



European SeniorWatch Observatory and Inventory -
*A market study about the specific IST needs of older and disabled people
to guide industry, RTD and policy*

www.seniorwatch.de

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Older People and Information Society Technology

Policy Recommendations

Relates to WP 5 / Deliverable no. 5.4

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Short Description:

As outlined in the analytical and conceptual framework developed within work package one (see D1.2) of the overall project, SeniorWatch seeks to consider both market and policy objectives. In relation to EU policy objectives, the SeniorWatch approach seeks to ensure that the goals of both social and information society policy are addressed in a balanced, integrated and complementary manner. From the social policy perspective, issues of particular relevance include labour market participation by family carers of dependant older people, the "active ageing" paradigm, and the need to promote innovation in care services for older people. From the information society policy perspective, the most relevant objectives include the general desire to accelerate the Information Society for social and economic benefits, to ensure participation by all citizens, including older people, and to promote more competitive European IST industries .

This report and the work in task 5.4 is set against this background, which aims to integrate all relevant policy material from the preceding deliverables in order to derive strategic recommendations for relevant market players. In this sense, the individual recommendations presented here rely upon data and information provided in previous SeniorWatch reports. For those readers who wish to follow up any particular issue raised in this deliverable a range of project reports will be made available on the SeniorWatch website (www.seniorwatch.de).

The recommendations derived from the various strands of work undertaken within the overall project are organised at two levels. Firstly, some recommendations addressed directly towards current and future EU policy and action in relevant areas are presented. Then, a detailed discussion of the recommendations proposed is presented according to the three IST domains addressed within SeniorWatch (general purpose IST, care-related IST, accessibility-related IST), the issues to be addressed in each domain and the actors concerned with the recommended action.

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The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the European Commission.

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1 Introduction

As outlined in the analytical and conceptual framework developed within work package one (see D1.2) of the overall project, SeniorWatch seeks to consider both market and policy objectives. In relation to EU policy objectives, the SeniorWatch approach seeks to ensure that the goals of both social and information society policy are addressed in a balanced, integrated and complementary manner. From the social policy perspective, issues of particular relevance include labour market participation by family carers of dependant older people, the "active ageing" paradigm, and the need to promote innovation in care services for older people¹. From the information society policy perspective, the most relevant objectives include the general desire to accelerate the Information Society for social and economic benefits, to ensure participation by all citizens, including older people, and to promote more competitive European IST industries².

This report and the work in task 5.4 is set against this background, which aims to integrate all relevant policy material from the preceding deliverables in order to derive strategic recommendations for relevant market players. In this sense, the individual recommendations presented here rely upon data and information provided in previous SeniorWatch reports. For those readers who wish to follow up any particular issue raised in this deliverable the following sources of information are available:

- Deliverable no. 1.2: SeniorWatch Analytical and Methodological Framework, January 2002
- Deliverable no. 2.1: Survey Design and Questionnaires, April 2001
- Deliverable no. 3.2: Technology Watch Report, May 2002
- Deliverable no. 4.1: Country Reports, March 2002
- Deliverable no. 4.2: Preliminary Case Studies, May 2001
- Deliverable no. 4.3: Final Case Studies, February 2002
- Deliverable no. 5.1: Older People and Information Society Technology - A Comparative Analysis of the Current Situation in the European Union and of Future Trends, April 2002
- Deliverable no. 5.2: Older People and Information Society Technology - A Global Analysis, June 2002
- Deliverable no. 5.3: Older People and Information Society Technology – An Analysis of Facilitating and Constraining Factors, July 2002
- Deliverable no. 5.4: Older People and Information Society Technology – Policy Recommendations, July 2002
- Deliverable no. 6.2B: SeniorWatch Website (www.seniorwatch.de)

For the purpose of identifying the relevant actors the recommendations presented in this report target and the related options for action, the generic model of the "demand-supply space" of relevant ISTs (Figure 1) was utilised. This model is described in more detail in the

¹ European Commission. (1999). Towards a Europe for All Ages. Brussels: COM (1999) 221 Final. Follow-up Conference on "New Paradigm in Ageing Policy". Nov. 15-16, 1999. .

² eEurope 2002: An information Society for All. Action Plan. Prepared by the Council and the European Commission for the Feira European Council, 19-20 June 2000. The eEurope 2002 update: Prepared by the European Commission for the European Council in Nice, December 7-8, 2000.

following sections of this [chapter 1](#) to enable a better understanding of how the actual recommendations presented in the following chapter 2 of this document were derived. This starts with a description of the demand side in [section 1.1](#). Here, different types of ISTs as well as different types of demand are identified for consideration. Following this, the supply side is briefly described in [section 1.2](#). Here, our generic model addresses both the products and the services themselves, and the supply chains through which they reach older people and/or institutional markets. Finally, the various environmental features that can influence the demand and supply sides are identified in [section 1.3](#).

The actual recommendations derived from the various strands of work undertaken within the overall project are then presented in [chapter 2](#). This starts, in [section 2.1](#), with a presentation of some recommendations addressed directly towards current and future EU policy and action in relevant areas. Then, a detailed discussion of the individual recommendations proposed is presented in [section 2.2](#) according to the three IST domains addressed in SeniorWatch (general purpose IST, care-related IST, accessibility-related IST), the issues to be addressed in each domain and the actors concerned with the recommended action.

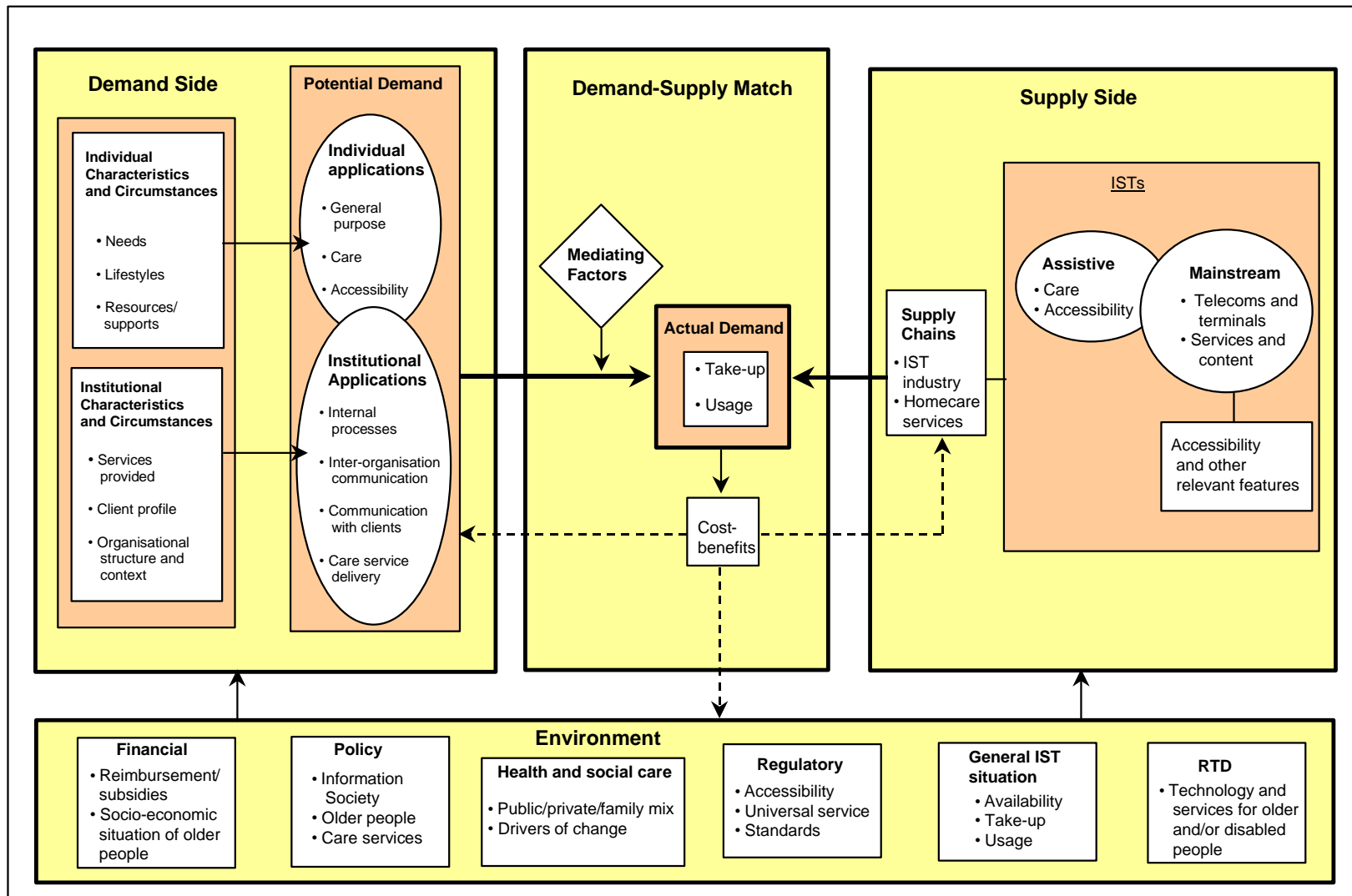
1.1 Demand side issues

Two demand segments are identified in the generic demand-supply model presented in Figure 1, namely “individual” (consumer) demand and “institutional” demand. Demand at the individual (consumer) level can include both demand from older people themselves and demand from other family members, whether living in the same household or another household. In many cases, older people themselves will also be the consumer to make the decision whether to adopt IST products or services and pay for them themselves. In other cases, family members represent an important part of the market for ISTs for older people; for example, in some countries family members organise and pay for social alarm services. It is also worth noting that the mobile telephone market amongst older people has been significantly boosted by family members buying mobile phone for older relatives as gifts³. In this context, the needs and/or interests of older people can give rise to potential requirements and subsequent demand for IST applications.

For our purposes “applications” are defined as uses to which ISTs are or could be put and in SeniorWatch the focus is mostly on communications applications, that is, on applications that involve doing things at a distance. This set of applications is very wide ranging but can be grouped into three main domains that relate, on the one hand, to needs and lifestyles, and on the other hand to possible market segments and to IST technologies and services. These three domains include (a) general-purpose applications, (b) care-related applications and (c) accessibility-related applications/ requirements.

³ Of course, there is a lot of reciprocity between the generations and the purchase of toys (now often based on or incorporating IST components) by older people for their grandchildren is already a significant segment of the toy market.

Figure 1 Generic model of the demand-supply space addressed by SeniorWatch



Source: © SeniorWatch, 2001

General-purpose applications are those that are likely to be of interest (or not of interest) to older people to more or less the same degree as any other age group. This category would include generic activities, carried out at a distance, such as interpersonal communication, shopping, getting information, working, learning and so on. Care-related applications are those that involve access to or delivery of care services, at a distance, such as social services, social alarm and monitoring services and health care. Accessibility-related applications and requirements are those that relate to needs resulting from functional changes due to disability and/or age, for example changes in vision, hearing, mobility and so on.

Another type of relevant demand is “institutional” demand. Here the focus shifts to demand for ISTs amongst the institutions that provide support services for older people, which can be provided in different contexts and by a range of organisations⁵. Within SeniorWatch, the focus is on organisations providing home care services, including social and health care services. The following are some of the main reasons for targeting this sector:

- Home care is the most prevalent form of care service delivery to older people in Europe. It is estimated that only about 5% of the European older population live in institutional settings⁶.
- The home care sector is growing in all European countries and most pursue a policy that explicitly promotes home care over institutional care⁷.
- Although there is a lack of robust empirical data about the forms of support that older people prefer, there are indications that most people prefer home care above institutional care. For instance, many older people increasingly see public home care services - when they become necessary - as a public right⁸. In view of demographic developments, the market potential for home care-related IST applications can thus be expected to grow considerably in the near future.

In the case of home care, services need to be delivered to dispersed geographic locations (i.e. the clients' homes) and IST can be of particular importance when geographic distances need to be overcome.

Factors that can stimulate demand for ISTs at the institutional level include the nature of the services that are being provided and the profile of the client base that is being served, as well as the organisational structure and its institutional context. Some services, such as meals on wheels, cannot be directly delivered through ISTs although the logistics of ordering and delivery can be supported by ISTs. Whereas other services, such as social alarm systems or health monitoring can be delivered via ISTs. The profile of the client base is also relevant, as this will determine the range of needs that have to be met as well as logistical requirements in relation to meeting these needs (e.g. geographical distribution of clients). Finally, characteristics of the organisation itself are also important, including logistical aspects (e.g. number of sites) and the nature and frequency of communications with other organisations.

The range of services that may be provided by home care organisations includes health/social care, home help, social support, transportation, shopping, housing and housing adaptation, meal delivery, alarms/security, information/advice services and support for carers. There is a lot of diversity in relation to the organisation and levels of provision of these various services across Europe and the range of organisations providing home care differs considerably across Europe with regard to legal status, organisational profile and the scope

⁴ Of course, there is a lot of reciprocity between the generations and the purchase of toys (now often based on or incorporating IST components) by older people for their grandchildren is already a significant segment of the toy market.

⁵ Acolet, J et al. (1999). Social Protection for Dependency in Old Age in the 15 EU Member States and Norway. Statistical and Institutional Annexes. Leuven: Katholieke Universiteit Leuven.

