technology research goals and themes

As already noted earlier, three core technology research goals and associated thematic areas can be identified:

- Avoiding/combating eExclusion
- Utilising ICTs for inclusion
- Promoting inclusive socio-technical processes.

The scope of these thematic areas is indicated in Figure 5.1.

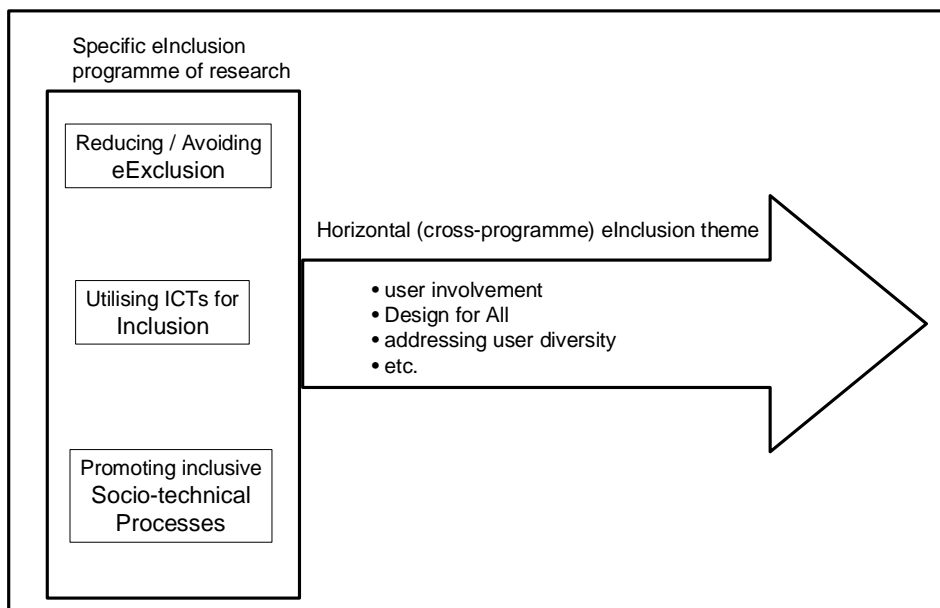
Figure 5.1 Core RTD / socio-technical goals and themes



5.1 A dedicated research theme and a horizontal cross-programme approach

Another aspect highlighted by the participants was the need for both a dedicated research theme addressing eInclusion and a horizontal cross-programme approach that would seek to mainstream eInclusion concerns in all relevant parts of FP6. This is schematically illustrated in Figure 5.2.

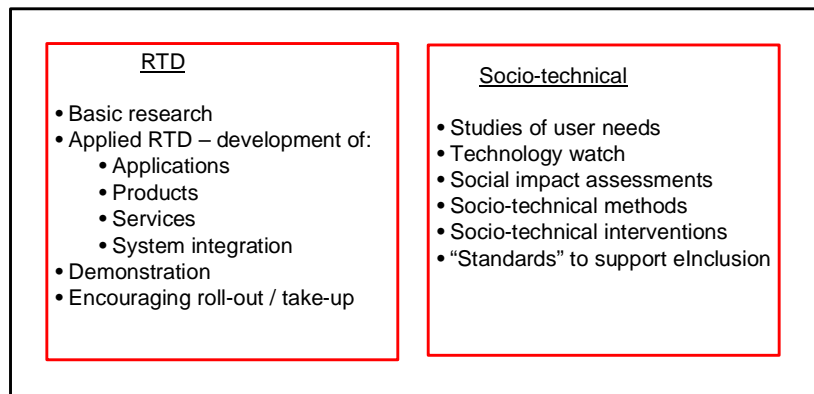
Figure 5.2 A specific research programme and a horizontal approach



5.2 Types of research activities

Figure 5.3 shows the types of research activity that are needed for the eInclusion domain. On the RTD side, there is a need for basic research, applied RTD, demonstration and roll-out / take-up activities. On the socio-technical side there is a need for studies of user needs, technology watch, social impact assessments, development of socio-technical methods and interventions, and standards to support eInclusion.

Figure 5.3 Types of research activities



6. Some key research topics and technologies

Participants also gave some attention to identifying key technologies that have a role to play in the development of eInclusion solutions. These are listed in Table 6.1.

