Report of a meeting of the
European Forum on Population Ageing Research

8th ERA-AGE Forum Meeting

The role of technology in achieving extended life years

Tuesday 1 March 2011

Held at:
Austrian Academy of Sciences, Vienna

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CONTENTS

1 Introduction ........................................................................................................................................3

2 Programme .........................................................................................................................................4

3 Summary of presentations ................................................................................................................6
   3.1 ERA-AGE 2: aims and update .......................................................................................................6
   3.2 European Innovation Partnerships (EIP) – first pilot test on ‘Active and Healthy Ageing’...........................10
   3.3 Ambient Assisted Living Joint Programme– an update..................................................................15
   3.4 BRAID: Bridging Research in Ageing and ICT Development......................................................19
   3.5 Technology and therapy control for geriatric patients ....................................................................25
   3.6 Innovation and the new demography .............................................................................................30
   3.7 Achieving and sustaining digital inclusion of older people: some key challenges..........................35
   3.8 New technologies emerging from biogerontology research – what is utopia, what is reality? .................................................................................................................................39

4 Break out group discussions ................................................................................................................42
   4.1 Group A - What have we achieved with new technologies for the elderly – what is still missing? ..............................................................................................................................................42
   4.2 Group 2 - What forms of multidisciplinary collaboration will maximise the development of new technologies in this field? ........................................................................................................45
   4.3 Group 3 - How much have EU-funded initiatives helped so far – what is still needed? ..................48

Annex A: List of participants ................................................................................................................51
Annex B: List of break-out group participants ....................................................................................53
Annex C: Speaker biographies ............................................................................................................55
1 Introduction

Welcome to the report for the 8th ERA-AGE Forum meeting. The European Forums on Ageing Research have been running for over 10 years and, for the last 5 years, under the aegis of ERA-AGE. Forums are gatherings of research funders, policy makers and scientists with a common interest in and commitment to ageing research. The European Research Area in Ageing (ERA-AGE) is concerned with the coordination of European research to maximise its impact and value for money.

This Forum meeting focuses on a critical ‘topic’ in ageing research and practice, technology, and we are very grateful to our colleagues in the Austrian Academy of Sciences for co-organising and hosting it.

The programme for the Forum was very full and an exciting one and the report reflects the fruitful discussions and practical outputs.

Special thanks are due to Dr Günter Lepperdinger, who took over chairing duties at very short notice due to ill-health; he did an excellent and enthusiastic job and helped to create a successful event.

I hope that you find the report informative and stimulating.

Alan Walker
Director – ERA-AGE 2
2 Programme

**Venue:** Assembly hall of the Austrian Academy of Sciences, Dr. Ignaz-Seipel-Platz 2, 1010 Vienna

**Chair:** Dr. Günter Lepperdinger, Institute for Biomedical Aging Research, Austrian Academy of Sciences, Austria

8:30 Registration and refreshments

9:30 **Opening**
Welcome and introduction – Chair: Dr. Günter Lepperdinger, Austrian Academy of Science

9:35 **ERA-AGE 2: aims and update**
Prof. Alan Walker, University of Sheffield, Coordinator ERA-AGE2

10:00 **European Innovation Partnerships (EIP) – first pilot test on ‘Active and Healthy Ageing’**
Mr. Loris Di Pietrantonio, DG INFSO, European Commission

10:30 **Ambient Assisted Living – an update**
Dr. Gerda Geyer, FFG, Austria

11:00 Break

11:20 **BRAID: Bridging Research in Ageing and ICT Development**
Dr. Benjamin Knapp, Queens University Belfast, United Kingdom

11:40 **Technology and therapy control for geriatric patients**
Prof. Monika Lechleitner, Medical Director, Federal Hospital Hochzirl, Austria

12:00 **Innovation and the new demography**
Joan Cornet Prat, Executive chairman at Fundació TICsalut, Spain

12:20 **Achieving and sustaining digital inclusion of older people: some key challenges**
Prof. Leela Damodaran, Department of Information Science, Loughborough University, United Kingdom

12:50 **New technologies emerging from biogerontology research – what is utopia, what is reality?**
Dr. Günter Lepperdinger, Institute for Biomedical Aging Research, Austrian Academy of Sciences, Austria

13:20 Lunch
14:20  **Break out group discussions**

1) What have we achieved with new technologies for the elderly – what is still missing?
2) What forms of multidisciplinary collaboration will maximise the development of new technologies in this field?
3) How much have EU-funded initiatives helped so far - what is still needed?

15:20  **General discussion**

Short report of break out group leaders followed by discussion

16:15  **End of Meeting**
3 Summary of presentations

The Forum meeting was opened with a welcome from the Chair, Dr. Günter Lepperdinger.