⁶ Alber, J. et al. (1999). Seniorenpolitik - Die soziale Lage älterer Menschen in Deutschland und Europa. Amsterdam.

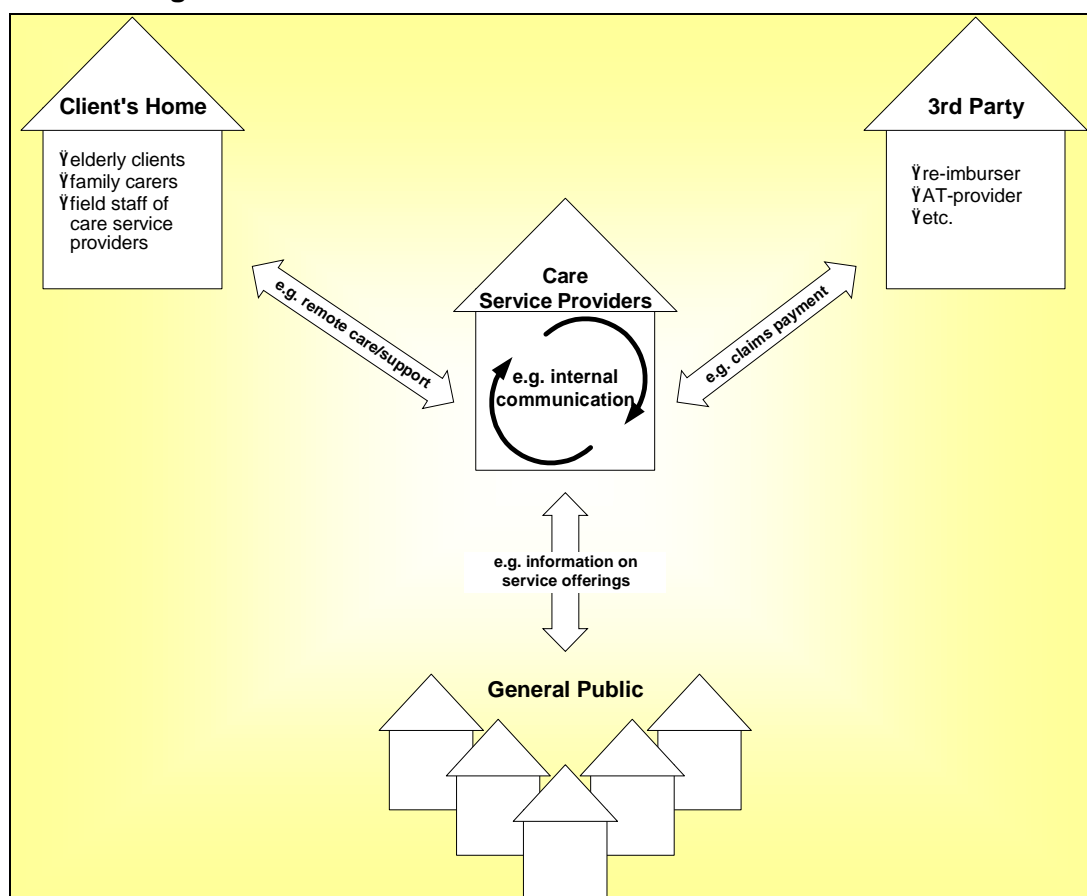
⁷ *ibid.* Some countries have even implemented a moratorium with regard to building new institutional homes for older people.

⁸ OECD (1994) Caring for the frail elderly, OECD Social Policy Studies No.14.

of service delivery⁹. Service providers may be public bodies, voluntary (non-profit) organisations and private (for-profit) organisations. In some countries, public bodies (e.g. municipalities) are the main providers of home care services, in others there is a growing market for private care services and in others the focus tends to be towards encouraging and supporting family/informal care. Figure 2 provides a schematic view of four main areas of potential demand that can be distinguished at the institutional level:

- Internal applications, e.g. to support administrative/logistical functions, including support for field staff
- Applications to support inter-organisational communication
- Applications to support interaction with clients and/or the public, such as information and booking services
- Applications that provide actual care services to clients.

Figure 2 Generic communication model for the care sector



Source: © SeniorWatch, 2001

⁹ See for instance:

Pacolet, J., et al. (1999). Social Protection for Dependency in Old Age in the 15 EU Member States and Norway. Statistical and Institutional Annexes. Leuven: Katholieke Universiteit Leuven.

Alber, J. et al. (1999). Seniorenpolitik - Die soziale Lage älterer Menschen in Deutschland und Europa. Amsterdam.

European Association of Care and Help at Home (EACHH) (1998). European Home and Community Care 1998/99. The Official EACHH Reference Book. London: Campden Publishing Limited.

In the case of applications that provide actual care services to clients (such as alarms or telecare) there is likely to be demand for ISTs at both the individual/residential and institutional levels. For example, clients will need equipment and connections in their homes and the service provider will require the necessary facilities at their end. Other care services may involve provision of equipment to clients (e.g. assistive technologies¹⁰) without any connection to the care service provider.

1.2 Supply side issues

On the supply side, the framework addresses both IST products and services themselves and the supply chains through which they reach older people and/or institutional markets.

In relation to ISTs, two overlapping categories of products and services - "mainstream" and "assistive" - are distinguished. Mainstream IST technology and services include the basic building blocks of telecommunications infrastructure and terminal equipment, as well as the services and content that are provided over these. Given the nature of the target markets being addressed in SeniorWatch, the extent to which these are designed to take account of the needs of older users is a central issue. Important features include:

- Accessibility (they should be designed-for-all, including older people who may have functional difficulties due to age or disability)
- Usability (designed to take into account cognitive changes associated with ageing)
- Aesthetics/image (designed to meet styles/fashions that are more or less appealing for different age groups or market segments).

Within SeniorWatch, the category of ISTs referred to as "assistive" is used broadly to include any IST-based equipment or service that helps to meet the care-related or accessibility-related needs of older people. The category therefore can include general-purpose technologies such as videophones that can be used in "assistive" ways, e.g. to provide social or health care or to enable deaf people to communicate by sign language or teleshopping services that are used by older people as a solution to mobility difficulties. It can also include a wide variety of specifically designed systems and services to deliver health/social care services to older people who need them or to provide accessibility solutions for older people with physical, sensory and other disabilities. Of course, accessibility features can (and should) be built into mainstream products and services, and conversely assistive products and services can include mainstream products and services used for other purposes as well as those products and services specifically designed as assistive.

In relation to assistive products/services for the home-based market, there is also a variety of players and ways of delivery involved. IST products and services do not necessarily reach older and disabled users directly or via their family carers. In other words, the decision whether or not IST products and services are going to be supplied to older people is not necessarily taken by the family carers or end users alone. For instance, care service providers are often the decision-makers regarding whether they incorporate the supply of IST products and services into their service processes. By adding a specific value to products and services available on the market, IST can become of particular interest to their clients (e.g. in the case of remote care schemes). Moreover, different kinds of financing arrangements (e.g. free or subsidised equipment or services) and/or distribution arrangements (e.g. assistive technology delivery systems) can influence the decision whether or not particular IST applications are supplied.

¹⁰ Assistive technology is the term used to refer to the wide variety of technology-based devices and systems that can help older people and disabled people overcome functional difficulties in everyday life arising as a result of age or disability.

1.3 Environmental features

The conceptual framework also identifies a variety of environmental features that can influence the demand and supply sides. Six main environmental features are identified, namely financial, policy, health and social care system, regulation, general IST situation, and RTD. These are described in further detail in the following paragraphs.

Financial environment

The extent to which older users must pay market prices for IST products or services is an important factor in the stimulation of both demand and supply. For example, assistive technology services may provide free equipment or at least some level of reimbursement of costs and social welfare systems and the telecoms industry (through universal service provisions) may subsidise connection and usage costs (e.g. for telephone services). The type of payment system for care services and what it covers will also be important. IST-based services that are free/reimbursed are likely to be more attractive to older people than those that have to be paid for out-of-pocket.

Policy environment

Policy areas of potential relevance for the stimulation of demand and supply include:

- Information society i.e., the extent to which Information Society policy and initiatives give attention to older people, innovation in health and social care, and so on
- Older people i.e., the extent to which policies towards older people give attention to ISTs or otherwise serve as drivers towards increased usage of ISTs, for example, in the promotion of access to lifelong learning or new ways of citizen interaction with administrative services
- Care services i.e., the extent to which policies towards care services that are of relevance to older people give explicit attention to ISTs or otherwise serve as drivers towards increased usage of ISTs, for example, through encouragement of online access to service information.

Health and social care systems

The mix of public services, private services and family in the provision of care for older people is another relevant factor. This may influence both the nature of demand (what IST products/services are of interest) and where the demand will come from (family members or institutions). Also important are the types of drivers of change that exist (e.g. cost-containment, improved quality of services, greater equity of access, and so on) and the extent to which these encourage or discourage the utilisation of ISTs.

Regulatory environment

Whether or not there are regulations, standards or guidelines in relation to the accessibility of IST products and services is also important, for example, requirements that public web sites are accessible. The extent to which the needs of older people and disabled people are addressed in universal service provisions for the telecommunications (and broadcasting) sectors can also stimulate both supply and demand.

General IST situation

The more general level of availability, take-up and usage of ISTs in society will also be important. The greater the level of penetration of the Information Society into everyday life, the more likely it will be that older people will want to participate and use ISTs.

RTD

Finally, the extent to which IST needs and interests of older people are being given RTD attention is also relevant, including publicly sponsored and industrial research and development activities. This can stimulate innovation and supply of useful products and services.

2 Recommendations

Based on the overall framework described above, the following aspects need to be considered when developing strategic recommendations.

Issues to be addressed

Firstly, any deficits that emerged from the previous strands of work (e.g. surveys, case studies, country reports, techwatch) need to be identified. Various issues will need to be considered in order to improve the current demand-supply match. For instance, the societal challenges that were identified in previous work tasks will need to be addressed such as improving access to IST among disadvantaged groups or coping with the developments that will arise with demographic changes (e.g. “care crisis”). Other deficits concern market opportunities, e.g. insufficient exploitation of market potentials by industry. That is, poor levels of usability of IST products already available is a major barrier to fully exploiting market opportunities. This is made obvious by the fact that half of the EU 50+ population surveyed stated that their needs/interests regarding appropriate design were not adequately considered by industry. Other technology-related challenges will also have to be considered, for example, if traditional services are increasingly replaced by online-services (telebanking, e-government, etc.) a wide variety of users will become more and more dependent on technology. Current technology, however, is not capable of catering for all the requirements of older users and new developments are needed in this regard.

Actors to be addressed

Secondly, stakeholders need to be identified that are capable of taking the necessary actions to overcome the deficits identified above. For our purposes, we can distinguish four generic categories of actors to be considered here, as follows:

- IST providers: including all types of players which offer IST devices and services on the market such as telecoms, online service providers, software/hardware industry, traders, assistive technology manufacturers, etc.
- policy makers: including national policy makers/bodies as well as policy makers/bodies at the EU level,
- ageing organisations: including older people's organisations, carer's organisations, occupational unions from the care sector, etc., and
- care service providers.

Recommended action

Based on the various strands of work undertaken in the project and the results and experiences gained from this work, concrete actions are now being recommended in order to overcome each of the particular deficits identified. A straightforward example concerns the issue of poor usability of current IST products where the careful incorporation of user requirement analysis into the design/development process would greatly improve the current situation.

The recommendations presented in the remainder of this document are organised at two levels. First, in section 2.1, some recommendations addressed directly towards current and future EU policy and action in relevant areas are presented. Then, as outlined above, the recommendations proposed in section 2.2 are presented according to the three IST domains

addressed in SeniorWatch, the issues to be addressed in each domain and the actors concerned with the recommended action.

2.1 Recommendations with direct relevance for EU policy/actions

The optimal take-up and utilisation of ISTs by older people and by care services in Europe is of considerable relevance for the achievement of important aspects of EU economic, social and health policy. The results of the SeniorWatch study clearly demonstrate that there is a high level of potential demand amongst older people and their families and amongst the organisations providing home care services for older people. However, there are a range of supply-side, demand-side and environmental factors impeding the conversion of this potential demand into actual demand, take-up and usage. As outlined later in this section, there are a number of ways that these impediments can be addressed in current and future actions at the European level. The demographic imperative posed by the rapid ageing of the European population means that these actions should be progressed as a matter of urgency.

The main high level recommendations from SeniorWatch are the following.

Benchmarking

- Monitor and benchmark on an on-going basis the utilisation of ISTs by older people and care services in Europe

Supply side measures

- Raise awareness in industry of the importance and characteristics of the market amongst older people
- Encourage industry to ensure that IST products and services are designed to be usable by older people
- Promote and support RTD in new products, services and applications
- Encourage the development of high quality assistive technology supply services in all member States
- Promote and support the appropriate incorporation of ISTs in care service delivery throughout Europe (this is also a demand side issue as care services can be both purchasers and suppliers of ISTs)

Demand side measures

- Promote awareness and skills in relation to IST amongst older people in Europe
- Promote awareness and skills in relation to ISTs amongst care services and care professionals in Europe
- Consider ways of reducing financial barriers to access to and usage of ISTs by older people.