Table 6.1 Some key technologies for eInclusion

- More natural interface techniques (voice / speech recognition, movement sensors, etc.)
- Intelligent interfaces (to predict / interpret what user wants)
- Semantic web / intelligent agents (for differentiating services to meet user diversity)
- Real time text (as mainstream communication mode and as an alternative interface; technology interoperability is important here)
- Advanced wearable interfaces (e.g. spectacle displays)
- Intelligent clothing / fibres (to detect and respond to changes in person / environment)
- Intelligent sensors and communication devices (RFID tags)
- Intelligent expert systems (to support service access and provision)
- Next generation WIFI (low power, digital TV applications etc.)
- WLAN 2 (for community networks)
- Ambient intelligence (e.g. to support independent living)
- Multi-modality, multi-functionality and miniaturisation (new opportunities and new accessibility challenges)
- Digital TV applications and services
- Location based techniques
- Augmented reality
- Advanced software techniques (content management, metadata, knowledge management tools)
- Robotics
- Intelligent transport
- Embedded systems

Table 6.2 provides an integrated overview of the main research themes and approaches, with some indicative examples of technological research areas.

Table 6.2 Integrated overview of research themes, approaches and indicative technologies

	Reducing / Avoiding eExclusion	Utilising ICTs for Inclusion	Promoting inclusive Socio-technical Processes
Themes	<ul style="list-style-type: none"> • Accessibility • Usability • Catering for diversity • Affordable access • Community access • Relevant content • User motivation and skills (basic) 	<ul style="list-style-type: none"> • Independent living • Access to employment • Social participation • Lifelong learning • Health • Consumers • Democracy • Avoiding new exclusions • User motivation and skills (higher) • Community networks • Cultural protection / development 	<ul style="list-style-type: none"> • Accessibility / DfA toolkits • Social shaping of technology • Actor awareness / training • Inclusive industry RTD • “Standards” to support eInclusion • Exploit existing solutions / TT • Demand side initiatives to promote access, skills, motivation, usage
Technical approach	<ul style="list-style-type: none"> • RTD • Demonstration • Take-up measures • Socio-technical research (user needs, social impacts, etc). 	<ul style="list-style-type: none"> • RTD • Demonstration • Take-up measures • Socio-technical research (user needs, social impacts, etc). 	<ul style="list-style-type: none"> • Method development (socio-technical methods, user involvement, DfA etc.) • Technology and socio-technical watch / forecasting • Technology transfer • Awareness raising and skill development
Examples of Key technologies	<ul style="list-style-type: none"> • eAccessibility, eUsability and Design for All solutions • Low cost solutions • New tools for eSkilling • Natural / intelligent interfaces • Digital TV • Community-wide access networks (e.g. WLAN2) 	<ul style="list-style-type: none"> • Smart homes / ambient intelligence • Inclusive eLearning platforms • Advanced software (content management, metadata, knowledge management) • Semantic web / intelligent agents • Intelligent clothing / fibres • Inclusive virtual networks 	

Participants outlined a wide range of suggested research topics that could be addressed under the eInclusion research of FP7. These are listed in Annex 1 and provide an indicative rather than exhaustive view of what could be included within the scope of the programme.

7. Examples of specific technology research tasks

The participants also developed some examples of specific technology research tasks. In total, six such examples were prepared, covering:

- voice-recognition based services
- usable and suitable services that cater for diversity
- devices and interfaces to address needs of older people and others in the context of increasing complexity
- social impact assessment
- diffusion of Design for All approaches
- new technologies and approaches to foster eSkills among low education groups.

7.1 Understanding the social impacts of ICTs

<p><i>Overview and background</i></p>	<p>Although it is clear that ICTs and the Information Society are extensively permeating throughout everyday life, we still have only a very limited view of the social impacts that this is having and of how it is affecting social inclusion processes for better or worse. There is a need for focused socio-technical research on these issues in order to assess the significance of ICTs for social inclusion and to identify the priorities for attention in RTD and in wider policy formulation.</p>
<p><i>Objectives and issues</i></p>	<p>The objectives of the research on this theme are as follows:</p> <ul style="list-style-type: none"> - To identify the key technologies, applications and services that are having or are likely to have important social impacts - To measure and assess the types of impacts that they are having across society and for particular groups - To assess the links between eInclusion and social inclusion - To identify key social impact themes and target groups for attention in RTD and in wider policy
<p><i>Technical approach</i></p>	<p>The following are some of the technical approaches that will be needed:</p> <ul style="list-style-type: none"> - Sociological and socio-economic research on how ICTs are being deployed and used - Measurement and benchmarking of digital divides, including basic and second-order divides - Socio-economic assessments of the individual and societal impacts of such digital divides - Technology watch and assessment to identify emerging and future issues with potentially high social impact
<p><i>Results and expected impacts</i></p>	<p>The following results and impacts are expected:</p> <ul style="list-style-type: none"> - Enhanced evidence-base to inform eInclusion and social inclusion policy - Better understanding of the social dimensions and impacts of ICTs to facilitate more socially-aware and socially-focused RTD programmes and projects