3.1 ERA-AGE 2: aims and update
Prof. Alan Walker, University of Sheffield, Coordinator ERA-AGE2

Prof Walker began his presentation by outlining the issues he would address, which would focus on the background to the European Research Area on Ageing:

- The emergence of European coordination
- Towards a European Research Area in ageing
- Europe’s first joint programme on ageing

The Emergence of European Coordination
As a continent Europe has historically not exploited the potential range and depth of ageing research, especially compared with the United States. Key milestones in Europeanisation of ageing research are shown below:

1991-93 European observatory on Ageing and Older People
1992 Eurobarometer
1993 European Year of Older People and Solidarity Between Generations
1999 UN Year of Older People (the society for all ages)
1998-2002 FP5 Key Action 6
2000 First European Forum on Ageing Research
2001 FORUM, SHARE
2004 ERA-AGE
2006 AAL
2007 LINK AGE, AGE-ACTION
2008 Why We Age, FP7 Road Map
2009 ERA-AGE 2
2010 FUTURAGE
2010 JPI, EIPAHA

Coordinating European Research on Ageing
Two key initiatives were reviewed:

- The FORUM project, formally known as European Forum on Population Ageing Research, which began a decade ago. The archives of Forum meetings can be found at www.ageingresearch.group.shef.ac.uk
- The European Research Area in Ageing, ERA-AGE, which has been in existence since 2004 www.era-age.group.shef.ac.uk

The need for European coordination

- No systematic linkages between centres of excellence
- Duplication of effort
- Missed opportunities
• Absence of a concerted European perspective

Towards a European Research Area: The Future of Ageing Research in Europe

Recommendations from European Forums
• Essential that ageing features prominently in Framework Programmes
• Establish a European Institute on Ageing (virtual)
• Promote multidisciplinary collaboration
• Ensure commitment to user involvement
• Build capacity: attract and support new generation of researchers to the ageing field

ERA-AGE 2
The second round of ERA-AGE funding, under FP7, began in 2009 with 13 partner countries and has already expanded to include five associate partners.

Table 1: ERA-AGE 2 partners

<table>
<thead>
<tr>
<th>Partner Countries</th>
<th>Associate Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>Romania</td>
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<tr>
<td>Austria</td>
<td>Canada</td>
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<tr>
<td>Finland</td>
<td>Sweden</td>
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<tr>
<td>Finland</td>
<td>Quebec</td>
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<tr>
<td>France</td>
<td>United Kingdom (Coordinator)</td>
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<td>France</td>
<td>Saxony (Germany)</td>
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<td>Israel</td>
<td>Bulgaria</td>
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<td>Israel</td>
<td>Lithuania</td>
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<td>Italy</td>
<td>Latvia</td>
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<td>Italy</td>
<td>Czech Republic</td>
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<td>Luxembourg</td>
<td>Spain</td>
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</tbody>
</table>

The objectives of ERA-AGE 2
• To facilitate coordination of existing ageing research programmes
• To promote multidisciplinary research activities between countries
• To share good practice in coordination and management of ageing programmes
• To develop European ageing research programmes
• To help break down the barriers between ageing research and policy and practice

Major achievements of ERA-AGE so far
• A joint post-doctoral fellowship scheme
• The creation of national agency research forums in 11 countries (based on the UK model)
• A unique database of European research programmes on ageing
• A database of European research centres
• The production of a comprehensive schedule of key research priorities for future ageing research
• Two good practice guides on research programme management a involving older users in research
• Establishment of partnerships among ERA-AGE members
Key partner in FUTURAGE

ERA-AGE ambitions
- Extension of membership to a critical mass
- Involvement of key stakeholders (regional, national, European)
- Provide infrastructure for FLARE
- Develop and implement FLARE 2
- Develop Europe’s first ageing research programme

FUTURAGE: The definitive road map for ageing research in Europe
FUTURAGE is a current FP7 project to develop a Road Map for ageing research in Europe. More information on the project can be found at www.futurage.group.shef.ac.uk

The project objectives are:
- State-of-the-art assessment of research priorities, emerging fields and methods
- Wide involvement of Europe’s leading scientists in the ageing field
- Full engagement with key non-academic stakeholders in ageing research
- Public information about ageing research
- Launch the definitive road map

FUTURAGE participants include
- 11 ERA-AGE partners
- University of Namur (Belgium)
- University of Heidelberg (Germany)
- Italian National Institute on Ageing
- Universities of Leicester and Sheffield (UK)
- University of Tampere (Finland)
- Research Users: European Older People’s Platform (AGE), Age UK

Strong political support from the European Commission has been voiced for this unprecedented project

“Ageing research is an area of great social, political and economic importance for the European Union.”

“I want to re-focus research and innovation policies very clearly on developing a coherent strategic research agenda which will tackle the grand societal challenges, which include both the promotion of healthy living and healthy ageing.”

“It is not the ageing of the population per se that is the challenge but rather the challenge to keep older people healthy.”