In formulating more specific recommendations for EU-level actions, there are two aspects of the SeniorWatch results that need to be given particular attention. These are:

- The segmentation of the older population in relation to IST needs, interest, access and utilisation

- The analysis of the strengths and weaknesses of the current European situation (for details see D5.2), both in relation to its own internal market and social potential and in the context of global benchmarking and competitiveness.

Sub-sections 2.1.1 and 2.1.2 present recommendations for EU-level action organised according to these two aspects, respectively.

2.1.1 Targeting EU-level actions

In relation to the first point - the segmentation of the older population - it is clear that whilst the population of people aged 50 years and over in Europe is a very heterogeneous one, large sub-groups can be identified that share particular characteristics in relation to ISTs and consequently present indications for specific types of targeted action at the European level. Table 1 below gives an overview of some of the main groups, types of European-level action recommended and the programmes/action lines under which they could be implemented.

Table 1 Recommended EU-actions by target group

Type of segmentation	Sub-group	Type of action recommended	Implementation of action
IST orientation and access	Experienced front-runners (27 % of the EU 50+ population, i.e. some 32 million people)	<ul style="list-style-type: none"> • Valorise their experiences (role models, mentors...) 	Incorporate into awareness-raising, promotional and educational initiatives, such as: <ul style="list-style-type: none"> • IS promotion and awareness-raising initiatives
	Old age beginners (13% of the EU 50+ population, i.e. some 15 million people)	<ul style="list-style-type: none"> • Encourage development of skills 	<ul style="list-style-type: none"> • ECDL (encouraging take-up amongst older people)
	Technology open-minded (29% of the EU 50+ population, i.e. some 35 million people)	<ul style="list-style-type: none"> • Encourage interest and development of skills 	<ul style="list-style-type: none"> • EQUAL (awareness, access, skills) • Life-long learning and eLearning programmes
	Digitally challenged (31% of the EU 50+ population, i.e. some 38 million people)	<ul style="list-style-type: none"> • Encourage interest and development of skills 	
Labour-market relationship	Working age (49% of the current EU 50+ population, i.e. some 60 million people)	<ul style="list-style-type: none"> • Encourage and support workability and employability 	<ul style="list-style-type: none"> • Employment Guidelines • Public Health programme
	Post-retirement age (51% of the current EU 50+ population, i.e. some 62 million people)	<ul style="list-style-type: none"> • Encourage and support active ageing (participation and contribution) 	<ul style="list-style-type: none"> • Active ageing actions • Public Health programme

Table 1 Recommended EU-actions by target group (continuation)

Type of segmentation	Sub-group	Type of action recommended	Implementation of action
Care needs	Those needing/receiving self-care and/or family care (19% of the EU 50+ population have problems with activities of daily living, i.e. some 23 million people ¹¹ , from which only 5% receive care on a regular basis)	<ul style="list-style-type: none"> Encourage development, take-up and utilisation of IST-based solutions 	<ul style="list-style-type: none"> IS promotion and awareness-raising initiatives 6th Framework (RTD and Support actions) Public Health programme
	Providers of family care (16% of the EU 50+ population, i.e. some 19 million people)		
	Those needing/receiving care services (1 % of the EU 50+ population receives professional care, i.e. some 1 million)	<ul style="list-style-type: none"> Encourage development, take-up and utilisation of IST-based solutions 	<ul style="list-style-type: none"> IS promotion and awareness-raising initiatives 6th Framework (RTD and Support actions)
	Providers of care services		<ul style="list-style-type: none"> Public Health Programme
Accessibility needs	Those needing care-related Assistive Technology (AT)	<ul style="list-style-type: none"> Awareness of IST-based AT 	<ul style="list-style-type: none"> IS promotion and awareness-raising initiatives
	Providers of care-related Assistive Technology (AT)	<ul style="list-style-type: none"> Availability of IST-based solutions Encouragement of good practice Harmonisation of services 	<ul style="list-style-type: none"> 6th Framework (RTD and Support actions) Public Health Programme Modernisation of Social Protection systems Innovation/enterprise development programmes and supports
Accessibility needs	Design-for-All (64% of the EU 50+ population suffer from severe or slight restrictions in accessing ISTs, i.e. some 78 million people ¹²)	<ul style="list-style-type: none"> Raise awareness Provide incentives Regulate 	<ul style="list-style-type: none"> EEurope actions eContent programme Public procurement Anti-discrimination measures Universal service requirements (telecommunications and broadcasting) Corporate social responsibility actions IST standardisation actions

¹¹ According to our operationalisation, this figure includes those who stated that they have difficulties with going shopping or with having a bath/shower or with getting dressed/undressed

¹² According to our operationalisation, this figure includes those who have problems with hearing or seeing fine detail or using their finger when using ISTs, e.g., for manipulating a key board or using a touch screen.

Table 1 Recommended EU-actions by target group (continuation)

Type of segmentation	Sub-group	Type of action recommended	Implementation of action
Accessibility needs (continued)	Those needing accessibility-related Assistive Technology (AT)	<ul style="list-style-type: none"> Awareness of IST-based AT 	<ul style="list-style-type: none"> IS promotion and awareness-raising initiatives
	Providers of accessibility-related Assistive Technology (AT)	<ul style="list-style-type: none"> Availability of IST-based solutions Encouragement of good practice Harmonisation of services 	<ul style="list-style-type: none"> 6th Framework (RTD and Support actions) Public Health Programme Modernisation of Social Protection systems Innovation/enterprise development programmes and supports

2.1.2 Addressing Europe's strengths and weaknesses

Defining the specifics of the actions that need to be undertaken should also be informed by the results of the SeniorWatch SWOT analysis of the current situation in Europe performed within work task 5.2 (see D5.2). Table 2 outlines the recommendations from SeniorWatch that relate to the main conclusions of the SWOT analysis.

Table 2 Recommended EU-actions in relation to SWOT analysis

Euro-pean situation	Target areas	Recommended actions
Strengths	<ul style="list-style-type: none"> Significant RTD activity and accumulated skills and knowledge in care- and accessibility-related ISTs 	<ul style="list-style-type: none"> Stimulate and support exploitation and technology transfer through RTD programmes and innovation/enterprise support programmes
	<ul style="list-style-type: none"> Technology leadership in some technology markets (e.g. mobile) 	<ul style="list-style-type: none"> Encourage and support RTD and product/service development for the older market by European industry
	<ul style="list-style-type: none"> Some countries (e.g. Nordic) provide models of good practice in the provision/utilisation of ISTs for care and accessibility purposes 	<ul style="list-style-type: none"> Raise awareness across Europe and encourage all Member States to follow the good example
	<ul style="list-style-type: none"> Increasing political and policy attention to accessibility issues 	<ul style="list-style-type: none"> Promote industry awareness, interest and activity through demonstration of the business-case and regulatory actions where appropriate
	<ul style="list-style-type: none"> Generally well-developed telecommunications infrastructure 	<ul style="list-style-type: none"> Encourage service providers to develop and deliver general-purpose, care-related and accessible services for older subscribers

Table 2 Recommended EU-actions in relation to SWOT analysis (continued)

Euro- pean situation	Target areas	Recommended actions
Weak- nesses	<ul style="list-style-type: none"> Digital divides - North-South, and by demographic and socio-economic circumstances 	<ul style="list-style-type: none"> Target initiatives and resources towards countries, regions and groups lagging behind
	<ul style="list-style-type: none"> Relatively high costs and lack of public supports in some countries 	<ul style="list-style-type: none"> Encourage adoption of good practice and harmonisation, where appropriate, of financial support mechanisms under social protection, universal service and assistive technology delivery systems
	<ul style="list-style-type: none"> Lack of direct regulatory requirements on IST industry to provide accessible ISTs (in comparison to US) 	<ul style="list-style-type: none"> Consider the implementation of direct regulatory requirements within anti-discrimination, public procurement, and/or universal service frameworks
	<ul style="list-style-type: none"> Lack of attention to the older market by IST industry 	<ul style="list-style-type: none"> Provide market information and other supports to stimulate industry attention and activity
	<ul style="list-style-type: none"> Poor technology transfer and exploitation of results of RTD in the area 	<ul style="list-style-type: none"> Encourage and provide supports for exploitation and technology transfer under RTD and enterprise/innovation programmes
	<ul style="list-style-type: none"> Underdeveloped assistive technology services in many countries 	<ul style="list-style-type: none"> Encourage adoption of good practice and harmonisation, where appropriate, of assistive technology delivery systems
	<ul style="list-style-type: none"> Oligopolistic structures in assistive technology supply 	<ul style="list-style-type: none"> Develop measures to open up the Member State markets for assistive technology supply and make them more efficient and competitive
	<ul style="list-style-type: none"> Diversity of health and social care systems and players 	<ul style="list-style-type: none"> Provide information and supports to encourage industry to enter the health and social care markets of other Member States
	<ul style="list-style-type: none"> Challenges posed by linguistic and cultural diversity amongst Europe's older population. 	<ul style="list-style-type: none"> Provide supports to encourage the provision of all key online information services in all European languages
Opportuni- ties	<ul style="list-style-type: none"> Exploitation of IST to meet labour market and care challenges of ageing population 	<ul style="list-style-type: none"> Support research, RTD and technology utilisation to improve workability/employability of older people and cost-effective care for those that need it.
	<ul style="list-style-type: none"> Development of well-functioning internal market and global leadership in care- and accessibility-related IST products and services 	<ul style="list-style-type: none"> Promote and support RTD, technology transfer, internal market openness and global market penetration for European industry in care-related and accessibility-related products and services
Threats	<ul style="list-style-type: none"> Potential US dominance in IST market amongst older people 	<ul style="list-style-type: none"> Mobilise and support European industry to become competitive in the European and global markets

2.2 Recommendations by type of IST, issue and relevant actors

To facilitate selective reading, the following Table 3 presents a summary overview of each of the individual recommendations with the corresponding details of each recommendation discussed in the following sub-sections.

Table 3 Overview of recommendations by actor

Recommendations by actor		Industry	Policy	Aging organisations	Care providers
General purpose IST	<p>Issue I: Market potentials are not yet adequately addressed</p> <ol style="list-style-type: none"> 1. Gain competitive advantages from developing products and services for the widest possible range of users 2. Target older customers through dedicated marketing strategies 3. Cater for those who do not understand “cyber jargon” 	<ul style="list-style-type: none"> • • • 			
General purpose IST	<p>Issue II: The design-for-all philosophy has not yet received enough recognition among IST manufacturers and service providers</p> <ol style="list-style-type: none"> 4. Take advantage of guidelines, product development methodologies and tools available for supporting the design process of accessible mainstream IST 5. Apply a comprehensive approach when assessing cost – effectiveness of the design-for-all approach with regard to a particular product line 6. Direct resources towards the generation of information and tools required by industry to adopt the design-for-all philosophy 7. Promote the implementation of a comprehensive public procurement strategy relating to accessible IST products and services 8. Pressure IST manufacturers and service providers to recognise the market potential for IST-based products that meet the needs and requirements of older users 	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> • • • 	<ul style="list-style-type: none"> • • 	
General purpose IST	<p>Issue III: A lack of skills hinders older people to fully exploit ISTs for their purposes</p> <ol style="list-style-type: none"> 9. Consider IST training for older people as a business activity which can add millions of seniors to the pool of e-business customers and not only as a social contribution 	<ul style="list-style-type: none"> • 			

Table 3 Overview of recommendations by actor (continued)

Recommendations by actor		Indus- try	Policy	Aging organi- sa- tions	Care pro- viders
General purpose IST	<p>Issue IV: The “digitally challenged” are at risk of being left behind</p> <p>10. Promote “e-inclusion” as a distinct target within national Information Society policies</p> <p>11. Promote “e-inclusion” as a distinct target within national Information Society social and welfare policies</p> <p>12. Explore diverse options for enabling the “digitally challenged” to learn about the benefits ISTs may hold for them</p> <p>13. Monitor participation of older people in the Information Society and related social impacts</p> <p>14. Ageing organisations should give ISTs higher priority on their agenda</p>		<ul style="list-style-type: none"> • • • • 	<ul style="list-style-type: none"> • • • • 	
General purpose IST	<p>Issue V: Non-affordability hampers IST uptake among lower income groups</p> <p>15. Encourage affordability of IST services and devices by specifying the provision for financial accessibility of basic services that should be included within universal service obligation</p> <p>16. Include telecommunications costs within social protection and income policy</p>		<ul style="list-style-type: none"> • • 		
Care-related IST	<p>Issue VI: Despite considerable potential demand, the actual market for care-related applications is still in its infancy</p> <p>17. Explore market opportunities for demand-driven e-health and telecare applications of practical relevance</p> <p>18. Consider IST as an empowering tool for family carers when developing care-related policy</p> <p>19. Promote financial provision for IST-based solutions within home care delivery schemes</p> <p>20. Beware the danger of a “medical divide”</p>	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • • • • 		<ul style="list-style-type: none"> • •
Care-related IST	<p>Issue VII: Structural problems internal to the home care sector hamper broader uptake of IST-based care solutions</p> <p>21. Pursue an integrative approach when developing IST-based solutions for the care sector</p> <p>22. Encourage experimentation with IST applications within day-to-day care practice</p> <p>23. Recognise IST as a strategic issue for your business</p>	<ul style="list-style-type: none"> • • 	<ul style="list-style-type: none"> • 		<ul style="list-style-type: none"> • •