7.2 Diffusion of Design for All approaches

<p><i>Overview and background</i></p>	<p>The Design for All approach focuses on the design and development of ICT products and services to meet the widest possible range of users and usage contexts. It is central to providing accessibility for people with disabilities and to cater for the diversity of users and potential users in Europe. There are two challenges to be met if the Design for All approach is to become mainstreamed in the design process in Europe. Firstly, although there is already a lot of knowledge and expertise available, there is still further work needed to operationalise the approach in ways that can be readily adopted and applied in the real-world design and development cycles of ICT products and services. In addition, there is a need to promote awareness and to provide training for all relevant parties.</p>
<p><i>Objectives and issues</i></p>	<p>The objectives of the research on this theme are as follows:</p> <ul style="list-style-type: none"> - To further develop and improve the available repertoire of solutions and methods to contribute to Design for All - To make these methods and solutions available in effective formats so that they are comprehensive yet easy to apply in the real world of designers and other ICT professionals - To ensure that all relevant ICT professionals (inside and outside FP7) are equipped with the skills to employ the Design for All approach in their work - To ensure that all relevant ICT professionals (inside and outside FP7) are aware of the Design for All approach and can see the value of using it in their work
<p><i>Technical approach</i></p>	<p>The following are some of the technical approaches that will be needed:</p> <ul style="list-style-type: none"> - Research and development on solutions to the accessibility barriers that still exist for people with disabilities, on the changes associated with ageing and how these can be addressed in the design process, and on broader approaches to catering for the increasingly diverse user (and potential user) base - Preparation of tailored Design for All toolkits - Development and delivery of training in Design for All, inside and outside FP7 - Design and delivery of awareness raising and motivational campaigns
<p><i>Results and expected impacts</i></p>	<p>The following results and impacts are expected:</p> <ul style="list-style-type: none"> - Widespread utilization of Design for All approaches in the ICT design and development process - Elimination of many design barriers that are currently obstacles to inclusion

7.3 Fostering eSkills among low education groups

<i>Overview and background</i>	Despite advances in the provision of universal education in Europe, there still remain many people who have had very limited formal education and many who have functional literacy problems. These groups are at a significant disadvantage as regards gaining the eSkills that are needed to use and gain the benefits from ICTs. Some of the more innovative possibilities for the development of ICT skills are based on ICT-based applications such as eGames, eLearning techniques and augmented / virtual reality. To be successful, these tools need to be shaped to suit the interests and cultural characteristics of the less educated target groups. This requires collaborative socio-technical design and development approaches that empower less educated people to specify their own preferences and needs as regards eSkills development.
<i>Objectives and issues</i>	The objectives of the research on this theme are as follows: <ul style="list-style-type: none"> - Exploit the potential offered by innovations in eGames, eLearning and augmented / virtual reality to support the development of eSkills for less educated people - Enable and empower less educated people to contribute to the development of innovative approaches to eSkilling that suit their preferences and needs
<i>Technical approach</i>	The following are some of the technical approaches that will be needed: <ul style="list-style-type: none"> - RTD on innovative pedagogical approaches that exploit developments in eGames, eLearning, augmented / virtual reality and other relevant ICT-based innovations - Methods to empower less educated people to participate in and shape the development of solutions to their eSkill needs
<i>Results and expected impacts</i>	The following results and impacts are expected: <ul style="list-style-type: none"> - eSkills solutions that meet the needs and preferences of less educated people - Increased eSkills amongst less educated people