“These challenges can only be confronted if innovative and multi-disciplinary approaches are taken.”

“For example, the ‘FUTURAGE’ initiative is an FP7 European project which aims to produce a definitive road map which will guide European research on ageing for the next ten years to come. The ‘FUTURAGE’ programme is undertaking the most extensive consultation ever
conducted in this field and it is mobilising stakeholders, including medical practitioners, policy makers, industry and representatives of older people to work out the terms of this road map…”

Máire Geoghegan-Quinn  
Commissioner for Research, Science and Innovation  
15 April 2010

Europe’s First Joint Programme of Ageing Research

Members of the ERA-AGE consortium have developed a proposed joint programme of ageing research. The key features are:

- Focus on EIPAHA goal of extending healthy life years
- High quality science
- Multidisciplinarity
- Cross-national collaboration
- User/stakeholder engagement
- Knowledge transfer (the 3P’s)

The proposed joint programme is based on the multidisciplinary programme model from the UK, the New Dynamics of Ageing. More information is available at www.newdynamics.group.shef.ac.uk
3.2 European Innovation Partnerships (EIP) – first pilot test on ‘Active and Healthy Ageing’
Mr. Loris Di Pietrantonio, DG INFSO, European Commission

Mr Di Pietrantonio introduced the EIP-AHA (or AHAIP, as is also known) by acknowledging the importance of users and the need to connect users to policy and research; the focus of AHAIP will be on financing relevant activities. The challenges are real and current.

ICT and Demographic Ageing
Social necessity:
- 80+ population doubles until 2050
- 60+ from 20% (2000) to 29% (2025)
- 21% of 50+ population has severe vision/hearing/dexterity problems
- Today 4 persons working for 1 person retired, in 2050 only 2 persons working for 1 person retired
- Cost of pensions/health/ care go up by 4-8 % of GDP by 2025
- Estimated need for 20 million informal carers by 2025

Economic opportunity:
- Empowering elderly persons to age actively
- Wealth and revenues in Europe of persons over 65 is over 3000 B€
- 85 million consumers in Europe over 65 today, 150 Million by 2050
- Large efficiency gains from ICT in care (25%)
- Telecare market >5 B€/year by 2015 in Europe

Innovation Union - European Council, 4 Feb 2011: "Innovation contributes to tackling the most critical societal challenges we are facing. Europe’s expertise and resources must be mobilized in a coherent manner and synergies between the EU and the Member States must be fostered in order to ensure that innovations with a societal benefit get to the market quicker. The launch of the pilot Innovation Partnership on active and healthy ageing is an important step in that context."

The role of ICT and Digital Agenda
We need to address the challenge strategically, and shake up the system to create opportunities for R&D and the market. There is a need to deliver more, and better, support/systems using fewer resources. Technology is one of the ways to do this, although not the only one.
• ICT unlocks and catalyses active & healthy ageing solutions for example: integrated care, personalised medicines, smart health monitoring, social communication, “active & healthy living 2.0”
• The Digital Agenda anticipated the AHAIP and defined actions for e-health interoperability, m-health, ambient assisted living, digital literacy, accessibility

Objectives and headline target
A triple win for Europe
• Enabling EU citizens to lead healthy, active and independent lives until old age
• Improving the sustainability and efficiency of social and health care systems
• Developing and deploying innovative solutions, thus fostering competitiveness and market growth

Overarching goal by 2020
• Increasing the number of healthy life years (HLYs) by 2 in the EU on average

Example: ICT and Alzheimer’s Disease
• Total care costs of Alzheimer's disease in 2005 was €130 billion for the EU 27 region (7.3 Million people)
• ICT solutions can help to:
  – Detect disease earlier
  – Keep elderly mentally active and delay impact
  – Keep elderly at home for longer and improve quality of life
  – Assist relatives and carers through remote monitoring and tracking =>Reduce stress and workload
  – Improve efficiency of care
  – Reduce costs for society
• High social impact and large market opportunity

AHAIP – what is is?
Mr Di Pietrantonio outlined the three main areas of work which will make up the AHAIP
• Innovation in integrated care
• Innovation in prevention and personalised medicine
• Innovation in active and independent living

All three areas will be supported by cross-thematic communication and awareness activities

Ageing well and ICT: barriers
• Older people don’t use the Internet and find technology challenging
• Ageing needs are not yet represented in mainstream products
• Policy, legal and technological barriers
• Fragmented markets and business models – this is probably the main issue

Crucially there have been many pilots but little mainstream take-up. There are already examples of successful projects, but they have not yet moved to a widespread arena and there is no European solution, or one that creates a sustainable business model. The AHAIP will focus on a comprehensive approach to the three main areas of work. ERA-AGE and similar projects can help to support the AHAIP through their access to a combination of users, professionals and technologists.
What the AHAIP can do
The four areas of activities for the AHAIP are:
- Facilitating scaling up
- Joining up
- Bridging gaps
- Better framework conditions

What the AHAIP IS NOT:
- a new funding instrument
- a new R&D programme

The EIP will be a partnership of groups and people to bridge experience and bring expertise together to deliver projects. Funding will come from the Framework Programme, Structural Funds and national funds.