Table 3 Overview of recommendations by actor (continued)

Recommendations by actor		Indus-try	Policy	Aging organi-sations	Care pro-viders
Accessibil-ity-related IST	<p>Issue VIII: Mainstream services – even if de-signed in accordance with the “design for-all” philosophy - are not capable of catering for all functionally restricted</p> <p>24. Accept and encourage technical standards facilitating access to ISTs for people with functional restrictions</p> <p>25. Explore opportunities for providing more services for functionally restricted and/or vulnerable people</p> <p>26. Promote the implementation of a comprehensive anti-discrimination legislation</p> <p>27. Put accessibility of the emerging Information Society as an explicit topic on the national policy agenda</p>	<p>●</p> <p>●</p>	<p>●</p> <p>●</p> <p>●</p> <p>●</p>	<p>●</p>	<p>●</p>
Accessibil-ity-related IST	<p>Issue IX: Structural characteristics of the assis-tive technology (AT) sector hamper up-take of innovative IST solutions for older people with functional restrictions</p> <p>28. Promote structural changes and harmonisation of cur-rent national AT delivery schemes</p> <p>29. Promote needs-oriented financial support for purchas-ing/maintaining IST equipment within AT provision schemes</p> <p>30. Explore options for more effective exploitation of publicly funded RTD within the AT sector</p>		<p>●</p> <p>●</p> <p>●</p>		
Cross sectoral	<p>Issue X: The lack of integration of national and EU RTD/policy strategies hampers broader implementation of IST solu-tions for older people and their carers</p> <p>31. Encourage EU-wide consensus building and better co-ordination of national and EU strategies to accelerate IST uptake among older people and their carers</p>		<p>●</p>		
Cross sectoral	<p>Issue XI: Further research is required to under-stand how emerging IST-based envi-ronments can be made accessible for all citizens including those who have particular user requirements</p> <p>32. Reactive RTD strategies aiming at ensuring access ability of ISTs should be replaced by proactive strategies</p> <p>33. Direct RTD effort towards the investigation of non-pathological age-related user requirements</p>	<p>●</p> <p>●</p>	<p>●</p> <p>●</p>		

2.2.1 General purpose IST

2.2.1.1 Issue I: Market potentials are not yet adequately addressed

Older Europeans currently do not utilise IST services and devices to the same extent as younger age groups do. However, the SeniorWatch data show that this population group represents a market segment that - if adequately addressed - offers tremendous market opportunities for the telecommunications industry, equipment manufacturers and service providers. About two thirds of the European current 50+ population is generally open-minded towards IST (over 80 million people), and the EU-wide market for computers, the Internet and mobile phones is expected to grow by 10 to 13 million new customers respectively from 2001 to 2003. The Internet market within the 50+ age group is heading for a 60% growth rate and even more people now show an interest in activities that can be done online, although they may not be interested in the Internet as such. Overall, 61% of the 50+ population in the EU either use the Internet already or are at least interested in certain online applications. Together this data represents 74 million potential customers for online services.

However many older Europeans have function restrictions, which are most commonly associated with vision, hearing, and/or use of their fingers. Overall, 25 million (21%) 50+ are severely restricted in this regard while another 50 million (43%) suffer from slight restrictions, and this is not restricted only to the older age cohorts. The prevalence of functional restrictions among older Europeans in all age groups requires ubiquitous design-for-all solutions if this market segment is to be adequately addressed. However, more than half of the current 50+ population in the EU do not see their interests adequately reflected in the designs considered by IST manufacturers and more than 70% say that the media only target younger people when it comes to such technology.

Industry Gain competitive advantages from developing products and services for the widest possible range of users

Due to recent technology trends and market developments, the concept of the "average user" as a synonym for agile younger adults can – sooner or later - be expected to lose its dominance within the IST sector. As IST intelligence becomes increasingly integrated into all kinds of networked devices used in the day-to-day environment (e.g. home/leisure/business/care environments, traffic environments/cars, different types of mobile devices to be used while on the move), usage contexts will increasingly diversify (e.g. utilising the Internet while shopping in the street, driving a car or working in a mobile context). IST applications will, therefore, be increasingly required to be capable of adjusting to a variety of usage contexts and user capabilities. Furthermore, more and more IST markets are approaching the saturation level, e.g. the mobile telephony market, and this trend is very likely to urge IST manufacturers and service providers to target new customer segments.

Against this background, the so called design-for-all paradigm¹³ has much to offer, as it explicitly suggests that a user population should be viewed in terms of a wide spectrum of needs, expectations and abilities. It employs proactive approaches, measures and tools in order to develop user interfaces for mainstream IST products and services which ensure universal access and quality in use to the widest possible range of users, thus avoiding the need for a later adaptations or specialised design. The rationale behind this approach is not grounded upon designing for the mythical "typical" or "average" user, unlike

¹³ See: <http://www.stakes.fi/include/incd420.html> (accessed April 14, 2002)

current "conventional" IST product design leading to user interfaces for products that do not cater for the needs of the broadest possible population. Conventional design excludes many categories of users including non-expert IST users, the very young, the elderly and people with disabilities.

Recently, there has been some activity - both outside and inside the European Union - to promote the design-for-all approach and to develop respective design methods and tools. The EU has for instance been funding several activities in this regard under its RTD programmes and examples demonstrate how the design-for-all concept can be successfully implemented within business environments. Some IST manufacturers have now begun to systematically investigate age/disability related user requirements to be considered when designing new IST products. For instance, in 1998 an "accessibility group" was implemented within Nokia, USA and accessibility is now adopted as one of the company's standard product requirements. The group's mission is to establish Nokia as the leader in accessibility solutions. People with functional restrictions are seen as a powerful consumer market that the highly competitive telecommunications industry can no longer afford to ignore.

Taking an inclusive approach on services and devices offered in the IST sector - as in the case of Nokia - should be within the self-interest of the telecommunications services industry, of equipment providers and of information service providers as their products would become acceptable to a greater range of consumers. Such an approach may however also open up opportunities to develop market niches, e.g. by offering easy to use mainstream devices and interfaces meeting the particular user requirements older (potential) customers may have. This may, for instance, include alternatives for key boards, mouse or tools for adaptation of web sites which make them suitable for seniors with moderate disabilities. In many cases, so called "accessibility features" designed for particular functionally restricted user groups may well turn out to have benefits for the mass market also. A good example of this are mobile telephones with a vibrating battery to alert the user to incoming calls designed to help the hearing impaired. Also, senior-friendly pervasive devices, such as non-PC computing/on-line devices with easier interfaces are presumably targeted at the older population could also be used by much younger customer segments. In most cases, products and services that are easy to use for seniors will also become easy to use for everyone.

Industry

Target older customers through dedicated marketing strategies

As already mentioned, more than 70% of the EU 50+ population perceive IST in the media to be targeted only at younger people and more than half do not feel adequately considered by IST manufacturers. Older people will be less motivated to develop any interest in concrete IST products and services unless they believe that the products and services available on the market really meet their needs and preferences. Therefore, marketing strategies pursued by industry need to consider older consumers as a distinct target group in order to raise awareness about the relevance that individual products and services may have for them.

For instance, our data indicate that older people appear to be interested in applications, i.e. things that can be done with the help of IST, rather than in the technology itself, e.g. the Internet. A more useful marketing approach, therefore would be to highlight the benefits that older customers may gain

from certain IST products and services instead of “selling the technology”. For example, in the SeniorWatch survey data older mobile telephony users tended to appreciate their mobile phones as a security device rather than as a tool for extensive social communication. The capabilities of mobile phones to enhance security in outdoor environments, e.g. to call for help while having a walk, should be more visible to potential customers rather than highlighting a trendy design or a new smaller size as the main selling argument. Another example would be email as a means of very quick and cheap long distance communication compared with using the telephone or snail mail. Already today, many older people maintain long distance contacts with relatives and are particularly interested in using email for this purpose. As seniors increasingly live in one-person households, electronic communication will become even more important for them as a means of staying involved in social networks. According to our data, nearly one quarter of the EU 50+ population lives alone today and another 40% live only with a spouse in the same household. This situation is particularly fostered by the trend towards occupational migration of children and increasing retirement migration by older people themselves. In addition, the low levels of employment of older people in most countries tend to reduce opportunities for face-to-face contacts, which increases the importance of remote interpersonal communications for this group.

Industry Cater for those who do not understand “cyber jargon”

As revealed by the SeniorWatch user surveys, older people have a diverse range of interests and are interested in many of the same on-line services as other age groups. Moreover, some services may be of particular interest to them such as information on health issues, pensions and retirement. However, older age cohorts are less likely to speak a foreign language and are therefore more likely to find the current dominance of the English language and “cyber jargon” in the on-line world rather off-putting. Both availability of content and utilisation of technical terms in national language is therefore crucial for making the online world more attractive to older Europeans. This does not however only apply to the Internet, but also to other interactive IST applications such as digital TV and information kiosks.

2.2.1.2 Issue II: The design-for-all philosophy has not yet received enough recognition among IST manufacturers and service providers

Despite an increasing awareness of the design-for-all concept within the research community, there remains a lack of accessible products reaching the market and most of today’s IST products and services still target the “average user”. This may be partly due to the widely spread misconception of the meaning of terms such as “design-for-all” or “inclusive design”. In many cases, decision makers as well as product developers may simply feel overstrained by the supposed requirement to design products/services that are accessible for all types of functionally restricted people no matter the severity or combination of their disabilities. Rather, the design-for-all approach promotes reaching the widest possible range of people commercially and practically while still working within the limits posed by the product in ques-

tion and by current technologies. Recent definitions¹⁴ of the design-for-all concept include for instance a three level approach: (1) *inclusive design*, i.e. to cater for the broadest possible range of user needs/requirements when developing a particular device/service, (2) *adaptable interfaces*, i.e. to provide adaptations where the device as such cannot cater for any particular user requirements and (3) *special solutions*, i.e. to provide assistive technology (AT) as a special solution for a particular accessibility problem certain user groups may face. Indeed, there will always be people with some combination and/or severity of functional restrictions which will not be able to use mainstream products even if they were designed in accordance with the designed-for-all philosophy. Generally speaking “there are no fixed answers in inclusive design of ICT products, for the pace of change is too great. There are some fixed principles, the main one being the enlargement of the target market group. In order to be successful, manufacturers need to understand their markets (...). Inclusion is fundamentally a matter of applying that understanding to an increasingly wider section of the public, so that recognition and meeting that additional market demand becomes an automatic part of the design process.”¹⁵

Industry Take advantage of guidelines, product development methodologies and tools available for supporting the design process of accessible mainstream ISTs

The objective to develop accessible IST devices and services calls for information about the IST-related abilities and the expectations of those who are supposed to ultimately use the products to be developed. There is currently no single source of information on accessibility issues relating specifically to older people. However, there are a range of information sources that could be exploited for the purpose of designing accessible IST products and services for this population group.

For instance, the EU has funded several projects over the last decade under its RTD programmes which provide a useful source of information regarding inclusive design issues. A “quick test” is available at the home page of the INCLUDE project¹⁶ for checking how accessible the design of a given product is and the DASDA project¹⁷ provides detailed information about market potentials of IST products that cater for the needs of individual disability groups, e.g. if you do not consider the requirements of user group “x” you will lose “xx”% of the potential market. Guidelines about inclusive design of specific IST applications are again available from the web site of the INCLUDE initiative¹⁸. These concern a range of different applications and devices such as information kiosks, smart cards, GSM devices and screen phones. Apart from this, other accessibility related topics are examined including how to study user needs in order to identify user requirements. With regard to particular functional restrictions, disability organisations such as Royal National Institute of the Blind¹⁹ in the UK offer a wealth of information related to accessibility issues. Useful information is also available from sources in the USA, e.g., a

¹⁴ See: Hannele Hyppönen, Chris Law, Gregg Vanderheiden: Industry Awareness and Transfer in Europe and the USA. In: Bridging the Gap ? Access to telecommunications for all people. Edited by Patric Roe. Published by the Commission of the European Communities, COST219bis, 2001. pp. 95-117.

¹⁵ Tony Shipley, John Gill: Call Barred? Inclusive Design of Wireless Systems, published by the Royal National Institute of the Blind on behalf of PhoneAbility in collaboration with COST 219bis, London, 2000, p. 16. (also available at <http://www.tiresias.org/phoneability/wireless.htm>).

¹⁶ See www.stakes.fi/include/inca031.htm.

¹⁷ See <http://www.dasda.org/>

¹⁸ See <http://www.stakes.fi/include/incd450.html>.

¹⁹ See <http://www.rnib.org.uk/>

series of reference designs for cross-disability accessible cell phones is available from the TRACE centre²⁰.