7.4 Devices and interfaces to address needs of older people and others in the context of increasing complexity -

<p><i>Overview and background</i></p>	<p>ICT-based communication and service processes – e.g. in the fields of health/social care, education, leisure, commerce, personal interaction and intelligent home management - are increasingly penetrating the domestic sphere. In the public sphere, touch screen information kiosks are becoming ubiquitous, and the next-generation digital media kiosks are supposed to soon enable travellers, vacationers and shoppers to download music to MP3 players, print vacation photos or purchase games. Also, for an ever increasing part of the population, mobile telephony is becoming a day-to-day experience, and enhanced capabilities such as emergency functionalities and location-based services are beginning to transform the mobile phone from a mere communication tool into a multifunction device enabling location-independent utilisation of online services and content. On the one hand, ICT-enabled interaction and communication processes – and the interfaces and devices applied respectively - are becoming increasingly complex. On the other hand, innovative technologies – e.g. intelligent agents or semantic web - enable more intelligent services, interfaces and devices that are capable of better catering for individual user needs and capabilities. These need to be harnessed to enable participation of disadvantaged user groups such as people with limited reading skills, intellectual disabilities or functional restrictions in ICT-mediated service/communication processes.</p>
<p><i>Objectives and issues</i></p>	<p>The objectives of the research on this theme are as follows:</p> <ul style="list-style-type: none"> - Exploit the potential offered by innovative technologies to enable participation of disadvantaged user groups in ICT-based interaction/communication processes - Enable and empower disadvantaged user groups to contribute to the development of innovative services, applications and devices that suit their preferences, needs and capabilities
<p><i>Technical approach</i></p>	<p>The following are some of the technical approaches that will be needed:</p> <ul style="list-style-type: none"> - RTD on innovative technologies and other relevant ICT-based innovations to exploit their potential for better catering for the needs and user requirements of disadvantaged population groups - Methods and tools to empower disadvantaged user groups to participate in and shape the development of interaction/communication solutions to their user needs and requirements
<p><i>Results and expected impacts</i></p>	<p>The following results and impacts are expected:</p> <ul style="list-style-type: none"> - ICT-based services, applications and devices catering for the needs and requirements of disadvantaged user groups - Increased participation of disadvantaged user groups in ICT-enabled interaction and communication processes - Increased participation of disadvantaged users in the development and shaping of communication/service processes

7.5 Usable and suitable online services that cater for diversity

<p><i>Overview and background</i></p>	<p>Online provision of both commercial and public services is gaining in momentum. However, for being able to achieve a truly inclusive online world generic approaches and practical solutions are needed that enable to cater for a broad spectrum of users including inexperienced ICT users, people with various disabilities, with age-related restrictions, with confined reading skills and others facing some sort of structural difficulties in utilising online technologies and/or content. Although there is already a lot of knowledge and expertise available in relation to the needs/requirements specific groups have - e.g. with respect to web accessibility for people with visual impairments - there is still further work needed to develop solutions capable of meeting diverse user requirements at the same time. This concerns a range of aspects such as accessible/usable interfaces and information design, suitable access technologies and devices as well as appropriate service content and process design.</p>
<p><i>Objectives and issues</i></p>	<p>The objectives of the research on this theme are as follows:</p> <ul style="list-style-type: none"> - Understand the needs, requirements and aspirations of the various user groupings facing structural problems in utilizing current online technologies and/or content - Exploit the potential offered by innovative online technologies and emerging access platforms to develop online services that cater for the needs and requirements of a broad range of users - Promote wider implementation of fully inclusive online services - Enable and empower disadvantaged user groups to contribute to the development and shaping of innovative online services that suit their preferences, needs and aspirations
<p><i>Technical approach</i></p>	<p>The following are some of the technical approaches that will be needed:</p> <ul style="list-style-type: none"> - Socio-technical research to better understand the factors impeding different user groups in utilizing current online technologies and/or content. - RTD on innovative technologies and other relevant ICT-based innovations to exploit their potential for better catering for the needs and requirements of diverse user groupings - Methods and tools to empower disadvantaged user groups to participate in and shape the development of solutions to their user needs and requirements - Socio-technical research to better understand the factors impeding wider implementation of fully inclusive online services - Promotional measures directed towards the wider implementation of fully inclusive online services
<p><i>Results and expected impacts</i></p>	<p>The following results and impacts are expected:</p> <ul style="list-style-type: none"> - Online services catering for the needs and requirements of a diverse range of user groupings, including those who tend to be excluded from the current online world - Increased implementation of fully inclusive online services, i.e. of services that are accessible, usable and appropriate for diverse user groupings - Increased participation in online services among population groups that are disadvantaged in terms of access, usability, appropriateness and usefulness of current technologies/content - Increase participation of disadvantaged groups in the development and shaping of main stream online services.