Active and Healthy Ageing Partnership
Mr Di Pietrantonio presented a graph showing how the existing elements of the EU research funding structure relate to the key aims of the EIP in policy and market areas. One of the aims of the AHAIP is to streamline the process and time to take products to markets by identifying the best ideas from users in response to their short term needs.

Diagram 1: AHA the wider picture

AHAIP Governance
- Light and efficient structure
- High level representatives of key stakeholders (steering group)
  - Member States, European Parliament
  - Key initiatives (JPIs, AAL JP)
  - Demand side (regions, NGOs)
  - Supply Side (industry, SMEs, service providers, research)
  - Chaired by Commission
  - Does not replace existing governance
- Provides framework for voluntary coordination
- Responsible for Strategic Implementation Plan
  - Identify key opportunities for innovation in ageing well
  - Identify barriers and actions

Developing the Strategic Implementation Plan
The SIP will develop a business model, to manage the following issues:
- Identifying key areas with high innovation potential
  - Relevance to target (HLY, QoL, Efficiency Gains)
  - Barriers
- Defining Actions to overcome barriers
  - Governed by Steering Board
- Stakeholders/investors main actors
  - Demand side: Users, NGOs, public authorities, insurance etc.
  - Supply Side: Industry, Service providers, Research etc.
- Major inputs
  - Public consultation
  - Working groups in key areas with Stakeholders

Launching Actions
- Working groups on key actions
- Demand/supply stakeholders willing to commit
- Aggregating existing innovation to large scale
  - From pilot to mainstream implementation
- Defining Actions to overcome barriers
  - New policy actions, organisational structures
- Identifying EU/national/regional funding sources
  - R&D, Innovation
  - Structural funds, EIB
  - Public/private investments
- Operational plan, targets and governance

How the AHAIP can work in practice
Example 1: fall prevention
- 1/3rd of elderly fall at least once per year, many lose independence
- We have devices for balance monitoring, physical/cognitive training, personal medication advice, ...
- But: not enough fall prevention innovation reaches the elderly
- The EIP can:
  - Join up actors to define a common strategy starting from today’s practical experiences in Europe
  - Bring together public and private insurance providers and financiers to bridge gap between investment and returns
  - Aggregate evidence to guide procurement
  - Partner standardisers, industry and users on interoperability
  - Connect researchers to citizens, carers and procurers to define world-class multi-disciplinary fall prevention
Example 2: Chronic Conditions

**Multiple chronic conditions** (heart failure, diabetes, depression, hypertension) affect 80% of people over 65

- Tele-monitoring technologies enable:
  - Hospital re-admissions to be reduced 20%
  - Heart failure mortality to be reduced by 30%
  - Care efficiency to be increased by 30%
- Need to overcome barriers
  - Common guidelines for procurers and different authorities in social and healthcare

**Milestones**

- 26 Nov 2010 - Competitiveness Council Conclusions
- 26 Nov 2010 to 28 Jan 2011 - [online public consultation](http://ec.europa.eu/active-healthy-ageing)
- 4 Feb 2011 – European Council Conclusions
- April 2011 – start of Steering Board
- Summer 2011 – Strategic Implementation Plan to Council by Steering Board
- End 2011 – taking stock of pilot

The public consultation will identify the areas on which the EIP should focus. Results from the consultation responses identified a series of priorities for action, which are shown diagram 2, below.

**Diagram 2: AHAIP priorities for action**

Priorities for action (public consultation)

Mr Di Pietrantonio urged people to regularly visit the website for more information: [http://ec.europa.eu/active-healthy-ageing](http://ec.europa.eu/active-healthy-ageing)
3.3 Ambient Assisted Living Joint Programme— an update
Dr. Gerda Geyer, FFG, Austria

Ambient Assisted Living Joint Programme
Dr Geyer began her presentation by introducing the AAL programme to those who were unfamiliar with it. AAL is a joint research and development (R & D) funding activity by 23 European Member States and Associated States with the financial support of the European Community (based on Article 185, formerly 169 of the Treaty), as shown on the map below.

- The AAL Joint Programme is a Member state driven programme.
- Member States and Associated States act on the basis of pre-existing or envisaged national R&D programmes which provide the framework for the national participations.