As regards software and user interfaces in particular, various guidelines have emerged recently that can be applied to many different demographic groups. For older users, the most important guidelines relate to designs that accommodate impairments in vision, hearing, motor skills and working memory²¹. For instance, the World Wide Web Consortium's Web Accessibility Initiative provides a set of guidelines for web page designers to accommodate a variety of disabilities and impairments²² and an even more extensive set of recommendations is provided by Hawthorn²³. Coyne and Nielsen²⁴ have developed 75 design guidelines for making websites and intranets easier to use for people with functional restrictions on the basis of usability tests they have conducted in the USA and Japan. Their usability guidelines are an addition to existing technical guidelines, which ensure that websites offer users with disabilities basic access. Technical accessibility is seen as crucial, and it is strongly recommended that websites follow the official HTML standards for proper encoding of Web pages. However, technical accessibility on its own is not sufficient to make a website easy to use for people with functional restrictions. Disabled users may very easily get lost on a site even if they can access every individual page. It is also very easy to get fatigued and slowed down by overly long pages that do not allow quick access to key information. Their study revealed that current Web designs are three times easier to use for non-disabled users than for users with disabilities. Nevertheless, many of the guidelines proposed by the authors would actually make the designs easier to use for everybody.

Also, useful research has been conducted during recent years on how to systematically incorporate the users' perspective into the product development process. Here, the user-centred-design (UCD) approach provides a highly structured, comprehensive product development methodology driven by: (1) clearly specified task-oriented business objectives, and (2) recognition of user needs, limitations and preferences. Information collected using UCD analysis is scientifically applied in the design, testing, and implementation of products and services. When rigorously applied, a UCD approach meets both user needs and business objectives.

In addition, various kinds of simulation tools have been developed during recent years in order to reproduce certain infirmities of old age. For instance, the so called "Senior Simulator"²⁵ is a kind of a suit with a collection of accessories each designed to reproduce one of the infirmities of old age. Plastic and velcro splints stiffen the ankles, knees and elbows. The pockets of the jacket contain weights that drag down the shoulders and back. Plugs in the

²⁰ See <http://trace.wisc.edu/docs/phones/>.

²¹ See Hilary Browne: Accessibility and Usability of Information Technology by the Elderly, Department of Computer Science University of Maryland, College Park, MD 20742 USA, April 19, 2000 (available at <http://www.otal.umd.edu/UUGuide/hbrowne/>, accessed on February 06, 2002).

²² World Wide Web Consortium. Web Content Accessibility Guidelines 1.0. May, 1999. Available from the World Wide Web: <http://www.w3.org/TR/WAI-WEBCONTENT/>.

²³ Hawthorn, D. "Possible implications of aging for interface designers." *Interacting with Computers* 12(5), April 2000, pp 507-528. See also Jan Engelen, Filip Evenepoel: *Producing Web Pages that Everyone can Access*, A COST 219bis guide book, 1999. An electronic version of this document can be found at: www.stakes.fi/cost219/webdesign

²⁴ Kara Pernice, Jakob Nielsen: *Beyond ALT text: Making the Web Easy to Use for Users with Disabilities – Design Guidelines for Websites and Intranets Based on Usability Studies with People using Assitive Technology*, Nielsen Norman Group, Fremont CA, 2001. (available at www.Nngroup.com/reports/accessibility)

²⁵ See <http://www.globalideasbank.org/BOV/BV-585.HTML>.

ears, and goggles dim and narrow the vision. There are three sets of gloves - skin-tight latex, then thick cotton to dull the touch, and elastic to give the effect of arthritis in the fingers. However, less expensive tools may well suffice when assessing and designing user interfaces for seniors, e.g., a seniors-viewpoint simulator replicating how people with particular age-related functional restrictions see a display by converting colours and brightness.

Industry Apply a comprehensive approach when assessing cost-efficiency of the design-for-all concept with regard to a particular product line

It is frequently believed that developing and manufacturing products that cater for the needs of people with varying abilities is more expensive than traditional designs targeting the “average user”²⁶. However, a comprehensive cost-benefit assessment with regard to the implementation of inclusive design approaches within the product development process may reveal a different result. There are many examples where application of a design-for-all philosophy with the help of usability engineering methods has been cost efficient and produced measurable cost savings²⁷. In this context, the focus should not be exclusively on time-to-market as a measure of productivity. By meeting the needs of a larger group of users product acceptance can be increased, and this in turn may reduce the time needed to become cost-effective. Also, it is important to consider that functional restrictions in using IST do not only vary because of a person’s health or a given disability but vary by particular tasks and circumstance of use. As usage contexts diversify, adaptability of applications according to diverse user requirements will increasingly concern non-disabled users. For instance a person who wants to access the Internet while driving a car can be regarded as being ‘situationally’ and dexterity impaired due to the inability to use a key board while steering the car. In this sense, IST products/services can be expected to be increasingly used without relying on particular functions. Thus, specific user requirements which used to be assigned to disabled persons exclusively may also become important in the context of mass markets. Against this background, any know-how gained by addressing the specific needs and requirements of disabled users may well pay off in other markets also.

Policy Direct resources towards the generation of information and tools required by industry to adopt the design-for-all philosophy.

Ageing organisations As revealed by the SeniorWatch country reports, the introduction of legislation in the USA had a major impact on the IST industry’s awareness of accessibility related issues and anti-discrimination legislation has now emerged on the European policy agenda – at least in some Member States. However, experiences from the USA also show the need for academic, governmental and other groups to contribute to this discussion in order to help industry build accessible IST products to provide not just regulations, standards and guidelines but also tools and supportive knowledge for designers to understand

²⁶ See: Hannele Hyppönen, Chris Law, Gregg Vanderheiden: Industry Awareness and Transfer in Europe and the USA. In: Bridging the Gap ? Access to telecommunications for all people. Edited by Patrick Roe. Published by the Commission of the European Communities, COST219bis, 2001. pp. 95-117.

²⁷ See: www.stakes.fi/include/incb240.html

accessibility and to apply respective design techniques quickly and effectively²⁸. For instance in the USA, a set of cross-disability access techniques²⁹ that can be applied to standard electronic products have been made available to manufacturers to apply to their products to enhance the way they currently work, and to provide reference designs for particular products already mentioned in this report.

Ensuring accessibility of IST products and services is not a trivial issue. In particular, the convergence of telecommunications, computing and broadcasting technologies presents a number of challenges for ensuring that IST based systems are accessible to the widest possible range of potential users. Shipley and Gill have for instance analysed the enormous diversity of the design process with regard to the mobile arena³⁰. They have come to the conclusion that "(...) we contemplate a global network of terrestrial and satellite base stations carrying a myriad of services that will be accessed by a widely diverse range of terminals. It is difficult to know who to influence, and when. The best approach perhaps is to spread the message of inclusivity as widely as possible, so that it reaches all levels of the political, commercial, technological and aesthetic sectors that bear upon telecommunications."³¹ Finally, they recommend the following concrete measures:

- *Promotion of a culture of inclusion that will emphasise awareness of the inclusion philosophy throughout the telecommunications industries*

It is argued that achieving inclusivity in the design of a product or service may be compared with achieving consistent quality. It cannot be applied - like a coat of paint- at a single stage in the manufacturing process because it requires attention and awareness at every point, otherwise, some inadvertent lapse of attention might partially negate the objective. A component change, a different peripheral, the wrong packaging or even poorly presented instruction manuals can detract from a successful concept. The manufacturing organisation needs a culture of inclusivity just as it needs a culture of quality. That means that systems have to be in place to monitor and maintain the desired outcomes and these need to extend through the marketing, sales and service departments of the business.

- *Extending the database for designers on consumers and their requirements so that many more disabled and elderly people can be catered for in mainstream design*

The authors argue that design information related to disabilities is currently incomplete and scattered over a wide range of specialist databases; it needs to be assembled coherently and updated. Reviews of Standards and Guidelines need to encourage a pro-active approach and avoid repetition of short-term solutions. It is further recommended to aid the application of the inclusion philosophy by conducting studies of the user profiles of elderly and disabled people who are currently excluded.

²⁸ See: Hannele Hyppönen, Chris Law, Gregg Vanderheiden: Industry Awareness and Transfer in Europe and the USA. In: Bridging the Gap ? Access to telecommunications for all people. Edited by Patrick Roe. Published by the Commission of the European Communities, COST219bis, 2001. pp. 95-117.

²⁹ See <http://trace.wisc.edu/world/ez>

³⁰ See Tony Shipley, John Gill: Call Barred? Inclusive Design of Wireless Systems, published by the Royal National Institute of the Blind on behalf of PhoneAbility in collaboration with COST 219bis, London, 2000, p. 16. (also available at <http://www.tiresias.org/phoneability/wireless.htm>).

³¹ *ibid.* p. 23.

- *Establishing a forum where Inclusion and Accessibility issues can be freely and frankly explored with representatives of the telecommunications industries*

According to the authors, the primary object of establishing such a forum would be to facilitate discussion of accessibility issues openly and bluntly without compromising commercial confidentiality. It should avoid being a host to campaigning lobbies, for the other parties will then either retreat to prepared positions or fail to attend at all. The forum should be separate from platforms where industry and regulators conduct their more confrontational dialogues. It should perhaps combine the freedom of discussion enjoyed within professional bodies with the common interest approach of Government departments acting as industry sponsors. It must recognise that the consumers are crucial stakeholders and listen to their views. It will prove immensely valuable even if it only collates and prioritises the accessibility issues that industry should take note of. Above all, it needs to be flexible enough to take up issues quickly, as soon as they are perceived, and bring them to general notice. It does not need to develop solutions as that is best left to the industry but it does need to alert industry to real and potential problems of accessibility.

- *Facilitating consumer awareness of the possibilities and potential of ICT developments, in order to encourage informed choice and demand*

In parallel with these elements, the authors consider it as an on-going task of educating consumers so that they are encouraged and enabled to exercise informed choices and provide constructive criticism of the products they are offered, and to complain forcibly when products or services fall short of reasonable expectations.

Policy

Promote the implementation of a comprehensive public procurement strategy relating to accessible IST products and services

The public sector is a major purchaser of ICT equipment and services and can exert significant influence on industry through its purchasing power and policy. Some years ago, the US government put regulations into force that required government agencies to rely on low-current PCs only when purchasing new IT equipment. As a reaction, the PC industry quickly created a label for low-current products, the so called “energy star”, which were hence offered to consumers on a wider scale.

The 106th Congress established a new Subcommittee on Technology and Procurement Policy. The subcommittee is responsible for conducting a thorough examination of Federal IT management, including a review of state and local models, to improve the acquisition process. Since then, other than selected problem acquisitions, there has not been extensive focus on the IT acquisition process from an overall life cycle management standpoint. For example, the regulations implemented by the US General Service Administration ensure that government agencies only buy fax machines, photocopiers, mobile phones, PCs and software that are friendly to disabled employees.

As regards procurement regulations or directives requiring that equipment and services meet particular accessibility criteria for disabled people, the current situation across European Member States can be divided into two main

clusters; one cluster of countries (AUS, B, FIN, NL, P & UK) without any procurement guidelines and the other cluster of countries (F, D, IRL, I & E) with some explicit policy or laws outlining accessibility criteria for public procurement.

Ageing organisations

Pressure industry to recognise the market potential for IST-based products and services that meet the needs and requirements of older people

Many manufacturers have not yet recognised the market demands that exist for accessible products. Consumer organisations have an important role to play in making these market demands visible to industry. As demonstrated by the American Association of Retired Persons (AARP) in the USA, ageing organisations can play an important role in gaining industry's attention with regard to the particular needs and preferences of older consumers. On its home page³² the AARP publishes, e.g., research results and information on older people's preferences regarding IST products and services. Through articulating the consumer power of its members, the organisation gives older people a strong voice, which cannot be ignored by market players and the policy makers.

In this sense, aging organisations should use the collective purchasing power of their members to influence the market. For example, they could influence the shape of the market by bargaining for volume discounts or for the development of particular product lines, as well as merely increasing the size of the demand. However, individual user organisations vary a lot across the European Union in terms of the coverage of their operations and the level of technological sophistication available to them. Some organisations in some countries are very much state-of-the-art and indeed are often a major force in both technical innovation and policy formulation. Other organisations have more limited expertise and resources. Likewise, some organisations have a European and international perspective whereas others focus primarily on the particular circumstances of their local membership. In this situation, it appears useful to work together in order undertake joint representations to policy makers and to equipment and service providers. This co-operation should occur at both national and EU levels. Collective action can often have greater a impact than separate representations from several small groups.

Also, such a collaboration and pooling of available information on age-related IST issues could be useful with regard to educating consumers as proposed by Shipley and Gill³³. That is, to encourage and enable older people to exercise informed choices; to come forward with constructive criticism of the products they are offered; and to complain forcibly when products or services fall short of reasonable expectations

³² <http://www.aarp.org>

³³ Tony Shipley, John Gill: Call Barred? Inclusive Design of Wireless Systems, published by the Royal National Institute of the Blind on behalf of PhoneAbility in collaboration with COST 219bis, London, 2000, p. 16. (also available at <http://www.tiresias.org/phoneability/wireless.htm>).

2.2.1.3 Issue III: A lack of skills hinders older people to fully exploit ISTs for their purposes

Many older people – despite their general interest in IST – lack the necessary skills to utilise IST products and services, which they may principally be interested in. For instance, only 40% of those 50+ who have hands-on experience with a computer state they possess advanced computing skills, 50% possess very basic skills, and 10% say that they ‘virtually do not have a clue’.

Industry Consider IST training for older people as a business activity which can add millions of seniors to the pool of e-business customers and not only as a social contribution.