8. Voice-recognition based services

<i>Overview and background</i>	The IST environment that is supposed to evolve over the current decade will be characterised by computing and networking technologies embedded in an increasing range of everyday objects that are interconnected in web-like structures. The deployment of advanced interfaces that support diverse user communities in communicating, cooperating and accessing online public/private services via an ambient intelligent environment constitutes an essential step towards overcoming information- and communicative exclusion of those who have problems to operate current ICT devices and interfaces, e.g. due to certain functional restrictions they have, lacking ICT/eSkills or confined intellectual/writing capabilities. For many of those natural language would be the most appropriate mode of interaction with machine interfaces. Despite the advances that have been achieved in the field of speech recognition technology there is a need for further RTD to be able to handle a variety of different environments, spontaneous speech effects such as hesitations, individual speech deficiencies and difference between sexes, dialects, national languages and so on.
<i>Objectives and issues</i>	The objectives of the research on this theme are as follows: <ul style="list-style-type: none"> - Exploit the potential offered by advanced speech technology to develop voice recognition based services that support user communities facing problems in operating/using non voice-based devices/services. - Enable and empower disadvantaged user groups to contribute to the development and shaping of innovative voice-based services that suit their preferences, needs and aspirations
<i>Technical approach</i>	The following are some of the technical approaches that will be needed: <ul style="list-style-type: none"> - RTD on innovative speech technologies to exploit their potential for the development of advanced man machine interfaces and related services - Methods and tools to empower disadvantaged user groups to participate in and shape the development of solutions to their user needs and requirements
<i>Results and expected impacts</i>	The following results and impacts are expected: <ul style="list-style-type: none"> - Voice based devices and services that cater for the particular needs of those facing problems in interacting in non-voice based modes - Increased participation in ICT enabled communication and service processes of people facing problems in interacting in non-voice based modes - Increased acceptance of IST mediated communication and services processes among the overall population - Increase participation of disadvantaged groups in the development and shaping of emerging IST environments

9. Services and applications

Finally, the participants identified some core guiding principles for the technological research to be supported under the eInclusion theme of FP 7. These include:

- High social value

- User involvement
- Empowerment

9.1 High social value

One central requirement is that the funded research must have high social value. Although eInclusion clearly has an important economic dimension, both in terms of increasing the markets for European ICT industries and in enhancing economic performance more generally, the social benefits for citizens must be kept to the fore in the eInclusion research. Projects should clearly address issues that are of high social importance and convincingly demonstrate that they have the capacity to have substantial positive social impacts.

9.2 User involvement

Another central requirement is to have extensive user involvement in all aspects of the technological research. eInclusion is as much a process as an outcome and users must be actively included in all aspects of the work. Innovative approaches to involving users and substantial resource allocations to this part of the work should be given a high weighting.

9.3 Empowerment

Finally, the research in this area must avoid the top-down imposition of solutions on those who are at risk of exclusion. The aim should be to empower those at risk of exclusion to articulate their own needs and to identify the most appropriate ways of meeting these needs. This will require innovative project structures and consortia, where technological know-how and resources are made available to those who are at risk of exclusion. In this way, technological developments can be socially shaped and better tuned to real needs.

Annex 1: Indicative list of eInclusion research topics / issues

- intellectual disability / low literacy (increasing complexity) / intelligent agents
- lack of exploitation of existing solutions (there is a need for these to be implemented)
- knowledge on user diversity and how to address this
- deeper understanding of user needs – common needs across groups
- increasing the involvement of public sector players
- empowerment of users
- build on / add to existing work (e.g. provide concrete evidence for INCOM report - assessment of accessibility of emergency services in Europe; back-up policy etc.)
- awareness and training of professionals (engineers, designers) – cross-disciplinary etc. (college and industry)
- how can eInclusion contribute to social inclusion, and vice versa
- assistive technology (smart homes, places,...)
- multi-media / multi-modality
- need for invisibility (of functionality) for ease of use / “technology for dummies”
- technology watch to identify new barriers to inclusion due to technology
- user involvement – need to address user diversity (how to do it in practice)
- low cost technologies
- technology for communities
- physical access
- networking of actors (e.g. in assistive technology industry)
- who gets the benefits in multi-player situations (e.g. where municipality pays but benefits may not accrue directly for them)
- basic research – technology watch for new opportunities and new barriers – e.g. intelligent wearables
- augmented reality
- International dimension – developing countries
- sustainable computing
- new problems (goods and services may be cheaper when purchased online, eServices are sometimes becoming the only way to access particular services etc...)