Diagram 3: map of AAL JP member states

The programme has as number of advantages for proposers
- Collaboration of National Programmes offers a relatively low barrier approach:
- Proposers are often already familiar with the national funding schemes,
- Communication with NCPs facilitates the participation.
- Focus on SMEs
- Focus on end-users involvement
- Regional differences often of importance

AAL Needs and Opportunities
Overall objectives of the programme:
“The overall objective of the AAL Joint Programme is to enhance the quality of life of older people and strengthen the industrial base in Europe through the use of Information and Communication Technologies (ICT).”

Dr Geyer presented a model (diagram 4) showing how three key elements - end users, society and the market – to meet the aims of:

- Better quality of life of older people
- Strengthening the industrial base in Europe
- Use of ICT – Tools, Systems and Services

Diagram 4: AAL Needs and opportunities

Objectives of AAL JP

- Develop products and services for ageing well at home, in the community and at work
- Create critical mass of R&D and Innovation at European level
- Create markets through common and compatible European solutions
- Include SMEs at all levels of activities
- Include Users at all stages of activities

Guidelines for AAL project characteristics

- Time-to-market perspective of 2 to 3 years after the project end
- Size of the consortium: 3 -10 partners
- Duration of the project: 12 –36 months
- Project total budget: 1 -7 M€
- Maximum funding from the AAL Joint Programme: 3 M€.
- The projects must demonstrate:
  - significant industry involvement, particularly SMEs (i.e.: the budget/effort associated with non-industrial R&D institutions should not outweigh that of the remaining partners)
– realistic trial set-up at the end of the project
– proactive end-user involvement throughout the life of the project
– defined market segment(s), use cases and target group(s) and address the wishes and needs of these specific groups

AAL themes and calls
AAL thematic areas, which inform the focus of calls, are shown in diagram 5 below.

*Diagram 5: AAL thematic areas*

Four AAL calls for proposals have been announced so far, one per year. They are:

- **AAL-2008-1**: “ICT-based Solutions for Prevention and Management of Chronic Conditions of Elderly People”
- **AAL-2009-2**: “ICT-based Solutions for Advancement of Social Interaction of Elderly People”
- **AAL-2010-3**: “ICT-based Solutions for Advancement of Older Persons’ Independence and Participation in the Self-serve Society”
- **AAL-2011-4**: “ICT-based Solutions for Advancement of Older Persons’ Mobility”

Participation in the first call was widespread, with at least five partners from each country, and up to 150 partners in two Italy and Spain. The type of organisations in Call 1:

- 56 ranked proposals with 452 partners:
- 47% enterprises!
- 17% user organisations!

A similar profile of organisations submitting proposals has been seen in subsequent Calls.
Call 4: ICT-based Solutions for Advancement of Older Persons’ Mobility I

Call 4 will be launched shortly.

- The call aims at ICT-based solutions which help older adults to sustain their optimal level of mobility for as long as possible, enhancing their individual sense of confidence, autonomy, competence, security and safety.
- The call addresses issues that inherently enable older people’s mobility in the sense of moving in the home and/or outside the home.
- The following topical areas are in the scope of the call:
  - Orientation and navigation
  - Assistive Technology

Background
The maintenance of mobility is thought to be fundamental to active ageing, allowing older adults to continue to lead dynamic and independent lives\(^1\). Furthermore, mobility is an important element of integration in society and thus a vital factor for perceived good quality of life in old age. A person who is mobile can perform autonomously (several) activities of daily life, can keep up his/her social network, can perform voluntary work, or leisure activities.


Solutions in the Scope of the Call
- Orientation and navigation
- Assistive Technology (mobility aids)

Projects should adopt a **holistic approach**, including the necessary expertise in the consortium. The innovation concept of the AAL JP is based on creating markets by developing solutions which meet the needs and wishes of end-users. Therefore, essential involvement of end-users from the outset of the project to its end is deemed to be essential for the success of the projects.

Upcoming events
- Launch of Call 4 expected in spring 2011
- Call 4 Infoday in Brussels 7 April 2011
- AAL Forum 2011 in Lecce / South Italy, Region of Puglia, 26-28 September 2011

For more information [http://www.ffg.at/aal](http://www.ffg.at/aal)
3.4 BRAID: Bridging Research in Ageing and ICT Development

Dr. Benjamin Knapp, Queens University Belfast, United Kingdom

Dr. Knapp began his presentation by reviewing the origins of the BRAID project. BRAID brings together nine partners from the four previous FP7 ICT and Ageing roadmap projects - AALIANCE, CAPSIL, ePAL and SENIOR (shown in diagram 6).

Creating focused Road Maps

- **CAPSIL** has developed a roadmap and Wiki for EU research to achieve effective and sustainable solutions to independent living based on an in-depth analysis of clinical requirements and the ICT scenarios developed or under development in the EU, as well as the US and Japan.

- **AALIANCE** has provided a framework for stakeholders, led by industry, to define research and development priorities, timeframes and action plans on strategically important issues in the field of ambient assisted living (AAL).