Training initiatives specifically targeting older people have been conducted in the USA but also in some European Member States during recent years by both voluntary organisations and private companies. Millions of seniors have, for instance, received training through initiatives such as SeniorNet, Seniors-Online-SOL and the “Senior-Info-Mobil”. This illustrates the huge demand for appropriate training measures among older people. Apart from this, a wealth of useful experience has been gained through these activities which should be utilised when considering options to raise the level of IST skills among actual and potential customers. These may for instance include:

- *Developing adequate tutorials and learning materials in cooperation with senior organisations active in this field in order to utilise their experiences*

Experiences in this area suggest that older people prefer smaller classes and special tutorials designed for them. In particular, it is extremely important to allow learning by doing at an individual pace. Further, it proved useful to translate any English terms into national language and to explain basic concepts (e.g. what is the internet all about) with help of metaphors borrowed from everyday life.

- *Developing programmes to involve retirees possessing required IST skills who can contribute in various regards, e.g., as teachers, trainers for trainers or for technical support (e.g. hardware, software).*

According to the experiences gained from existing training initiatives, models where seniors train seniors were highly successful. In this sense, the experience and IST skills some older people possess should be viewed as a very valuable asset.

- *Getting involved in existing (or creating new) non-profit groups as a platform for organising and advertising training programmes, obtaining funding, space and equipment, and acting as a governmental lobby*

Some ageing organisations have begun to promote IST training for older people and some have developed their own training programmes. Public-private partnerships in this area can offer benefits for both the non-profit organisations as well as the companies involved as they offer a cost effective way to utilise existing knowledge and capabilities available from both parties. For businesses, it can also be an effective way to make their contributions visible to both the target group in question as well as to the wider public

2.2.1.4 Issue IV: The “digitally challenged” are at risk of being left behind

About one third of the EU 50+ population (nearly 40 million people) is not at all interested in utilising IST for their purposes. A more detailed analysis of our survey data revealed that the likelihood that older Europeans will become involved in IST is directly related to the commonly identified factors associated with those included in the digital divide, i.e. these factors include socio-economic stratification such as gender, education, occupational background and derived from these is socio-economic status. In other words it is not just a matter of age as to whether older people want or are able to get involved in IST. Rather it is a matter of an overall “social divide”. Since the use of digital technologies will continue to play a key role in the future information society there is however a danger of mutual reinforcement. People from disadvantaged social groups who cannot afford access to and usage of ISTs are threatened to fall further behind and to become excluded from information society opportunities. This can be best understood as an type of interrelated social process.

Also, IST uptake is considerably lower in the southern European Member States than in the northern part of the EU. Lower uptake rates are still statistically significant when controlling for different demographics and thus cannot merely be ascribed to a different population structure. This indicated that there are national peculiarities concerning the IST involvement of older people (north/south gradient) which are environmentally rather than individually determined.

Policy Promote “e-inclusion” as a distinct target within national Information Society policies

On an EU level, the objective of social inclusion, at least the e-inclusion aspect, is an integral part of the eEurope Initiative, which was launched by the European Commission in December 1999. The ambitious objective of eEurope, which is a key element in the strategy to modernise the European economy, is “to bring the benefits of the Information Society within reach of all Europeans”. The initiative aims at accelerating the uptake of digital technologies across Europe and ensuring that all Europeans have the necessary skills to use them. The general objectives of this initiative were adopted in June 2000 by the European Council in Feira, Portugal, as the “e-Europe 2002 Action Plan”. The Action Plan sets three key objectives and attributes 11 action lines to these objectives. Here, older people are not explicitly mentioned as a specific target group but the individual targets subsumed under action line 3 generally refer to the participation of all in the knowledge based economy. In particular, they promote a new Community initiative to promote social inclusion, access to government websites for all citizens including citizens with special needs and advancing general usability requirements and guidelines in design processes. In its action plan “Towards a barrier free Europe for People with Disabilities”, the Commission communicated its commitment and aspiration to ensure the Information Society developments will be promoting social inclusion. The main objectives are to promote and ensure accessibility as a way of increasing the awareness of social and business actors and to achieve tangible progression to removing the barriers facing people with disabilities, as well as to enhance the opportunities for participation in the Information Society.

A closer look at the general IS policies pursued within the EU Member States shows that older people are addressed in these policies in different ways. However, only two countries (F & D) specifically address and make reference to older people in their general IST policies. Countries without specific policies include older people in other policy areas in particular ensuring access to ISTs through lifelong learning or in relation to the so-called ‘digital divide’.

Once again e-Europe appears to be a dominant driving force and older people are included as a target group for e-Government initiatives and measures. Other countries have plans in place to close “the digital divide”, which include specific targeting of older people.

Policy Promote “e-inclusion” as a target within national welfare and social policies

The fight against social exclusion is included in the provisions relating to the European Union's social policy through the Articles 136 and 137 of the Amsterdam Treaty. At the European Councils in Lisbon (23-24 March 2000) and Feira (19-20 June 2000), the EU Member States took an initiative toward making the fight against poverty and social exclusion one of the central elements in future European policies. The Heads of State and Government agreed that policies combating social exclusion should be based on an open method of co-ordination combining National Action Plans on Social Inclusion (NAPs) and a programme was presented by the Commission to encourage co-operation in this field. Similar activities took place with the annual circle of the European employment guidelines and the subsequent NAPs for employment. The development of skills for a knowledge based society and the fight against info-exclusions were integral components of the strategies proposed against poverty from the beginning.

On national level, the SeniorWatch country reports also addressed whether telecoms and ISTs were being referred to in general social or welfare policies or strategies in relation to older or disabled people. The reports revealed that only three countries (B, D & UK) refer directly to ISTs in social and/or welfare policy for older and/or disabled people. Other Member States address ISTs in other social policy areas such as ensuring access to ISTs for ‘all citizens’ in IS plans and in lifelong learning, digital divide and labour market policies. Three countries (B, FIN & D) have general IST policy that refers directly to empowering older people and appear quite active in this area. Other countries that do not have specific policy in this area have addressed this issue through ICT-based concrete measures and initiatives and yet others did not report any policy activity in this area nor any concrete measures or plans.

Policy Explore diverse options for enabling the “digitally challenged” to learn about the benefits ISTs may hold for them

Ageing

organisations

Our survey data provide empirical evidence that those with a lower socio-economic status are more vulnerable to falling into the category of the “digitally challenged”. In many cases people are not aware of the benefits ISTs may generally provide them. There is a need for programmes and initiatives to raise awareness particularly among less affluent and less educated people, as they are more likely to be isolated and more difficult to reach. Also they are less likely to try out ISTs because of the associated costs.

Initiatives to achieve this have been successfully carried out in several Member States. These can serve as best practice examples for other countries to follow. Networking of existing initiatives and pooling of information can improve effectiveness and efficiency of these awareness raising activities. According to existing experience, the main success factors include the following:

- taking the offer to the people instead of taking the people to the offer

- ensuring a low approach threshold
- creating an atmosphere where people feel comfortable
- developing/applying appropriate tutorials/didactic materials
- enabling learning at individual pace
- involving as many local parties (e.g. ageing organisations, municipalities, local businesses, adult education centres) as possible in order to put the issue on the local agenda.

Also, organisations other than ageing organisations could be a suitable platform for promoting awareness of IST among older people. For instance, pre-retirement courses could be utilised to explain the benefits IST potentially holds for older people. Policy should explore options to introduce IST demonstrations into all kinds of social programmes.

Nearly all older people use traditional electronic media such as television and radio. For instance, 98% of the EU 50+ population possess a TV set. Promoting the potential benefits of IST and raising awareness through these media could be a promising way to reach those who feel that new technologies are beyond their reach.

There are examples of highly successful initiatives on national level which aim at establishing public Internet access points for those who cannot afford the costs involved in getting/maintaining home access to the internet. As in the case of training measures, these can serve as best practice examples for others and again networking of existing initiatives may improve the effectiveness and efficiency of individual initiatives.

Policy

Monitor participation of older people in the Information Society and related social impacts

To measure the success of past and present policies (e.g. that the e-Europe target of an accessible Information Society is met) and to help formulate new policy initiatives, policy must be able to keep track of the participation of older people in the Information Society. However, because the nature of IST as an underlying driver of societal development that fosters change in the structure of economic activity as well as its interdependencies with social life, available statistical data from official sources is currently not sufficient to measure the shift towards the Information Society. All major national as well as supra-national statistical agencies have therefore begun to address the problems that arise from the shortcomings of available statistical data to shed light on the New Economy and the Information Society. For example, the OECD has created a "Working Party on Indicators for the Information Society" in March 1999. EUROSTAT is participating in these efforts and also has working groups dealing with these issues. Other activities include those of the Eurostat Task Force on "Information Society Statistics" which is part of the Eurostat IS Statistics Work Programme 2002/2003, the Enterprise survey on ICT usage (pilot surveys in 2001) by Eurostat and DG ENTR, and the plans for household surveys on ICT usage 2002 by Eurostat.

Also, various individual EU-funded projects (e.g. SIBIS, BISER, eBizWatch) focus on developing suitable methodologies and statistical indicators which ultimately are to be used for measuring and benchmarking progress, devel-

opment and changes concerning relevant domains and issues of the Information Society. It needs to be assured that these activities adequately consider older and disabled people when statistically monitoring Europe's progress towards a knowledge-based society. Older people and people with disabilities are currently not targeted as specific user groups by any of these monitoring activities.

Ageing organisations Ageing organisations should give IST-related issues a higher priority on their agenda

The existence of pressure groups lobbying at the policy level for older people is an important variable influencing whether the specific needs and rights of older people are addressed by ICT-related policy or not. All countries (except P) reported the existence of lobby groups for older people and most reported that pressure groups were very active in lobbying issues for older people generally. However, the level of interest shown in ICT issues was generally not as high, for example, two countries (B & F) reported a lot of activity amongst lobby groups but ICTs were not an issue for any of the groups. For other countries with high levels of activity in lobby groups, ICTs were assessed as being of 'marginal' importance as an issue. On the other hand, several of the 'very active' countries perceive ICT applications as an important issue for their pressure groups' activities.

2.2.1.5 Issue V: Non-affordability hampers IST uptake among lower income groups

As revealed by the SeniorWatch survey, available income has a strong influence on whether or not older people use IST. Although the 50+ population comprises a large potential market, cost sensitivity is likely to be high in many cases. Despite the fact that older people have generally improved their income over the past decade and comprise a group with increasing purchasing power, there are still many older people who live on low income. Despite the fact that telecommunications costs have decreased in the EU during recent years, price levels remain relatively high compared to the USA. Here, reductions in telecommunications, terminal and service prices can all be significant forces in driving the market.

Policy Encourage affordability of IST services and devices by specifying the provision for financial accessibility of basic services that should be included within universal service obligations.

For instance, alternative modes of access to basic facilities such as directories (e.g. by voice, text, display, or tactile media) should not cost more than the mainstream mode of access. Another example would include flexible tariff arrangements provided to people with functional restrictions who have low income and with particular call patterns.

Policy Include telecommunications costs within social protection and income policy.

As an increasing number of day-to-day transactions are being performed over digital networks, people who do not have access to these networks will in the long run experience fundamental disadvantages for activities of daily living, health, communications and social well-being and for general participation in society. Therefore, explicit provision for the costs which arise should be included within income maintenance and other social protections schemes.

2.2.2 Care-related IST

2.2.2.1 Issue VI: Despite considerable potential demand, the actual market for care-related applications is still in its infancy

Vulnerable people living in the community are at higher risk than others of experiencing situations where immediate healthcare intervention is required. This may be caused by their health status (e.g. in case of heart disease) or by their general physical and/or mental capabilities (e.g. in case of reduced body strength). In such cases, a remote link to a supporting party (e.g. physicians or carers) enables immediate intervention when an emergency situation occurs. Apart from this, more regular medical support (e.g. monitoring, diagnostics, therapy, rehabilitation) can be provided at a distance through IST, thus enabling the patient to stay in his/her home environment while being medically treated. This is of particular importance to older people as the prevalence of chronic diseases generally increases with age. Older people are in need of more care than the average citizen. Our data indicate that of those aged 50+ in Europe, 62% suffer from at least one chronic disease (high blood pressure 34%, joint/bone/muscle disease 26%, heart disease 17%, diabetes 9%, chronic respiratory disease 8%, other long-term condition 19%), 9% see their doctor at least once a week, 27% at least once a month, 53% less often, but only 11% "not at all". The older a person gets, the more likely they will depend on medical and social care and the more likely they will tend to live alone, i.e. without a family member to look after them.

Industry Explore market opportunities for demand-driven e-health and telecare applications

Care service providers

The results from the SeniorWatch surveys indicate that older people in Europe already have access to a wide variety of standard and advanced telecommunications networks and devices, and between 20% and 40% of them plan to buy a mobile phone or a PC for the first time during the coming two years. They have expressed interest in various e-health services to a surprisingly large extent and this interest can be expected to grow rapidly. Actual usage on the other hand is still relatively low and this may well reflect the poor availability of services, which do not yet adequately take into account the functional and computer literacy restrictions older people have to cope with.