- **SENIOR** has provided a systematic assessment of the social, ethical and privacy issues involved in ICT and Ageing, in order to plan strategies for governing technology trends according to EU legal and ethical standards.

- **ePAL** has developed a strategic research roadmap focused on inducing new ways towards a balanced active life for retiring and retired professionals while promoting a new notion of the silver economy with a wide societal impact.
BRAID: Bridging Research in Ageing and ICT Development

BRAID will create a Roadmap for research in ICT in ageing looking towards FP8. Specific objectives are to:

- Create a dynamic ICT and Ageing roadmap that addresses older people’s needs not otherwise well met, that identifies and benefits from best practices in the EU and elsewhere and that analyses current and potential gaps in knowledge and execution;
- Instantiate a strategic research agenda that tracks and builds upon existing, emerging and disruptive technologies and that responds to the changing socio-economic conditions of stakeholders;
- Expand the BRAID networks of contacts to build a self-sustaining co-ordination mechanism which is viral and ubiquitous and reaches out across the heterogeneity of stakeholders.

The process

Dr Knapp presented a diagram (number 7, below) showing the various stages of the BRAID project and the interrelationship between work packages.

Diagram 7: structure of the BRAID project

The first stage for the development of the Roadmap was the development of a baseline of ICT and socioeconomic trends. The starting point was the development of a glossary of terms informed by stakeholder definitions, to create a taxonomy. The glossary covered a wide range of terms, such as:
ethics (of care), healthy/active ageing, silver economy, social computing. The goal was to establish a **common language** across the area of ICT for ageing by identify trends impacting ICT and ageing to drive towards the roadmap. The **taxonomy** examined thematic settings, needs of the elderly, and the technologies that address them:
- Includes a **Glossary** with definitions of key terms in the ICT/Ageing space, based upon broad range of European research
- Includes an extensive **Bibliography** as a resource

## Baseline
The baseline included a review of current technology trends in a wide range of scenarios and circumstances, as this example shows (in Table 2):

### Table 2: Example of BRAID technology trend mapping

<table>
<thead>
<tr>
<th>Class</th>
<th>Family</th>
<th>At home</th>
<th>At work</th>
<th>In the community</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1. Broadband access combined with Web 2.0 and social networking is providing a new way for people to maintain social connectedness with fellow professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. The need for striking trust-based relationships using technology needs to be addressed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Workplaces are beginning to recognize the importance of social networking as they start employing Web 2.0 concepts such as blogging and collaboration software in getting more cohesion in their workforce. This in turn in providing yet another way for the elderly to stay connected with fellow professionals and friends.</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>1. Broadband access combined with Web 2.0 and social networking is providing a new way for people to maintain social connectedness with fellow professionals.</td>
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<tr>
<td></td>
<td></td>
<td>1. Collaborative networking employing the principles of affective computing will address the need for trust-based relationships to be developed over a virtual network of professionals.</td>
<td></td>
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<tr>
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<td></td>
<td>1. Collaborative networking employing the principles of affective computing will address the need for trust-based relationships to be developed over a virtual network of professionals.</td>
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</tbody>
</table>

Drivers and the current trends were also examined, in a matrix which mapped:
- What are the drivers?
- What is the trend
- Is the trend supporting and/or inhibiting reaching the vision
- How much influence will the trend have on the life settings?

The five driving forces (or factors), also called drivers, defined for developing the BRAID vision are the main influencing factors in the contemporary world, which in one way or another affect the lives of senior citizens.

These driving include:
- **Technological driving force** – including infrastructure and networking, ambient technologies, supporting tools and environment, etc.
- **Societal driving force** – including demographic changes, social cohesion, values, etc.
- **Organizational driving force** – including organizational structures, actors and roles.
- **Economic driving force** – including general economical indicators, emerging business models (e.g. public-private partnerships in this domain).
- **Political driving force** – including EU, national and regional policies on different ageing-related issues.

For each of these driving forces, a set of trends can be observed, which either positively or negatively affect realization of a desired vision for senior citizens in Europe, as planned to be developed in BRAID.
Vision
The vision for the Roadmap can be encapsulated as follows:
“.... Effective roadmapping process is reliant on a significant vision as well as a commitment to what is an iterative and initially exploratory process...” – Phaal et al, 2001

- A VISION provides answer to the question of “What is a plausible desired future?” Or “where would we like to go?”
- A Roadmap provides answer to the question of “Which actions shall we take to achieve the desired vision?”

Scenarios
The Roadmap will lay out the process for reaching the desired vision of the future by examining the current status in key areas, looking at the strengths and weaknesses and performing gap analysis to develop actions for a set of scenarios, as shown in table 3.

Table 3: example of BRAID scenario mapping

<table>
<thead>
<tr>
<th>Life Settings</th>
<th>Category</th>
<th>Sub-category</th>
<th>BRAID Scenario Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent</td>
<td>Ambient Assisted living</td>
<td>Home safety and care (environmental sensors and assistive technology, communication channels, companionship)</td>
<td>Alfredo’s Story</td>
</tr>
<tr>
<td></td>
<td>Supporting physical mobility</td>
<td>Localization/positioning assistance (where am I, what is near me, which way to go), both indoor and outdoor</td>
<td>Angela’s Story</td>
</tr>
<tr>
<td></td>
<td>Mobility and Transportation</td>
<td>Mobility and Transport, walk with companion dog or robot, wheelchair</td>
<td>Pete’s Story</td>
</tr>
<tr>
<td>Healthy</td>
<td>Monitoring</td>
<td>Sensorial supervision (wearable monitoring devices, self-monitoring, remote monitoring)</td>
<td>Maria’s Story</td>
</tr>
<tr>
<td></td>
<td>Caring and Intervention</td>
<td>Medication assistance (support to remember medication, medication dispenser, memory assistance)</td>
<td>Jennifer’s Story</td>
</tr>
</tbody>
</table>

BRAID’s vision instantiations into 4 life settings
Dr Knapp described how the BRAID vision has been represented by developing examples across four life settings, called instantiations. Addressing the large set of long term audacious goals and desired facets is challenging and presents a barrier to a successful vision development and specification.

1st general BRAID vision: Building a strong, cohesive and inclusive European platform that:
- Embraces older people’s yearning to age well
- Values the broad range of capacities and resources among older people
- Supports and enables older Europeans to age actively and live independently
- Anticipates and responds flexibly to ageing related needs and preferences
- Respects older people’s decisions and lifestyle choices
- Protects those who are most vulnerable
- Promotes older people’s inclusion in, and contribution to different areas of community life”

Envisioned future:
By 2020, in the pursuit of Europe’s vision of smart, sustainable and inclusive growth, and in response to the challenges raised by a rapidly ageing demographic profile, on the basis of advanced ICT development, complemented by societal, organisational, economical and regulatory developments, Europeans, individually and collectively, will align their efforts and means to empower all senior citizens to age well regardless of gender, promoting their well being, valuing their social and economic contributions to society, and encouraging the pursuit of their fulfilment.

Four instantiations for
- Independent living
- Healthy living
- Occupation in life
- Recreation in life

For each instantiation, strengths and weaknesses were examined, and a gap analysis undertaken, as shown in diagram 8.

Diagram 8: example of BRAID gap analysis
Then facets of the vision for each instantiation were identified, which were translated into actions, and the feasibility of each action was assessed against each vision facet; the end result of this process is demonstrated in the diagram below (Table 4).

Table 4: example of BRAID action mapping

<table>
<thead>
<tr>
<th>S1 - Broadband Internet &amp; Mobile computing</th>
<th>S2 - Smart homes &amp; Internet of Things</th>
<th>S3 - Mechanisms &amp; tools for safe communications</th>
<th>L1 - Fast proliferation of tools difficult for adoption</th>
<th>L2 - Lack multidisciplinary research assistance</th>
<th>L3 - Reasoning and context awareness systems too complex</th>
<th>FEASIBILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>A11 Promoting safety and security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>A12 Extending capabilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>A13 Personal activity management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>A14 Establishing collaborative environments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hard</td>
</tr>
<tr>
<td>A15 Assisting seniors' mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hard</td>
</tr>
</tbody>
</table>

Possible mechanisms for ongoing stakeholder coordination have also been examined, considering options such as: forum, platform, network, cluster, international conferences/fairs and federations.

Next Steps for You and BRAID
Dr Knapp concluded his presentation by reviewing the future activities for the BRAID project. Four workshops with the Advisory Board and Local Stakeholders are scheduled:

1) Italy (April)
2) Denmark (June)
3) Ireland (September - Jointly with WHO meeting)
4) Eastern Europe (November)
5) Final Presentations in Brussels and Australia

Check out our website and WiKi at [http://www.braidproject.eu](http://www.braidproject.eu)
3.5 Technology and therapy control for geriatric patients

Prof. Monika Lechleitner, Medical Director, Federal Hospital Hochzirl, Austria

Prof Lechleitner began her presentation by identifying the four main areas she would cover:

- Ageing – associated with impairments and diseases
- The use of technology for therapy control – using heart disease as an example
- Studies to support technological interventions
- The application of successful technologies for geriatric patients

Ageing is associated with impairments and diseases, as shown in diagram 9. Functional and cognitive impairment common in ageing include:

- Immobility
- Incontinence
- Instability
- Isolation
- Insomnia
- Irritable Colon
- Immunodeficiency
- Impaired eyes, ears
- Intellectual impairment
- Impotence
- Iatrogene Problems (Polypharmacy)
- Impecunity (Mittellos)

Diagram 9: percent of the population with diseases and disabilities Germany 2003
Technology and therapy control
The technologies available to help people live independently include systems for:

- Monitoring of disease
- Monitoring of therapy
  - efficacy, safety
  - medication (adherence, interaction, side effects)
- Safety (prevention of falls...)