However, national social/health systems are all suffering from increasing costs and political pressures to constrain these costs. In this context, the Internet and remote care solutions become extremely relevant because they represent the single most important technology of this generation for health-care system planners to cut costs, improve cooperation and service, deliver seamless, patient-focused care and improve medical/social outcomes. From the care recipient's perspective, IST-based solutions offer opportunities to enrich the daily care and related contacts by offering additional contact points and additional services.

This indicates that the market potential is there and that it is substantial. The SeniorWatch data shows that of the 62% of the older population in the European Union suffering from at least one chronic disease 22% or 17 million people are what we have termed "experienced frontrunners" (people with advanced IST skills) many of whom have expressed a serious interest in various e-health applications. Also, appropriate targeting of the so-called "old age beginners" (people with basic IST skills) and the "technology open minded" (people with no skills but with interest to learn about IST) will considerably enlarge the number of potential e-health customers.

To truly target this market potential, both IST equipment manufacturers and service providers will need to cater to the specific needs and expectations of the older population. Access media familiar to older people, such as TV sets (with set top boxes), (mobile) phones (voice in- and output) or services like Teletext on TV should be explored, and user interfaces should allow for convenient, easy access by people with little or no computer skills and with various disabilities. Only then does it seem likely that at least some of the voiced interest in e-health services and applications will transform into concrete market demand.

Policy Consider IST as an empowering tool for family carers when developing care-related policy

In relation to care-related policy, there is a considerable amount of positive activity in this area, with existing and recent policies that address ISTs in general healthcare policy. Based on the information from the country reports, it appears that Finland is leading the field in this area in Europe. For those countries that do not directly address ISTs in general healthcare policy (B, F, D, I, L, ES), IST-based concrete measures and initiatives exist. However, the picture appears less positive in relation to IST policy in this area addressing older people or family carers. Most countries have no explicit policy or initiatives in relation to the use of ISTs as an empowering tool for family carers, i.e., only two member states (B & UK) make specific reference to the use of ISTs in policy documents empowering family carers. Although several countries (F, G, EL, IRL, I, L & P) do not have explicit policy or initiatives that mention the use of ISTs as an empowering tool for family carers in any policy area, some countries without any policy (AUS, DK, F, NL & ES) report significant potential interest and activity in this area.

Policy Promote financial provisions for IST-based solutions within homecare delivery schemes

An overview of the financial provisions available for IST equipment to support homecare highlighted that, in general at least, funding is limited and appears to be based on local arrangements with variations between countries. The main funding activity for homecare devices can be divided into two main clusters, i.e., funding available for a selection of IST-based devices and countries with no funding sources whatsoever. The main exception here is Denmark, where ISTs required for homecare are provided free of charge. European and national/state funding is available in some countries at local, regional and transnational level for pilot IST development projects utilising the technologies identified above.

Policy	<u>Beware the danger of a "medical divide".</u>
Care service providers	Quite a substantial percentage of the older population do not have any computer skills or any interest in e-health applications or services - and this is unlikely to change in the foreseeable future. For patient-centred, seamless care to succeed, it will become increasingly mandatory for each patient/citizen to be connected to a telephone and the Internet and to acquire the relevant skills. Not having a telephone places people at a further disadvantage because telephone consultations and voice-based information services now have an important place in healthcare services. Likewise, not having an Internet connection will become a more important issue as the Internet and Web are now the source of so much health-related information and services.

2.2.2.2 Issue VII: Structural problems internal to the care sector hamper broader utilisation of IST-based care solutions

As revealed by the SeniorWatch survey of decision makers in the home care sector, care service providers deploy IST applications in care delivery processes mostly to support their mobile staff. Mobile phones have become almost ubiquitous (82%) and growth in the up-take of laptops (from current rate of 24% to 35% within two years) and of hand-held computers (from 13% to 32%) for mobile workers is impressive. Decision makers expect increases in service quality from equipping mobile workers with such devices, especially relating to the speed in emergency response turnaround times, service delivery to rural areas and overall quality assurance. With regard to actual applications of IST, social alarm services have gained considerable market penetration with almost half of the care establishments surveyed in SeniorWatch offering such services. Passive sensor alarm systems, electronic transfer of vital data, smart home technology and picture based tele-services have roused the awareness of over half of the European decision makers but uptake is at a preliminary phase. Those who deploy advanced applications or offer advanced services are usually the larger players in the homecare market with many branch establishments, an above average number of staff and a geographically wider market. Public enterprises are the forerunners in the deployment of innovative care support applications, whereas private enterprises and non-profit organisations use web-based e-commerce applications more often, and the latter also lead as regards mobile staff support.

Decision makers' attitudes towards IST implementation in care delivery processes as well as their expectations as to where the industry is moving in the field of IST are very positive. The care sector can today be described as being very open-minded towards the implementation of innovative IST-based care applications. Decision makers expect better and broader services that are empowering older people to lead an independent life for longer. They are sceptical, however, about the acceptance of IST-based services by their clientele (which contrasts considerably with the attitudes of the majority of older people) and about knowledge and skills among their staff.

Industry	<u>Pursue an integrative approach when developing IST-based solutions for the care sector</u>
	Service organisations providing homecare to older people have by now recognised - at the management level - the potential that IST applications and services offer to improving their services, to streamlining delivery processes, to reducing costs, and to gaining competitive advantages. The market potential is considerable and the market volume will grow rapidly in coming years. But it is not yet adequately addressed by both the ICT industry and service providers. The emergence of new technologies within telecommunications,

sensing, artificial intelligence, robotics etc., offers tremendous opportunities and new technology could potentially play a direct or indirect role in the delivery and support of most care services provided to European elders. However, the industry has shown very few signs of utilising new technology to improve products and services.

New products and equipment have tended to be developed in an ad hoc manner with a dedicated functionality, such as bio-medical monitoring systems or device control technology. While these are useful in themselves, they so far offer little opportunity for “packaging”. Frail and disabled older people tend to have multiple needs and problems that change over time. Problems also occur in many different contexts, which makes each case unique. Thus technology solutions need to be flexible and responsive to individual needs. They must also offer comprehensive solutions with some degree of integration to allow multiple needs to be serviced within a unifying framework.

Telecare systems often require that equipment from different vendors be used in the telecare environment. This is often true as a result of programme expansion, where (to adhere to fair practice guidelines) an organization issues a separate research framework programme that may result in a multi-vendor environment being created. Obviously in such a scenario, all equipment employed must be interoperable with each other and with the various care/medical peripherals that may be used in conjunction with it.

In the case of video conferencing, for example, units of different vendors are seldom 100% interoperable, despite meeting the same telecommunications protocols. The disparity between similar pieces of equipment can inhibit utilization and the acceptance of technology. Although technical interoperability issues are not always applicable to home care, they are a factor in certain circumstances. Therefore, technical standardization should be promoted where feasible.

Interoperability is however not exclusively a technical matter, as a telecare system also requires to be interoperable from an operational perspective. In other words, policies and procedures of one health care facility involved in patient telemonitoring or treatment often vary between facilities (even within the same jurisdiction). In any project encompassing different facilities, a common set of guidelines is required.

Industry Encourage experimentation with IST applications within day-to-day care practice.

Policy

Care service providers

At present it very difficult for carers (formal or family) and older people themselves to make decisions about what types of technology to purchase. Potentially new technology can play a greater or lesser role in most activities involved in service provision. However, without an existing major market presence, the take up of new technological solutions by service providers is likely to be limited. Unless service organisations have experienced real benefits in improved efficiency, quality and competitiveness then they are unlikely to adopt new technology. Social and health services should therefore be encouraged to experiment with the use of IST in the context of the services they provide in order to identify the benefits they may be able to gain from applying IST within their daily routines.

Care service providers Recognise IST as a strategic issue for your business.

A major barrier that still exists within care service provider organisations is the lack of intra-organisational knowledge amongst staff about the opportunities offered by ISTs and the lack of IST skills and training. Moreover, there is a lack of methodologically sound cost-benefit validation studies to convince both policy makers and investors. As a first step towards overcoming these structural deficits, care service organisations need to recognise that the application of IST-based solutions within the care process is a strategic issue for their business.

2.2.3 Accessibility related IST

2.2.3.1 Issue VIII: Mainstream services – even if designed according to the “design for all” philosophy – are not capable of catering for all functionally restricted

Functional restrictions often hinder full scale IST uptake. According to our data, older Europeans suffering from severe impairments are half to two thirds as likely to avail themselves of the internet compared with non-restricted older Europeans. Restrictions related to vision are most prevalent with 12% of the EU 50+ population (14 million) severely impaired in this regard and another 27% (33 million) reporting slight restrictions here. Moreover, 5% (6 million) are severely hearing impaired while 26% (31 million) say that they have slight problems with their ability to hear. Severe dexterity impairments were reported by 10% (12 million) while 19% (23 million) have slight problems here. Overall, 21% (25 million) suffer from either severe vision, hearing or tactile restrictions and 64% (78 million) suffer from either severe or light vision, hearing or dexterity restrictions.

Industry Accept and encourage technical standards facilitating access to ISTs for people with functional restrictions

Policy

Technical standards are important if accessible IST-based services are to become widely available. The on-line services industry and IST manufacturers should accept and encourage the development of such standards. One crucial area is the application of the emerging standards for accessible document structures for people with visual or other print-related impairments. Of particular interest and importance in this respect are the Web Accessibility Initiative (WAI) guidelines for public sector web sites. The eEurope Initiative, for instance, urges the public sector to implement these guidelines with the aim of ensuring conformity with accessibility principles. The WAI initiative is a strategy and commitment by the World Wide Web Consortium (W3C). Effectively addressing accessibility barriers would increase the role of the internet as a means of effective communication for all persons, disabled and non-disabled. Current developments and policy concerns (e.g. as stipulated by the eEurope Initiative) suggest that internet access for people with disabilities should improve significantly over the next 1-2 years, as the public sector takes the lead and improves the accessibility of its websites for people with disabilities.

Efforts to be made in order to achieve full accessibility of current and future IST-based environments should of course not be confined to the internet as it is currently. Rather, a wide range of IST systems and services (information kiosks and other public terminals, various kinds of mobile devices, etc.) have

also to be considered. Against the background of the ongoing convergence of telecommunications, computing and broadcasting technologies, standardisation issues are however not easy to tackle from an accessibility-related point of view. For example as Gill³⁴ points out, standardisation processes have followed different paths in the various IST sectors and thus "...convergence is not just bringing together three types of technologies, but also a clash of cultures. The current indications are that the needs of disabled people are a long way down the priority list for commercial organisations developing new systems and services."³⁵ Further challenges mentioned concern the lack of obligatory technical standards (the majority are voluntary or semi-mandatory) and the lack of academic content within current standardisation procedures. As regards the latter, ageing organisations could play an important role in feeding required expertise into standardisation processes. However, if non-profit organisations are really supposed to fulfill this role in a competent manner, they need to be supported in gaining both the expertise and financial resources required.

Industry Explore opportunities for providing more on-line services for functionally restricted and/or vulnerable people

Policy

Ageing organisations Some special needs and requirements cannot be sufficiently catered for by general purpose ISTs even if the ISTs were designed in accordance with the design-for-all philosophy. For these groups, traditional services could be made available in electronic form (e.g. electronic newspapers) and on-line services could be made available in multiple media (e.g. audiotex or videotex). Care service providers Moreover, vulnerable people can be supported in leading an independent life in their own home environment through remote support services.

Against this background, the availability of selected telecoms-based services³⁶ was investigated by the SeniorWatch country reports. The only service reported as available in every country was active alarm services. It must be noted, however that although the service is reported as 'available' this is not an indication of uptake or utilisation, which in some countries is relatively low. Five countries reported having all the services available (AUS, DK, FIN, F, and I), but again availability is not to be considered an indication of utilisation. TV captioning is commonplace and appears to be offered by most national TV networks across Europe. In addition a text telephony and relay service is available in almost all countries, however it has been reported that service utilisation has declined with the advent of the Internet and SMS. In relation to e-newspapers/books, this service was reported as available in only seven EU countries (AUS, D, I, FIN, F, LUX & DK).

³⁴ John Gill: Challenge of Convergence for Inclusive Design. Tiresias - Scientific and technological Reports, 2002. (available at <http://www.tiresias.org/reports/ccid.htm>)

³⁵ Ibid.

³⁶ The following AT services were asked about. Text telephone relay: allow a deaf person with a text telephone to "talk" to a hearing person with an ordinary telephone via a human operator. TV captioning: text captions on TV broadcasts using teletext or other methods. Electronic newspaper: daily broadcast of newspapers for "reading" via voice synthesiser or Braille display. Electronic books (dial-up): provides e-books downloaded by modem and then read via voice synthesiser or Braille display. Audio description (TV): provides a second audio component to TV broadcasts that describes what is happening on the screen. Remote reading of documents: a visually impaired person can contact another person by fax or other means and ask them to read a document for them.

The on-line services industry should also recognise the potential of many of their services to support the delivery of social services by public and voluntary organisations. Social service agencies can be significant customers for services like teleshopping, even if the ultimate end-consumer is an elderly or disabled person. The industry should develop better links with social services and co-operate with them in developing appropriate on-line services.

Policy

Promote the implementation of comprehensive anti-discrimination legislation

According to the experience gained in the USA, anti-discrimination legislation can be a powerful tool in stimulating the development of accessible main stream IST. In general, anti-discrimination regulation/legislation within the US tends to incorporate all marginalized groups, rather than any one specific population. Several pieces of anti-discrimination legislation exist where age is not specifically mentioned, but apply to seniors and disabled people. Within the European Union, only two Member States (DK & UK) reported the existence of general anti-discrimination policy for older or disabled people that referred to ISTs and one other (D) is currently in the process of passing laws. Regulations for people with disabilities exist in several European countries (e.g., E, AUS, & D), however these policies do not refer to equivalence of access in ISTs or telecoms. In some countries (e.g., IRL & E) without explicit anti-discrimination legislation, the issue of equivalence of access to telecoms is addressed in other more general integration policies or pieces of legislation.

EU-wide implementation of explicit anti-discrimination legislation/regulations could yield effects at two different levels. Firstly, it would facilitate general public awareness about the accessibility problems experienced by people with functional restrictions in current and emerging IST environments and thus contribute to the promotion of a general “culture of accessibility”³⁷ within the EU. Secondly, it would place real pressure on major purchasers of IST, e.g. public and private employers, to consider the importance of accessibility issues and place them on a par with safety at the workplace issues.

Policy

Put accessibility of the emerging Information Society as an explicit topic on the national policy agenda

Although in the US explicitly labelled ‘design-for-all’ legislation does not exist, it is obvious from the numerous pieces of legislation that do exist that design-for-all in telecoms and ICT has been part of policy-making for some time. Several pieces of legislation have been implemented in this regard ranging, for instance, from the Captioned Films for the Deaf Act of 1958 to the Assitive Technology Act of 1998. Currently, at least six states have passed information technology access legislation and many more have structured policies or executive orders in place that direct their approach to ensuring information technology access. To date, there has however been no clear effort to coordinate these state initiatives with federal proceedings, and this limits the effects these efforts actually have with regard to ubiquitous availability of ac-

³⁷ This expression was introduced by Shipley and Gill with regard to the corporate culture within the telecommunications industry. In our judgement, however, it also makes sense to use it in a broader sense and extend it to a general culture of accessibility to be fostered with the European Member States.

cessible main stream products and services.

In the European Union, the Lisbon Council (23-24 March 2000) of the EU directed that exclusion from the information society should be prevented and that it was necessary to pay special attention to the needs of people with disabilities. One of the objectives in this context is "to exploit fully the potential of the knowledge-based society and of new information and communication technologies and ensure that no one is excluded, taking particular account of the needs of people with disabilities".³⁸

At the level of the individual Member States, no explicit regulations or legislation have been implemented with regard to the promotion of the design-for-all concept, nor does it appear that any are in the planning phase. However, both the 'design-for-all' concept and its aspirations, although not explicitly labelled 'design-for-all', are increasingly visible in strategy statements and concrete measures. Two countries (FIN & NL) appear to be leading the way in this area in Europe and although no specific legislation or regulations concerning design-for-all exist in these countries, government statements, initiatives and research and development projects exist. Other countries without specific policy or legislation appear to have addressed the design-for-all issue in other general policy areas (e.g., AUS, F, D, IRL, I L & P) and e-Government policy in particular appears to be a dominant driving force with several initiatives aimed at implementing the sub-concept of Internet-for-all.

Similar to anti-discrimination legislation, national policy explicitly directed towards the promotion on an accessible Information Society in the widest sense could become a strong driver in creating a European "culture of accessibility".

2.2.3.2 Issue IX: Structural aspects of the assistive technology (AT) sector hamper uptake of innovative IST solutions for older people with severe functional restrictions

AT provision services vary considerably across Europe. In some countries (DK, FIN, F, D & I) legislation is in place that explicitly deals with the AT issue and most Member States appear to have a relatively clearly defined AT service delivery process (e.g., B, NL, UK, D, I, IRL & FIN). Several players or sectors appear to be involved depending on the type of AT required and AT delivery processes are predominantly based at regional or local level with final decisions regarding eligibility based at this level also. However, in another cluster of EU countries (AUS, F, P & E) processes range from very centralised and rigorous systems to poorly co-ordinated delivery processes. Moreover, recent research³⁹ revealed that, an oligopolistic structure of national AT markets keeps prices high and facilitates a situation where AT providers are not very sensitive towards new technological developments.

Policy Promote structural changes and harmonisation of current national AT delivery schemes.

As revealed by the SeniorWatch country reports, the AT service delivery systems within the EU are quite well developed compared with the USA and with Japan in particular. However, the range of equipment covered, eligibility crite-

³⁸ European Council (Employment and Social Policy): "Objectives in the fight against poverty and social exclusion". 17th October 2000. Download: http://www.europa.eu.int/comm/employment_social/soc-prot/soc-incl/approb_en.pdf

³⁹ Price Partnership Limited and Institute for Rehabilitation Research: Study on Technology Trends and Future Perspectives within Assistive Technology, 2000 (available at: www.cordis.lu/ist/ka1/special_needs/library.htm)

ria and other aspects vary widely across the European Member States. Moreover, IST equipment for day-to-day use is often not covered. Policy should explore options for encouraging structural changes in the AT sector. Improvement of existing services and harmonisation should be at the focus of such efforts. Options may for instance include the specification of an EU service delivery model for implementation at the Member State level or an improved link between purchasers of AT and RTD funding organisations.

Policy Promote needs-oriented financial support for purchasing/maintaining IST equipment within AT provision schemes

The availability of financial support for people with functional restrictions (older and/or disabled) who wish to obtain IST equipment for use in their homes differs between countries. The type of equipment included here is: PC, fax, modem, Internet browser, voice synthesiser, TV text decoder, TV audio decoder, text telephone, pager and videophone. Based on the information contained within the country reports, three main clusters of countries were identified as follows. The first cluster includes those countries that identified established direct and indirect funding mechanisms for IST equipment (B, DK, IRL, NL, P & UK). The second cluster includes those countries (AUS, FIN, F, D, I & E) that did not identify a direct funding mechanism for this type of technology, but rather that funding is based upon an individual case-by-case assessment or by application through the existing general AT funding mechanism. The third cluster includes those countries (LUX) that reported no funding for ICT equipment for use at home.

To summarise, financial support is available in one form or another for IST equipment for use at home in most EU countries. However, the funding mechanisms involved do not appear very clearly defined and are often dependent on more specific aspects of eligibility for financial support for IST equipment. For example, the existence of a 'list' of equipment, disability classification, financial circumstances, the usage context for the device, e.g., occupational, educational, daily living, etc., or may be based on price limits, i.e. support only provided up to a certain cost limit.

Policy Explore options for more effective exploitation of publicly funded RTD in the AT sector

There has been considerable funding of RTD work in the AT sector during recent years both on an EU level as well as on a national level. However, it appears that the research organisations involved have experienced considerable problems in transferring the technologies once developed into marketable AT products. Funding bodies should therefore explore new options for supporting this transfer process. Some lessons can be learned from the USA and detailed proposals have already been made on how to improve the situation in the EU⁴⁰. These include, for instance, the stimulation of "market pull", implementation of brokering, and targeted support of exploitation activities after the ending of the development phase of publicly funded projects.

⁴⁰ see *ibid.*

However, a stronger emphasis on technology transfer and development of marketable products in the AT sector should not be pursued at the expense of fundamental AT research. As revealed by the SeniorWatch technology watch activities, there is an abundance of technology-related developments which are going to fundamentally change the current technology environment. These developments relate to diverse mainstream technology areas such as telecommunications networks, interfaces, sensors, advanced material, robotics, battery technology, etc. However, due to the structural peculiarities of the AT market⁴¹, mainstream technology developments obviously need to gain a certain level of maturity before they flow into the AT research field. Due to the size of the AT market, investment capital is often lacking and this situation makes it difficult to conduct fundamental research in the AT sector with emerging mainstream technologies. Therefore, respective publicly funded RTD programmes should try to achieve a balance between fundamental research and product development/technology transfer.

2.2.4 Cross sectoral

2.2.4.1 Issue X: The lack of integration of national and EU RTD/policy strategies hampers the broader implementation of IST solutions for older people and their carers.

Most Member States have indeed recognised that IST can play an important role for older citizens. However, each Member State seems to follow its own policy agenda with particular priorities to be addressed.

Policy Encourage EU-wide consensus building and better coordination of national and EU strategies to accelerate broader uptake of IST among older people and their carers

On an EU level, older and disabled people have been explicitly targeted within RTD programmes over the last decade. For example, an important goal of the current IST programme is to ensure that all EU citizens benefit from the opportunities presented by new research and emerging technologies. To this end, the "Applications relating to Persons with Special Needs Unit including the Disabled and the Elderly" of the European Commission (Directorate General Information Society) coordinates projects to facilitate research and technological development that allow the target population to live independently, move freely, and to have access to a wider range of services and facilities. An overview of the current R&D policy and activity in the EU Member States highlighted three main clusters of countries as follows: those with specific IST/ICT R&D policy (DK, D, EL, F, E & UK), those without specific policy but with increased activity/funding reported in this area (AUS, B, FIN, I, LUX & NL); and finally those with neither specific policy nor any significant ICT-related R&D activity (IRL & P).

A more detailed analysis shows that most Member States have indeed recognised that IST can play an important role for older citizens. However, each Member State seems to follow its own policy agenda with particular priorities (e.g. "digital divide", elderly care) to be addressed under different policy lines

⁴¹ see *ibid.*

(e.g. general Information Society policy, social policy, health/care policy). Due to the lack of consensus on underlying policy/RTD principles, current approaches to promote participation of older citizens (and their carers) in the emerging knowledge based society are less than optimal. Concrete measures initiated to accelerate a broader implementation of relevant IST applications and systems (e.g. general purpose IST, care-related IST, so called assistive technology or enabling technologies) are not guided by any comprehensive strategy. Both consensus building and better co-ordination of national and European strategies would be required to ensure that older people and their carers can take full advantage of the emergence of a knowledge-based society.

2.2.4.2 Issue XI: Further research is required to understand how emerging IST-based environments can be made accessible for all citizens including those who have particular age-related user requirements

There is a range of technology-related developments that are going to fundamentally change the technology environment in which IST applications will be developed and which will serve the needs and requirements of older people and/or of those providing care to them. These relate to various technology fields such as network technologies, hard and software technologies, advanced materials, storage technologies and so forth. As computer speed and memory capacity continue to rise in parallel to miniaturization, and computing increasingly becomes networked, we can expect to see the emergence of efficient, smaller sized computing devices everywhere in our everyday environment. Ubiquitous computing will present itself in concrete forms through 'smart' products. These products could be anything from mobile devices through washing machines to clothes. As IST intelligence becomes integrated into networked devices supporting all activities of daily living, it must be accessible and usable by a variety of users and in various usage contexts. Thus, IST-based systems need to possess enough embedded intelligence to be easily adaptable – either automatically or with the least amount of intervention – to the skill level and experience of a wide range of users. In this sense, the problem of individualisation and adaptability of IST may become increasingly relevant for the population at large.

With this in mind, it is important to understand how IST-based environments can be made accessible for all citizens including those who have specific, age-related user requirements. Research problems related to these developments have already been discussed within the scientific community, and detailed suggestions for research activities have been made⁴². These will not be repeated here but it appears useful to mention at least some general aspects which need to be considered in this context.

⁴² For the following see Pier Luigi Emiliani and Constantine Stephanidis: Future Strategies. In: Bridging the Gap ? Access to telecommunications for all people. Edited by Patric Roe. Published by the Commission of the European Communities, COST219bis, 2001. pp. 211-220.

Policy Reactive RTD strategies aiming at ensuring accessibility of ISTs should be replaced by proactive strategies

Industry Reactive approaches which are based on a posteriori adaptations of existing products tend not to be viable in sectors that are characterised by rapid technological change. By the time a particular access problems has been successfully addressed, technology has advanced to a level where the same or similar problems reoccur. For example, computer access for blind people has observed each generation of technology (e.g. DOS, Windows, multimedia) cause a new set of accessibility problems which have to be addressed by dedicated solutions.

Policy Investigate non-pathological user requirement that come with ageing

Industry The question of how to ensure accessibility of ISTs - in particular of the internet – for disabled people has received particular attention within the scientific community during recent years, and recommendations have emerged about how to make specific systems (e.g. the World Wide Web, cash dispensers, public telephones) accessible for certain disability groups (e.g. blind people).

However, there has been little research into specific IST design techniques to address the functional restrictions and particular user requirements that come with ageing. According to recent research⁴³, we can distinguish between two different concepts of ageing, namely *pathological aging* and *non-pathological ageing*. The concept of pathological ageing refers to the physical and mental restrictions stemming from severe or chronic diseases that tend to accompany the ageing process. While the concept of non-pathological ageing refers to the quantitative and qualitative deficits connected with the “normal” process of ageing. As regards the latter, we know that our physical ability decreases with increasing age and this can affect our ability to see, to hear, to grasp and to smell but also our general mobility and dexterity. Also, our mental capabilities deteriorate such as our capacity of reacting to and processing information. IST-related user requirements arising from non-pathological age-related restrictions need to be systematically investigated so that they too can be adequately considered when designing IST systems and services.

⁴³ Rott, Chr., Einstellungsmuster älterer Menschen zu technischen Innovationen, Z Gerontol Bd. 21, 1988, Nr. 4, pp 225-231.