Each of these systems makes use of a number of tools including sensors, data recorders and communication networks. Examples of the types of technology and application are shown in table 5 below.

Table 5: Examples of in situ monitoring technologies for geriatric patients (Kang et al, JAGS 2010)

<table>
<thead>
<tr>
<th>Technology</th>
<th>Risk Monitoring System</th>
<th>Interventional, Alert System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable</td>
<td>Heart rate</td>
<td>Mobility monitoring in patients with Parkinson’s disease</td>
</tr>
<tr>
<td></td>
<td>Blood pressure</td>
<td>Warning for unsafe behaviours in patients with dementia</td>
</tr>
<tr>
<td></td>
<td>Activity monitor</td>
<td>Cuing of gait for rehabilitation</td>
</tr>
<tr>
<td></td>
<td>Oximetry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Glucose monitor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sociometer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Portable telephone</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Motion sensor</td>
<td>Video</td>
</tr>
<tr>
<td></td>
<td>Instrumented carpet</td>
<td>Acute fall detection</td>
</tr>
<tr>
<td></td>
<td>Refrigerator door sensor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toilet flush sensor</td>
<td>Electronic pill box</td>
</tr>
</tbody>
</table>

Health Information Systems (HIS) cover a range of solutions, including:

- Telemonitoring
  - Heart disease (heart failure, arrhythmias, pacemaker)
  - Hypertension (therapy control and adaption)
  - Diabetes mellitus (glucose control, therapy adaption, prevention of hypoglycaemia)
  - Pulmonary disease (oxygenation, aspiration)
  - Epilepsy
  - Prevention of falls
  - Malnutrition: calorie intake
  - Dehydration: Fluid intake
  - Anticoagulation (ESCAT=early self controlled anticoagulation trial)
  - Sleep monitoring
- Orientation (light, sounds..)
- Telerehabilitation
- Drug interaction (E-medication)

HIS can be used to treat and manage various chronic health conditions; Prof Lechleitner gave examples of uses for HIS in the treatment and management of a number of these conditions.
Heart disease
Heart disease was used as an example to illustrate the successful use of technologies for a range of conditions and treatments, including:

- Heart failure
- Atrial fibrillation
- Pacemaker/Cardioverter/Defibrillator
  - self-monitoring
  - remote-monitoring
  - retro-monitoring

Cardiovascular disease has a significant impact on disability and quality of life across Europe (shown in the diagram 10).

*Diagram 10: estimated Disability-Adjusted Life Years Lost (DALYs) for the top causes of burden of disease in Europe, 1990*

Tele-cardiology can be used for
- Diagnosis and monitoring of arrhythmias
- Implanted defibrillators, and pacemakers cardioverters
- Atrial fibrillation
- Heart failure

Studies and application for geriatric patients
The effectiveness of using tele-cardiology systems to treat and manage a range of heart problems has been examined in a number of studies including:

- Inglis et al (2010) Cochrane analysis: review 25 studies and found that telemonitoring of patients with heart failure reduces the rate of death from any cause by 44% and the rate of heart-failure related hospitalization by 21%
- Chaudhry et al (2010) Telemonitoring in patients with heart failure, N Engl J Med: compared the outcomes of patients whose aftercare was either managed in the normal way, or by
telemonitoring and found no difference in outcomes between both groups (180 days after enrollment)

- Abraham et al (2010) Wireless pulmonary artery haemodynamic monitoring in chronic heart failure: a randomized controlled trial CHAMPION study, Lancet: examined outcomes for patients with wireless heart monitors and found after 6 months that there was a 39% reduction in heart failure related hospitalisations among the treatment group compared to the control group.

**Examples of systems**

Implanted cardioverter defibrillation systems (IDS) can take a number of forms

- **Home – Monitoring – System:**
  - Retro-Monitoring, modified mobile telephone results from the ICD by GPRS to the telemedical center (BiotronikGmbH)
  - Physician observes the data via internet
  - Event: cardioreport by mail, SMS or telephone call

- **Housecall-plus-System:**
  - Interactive system, telephone call patient – centre, patient places telemetric transmitter to the ICD

- **Carelink System:**
  - Similar to housecall system, physician controls the data via internet

A review of main IDS options has been undertaken by Sommer et al, published in Herzschrittmachertherapie & Elektrophysiology, 2010. Studies of IDS have shown that telemonitoring is safe for patients when compared with usual care.

**Use for other conditions**

Prof Lechleitner then provided similar examples of the successful use a variety of technologies for:

- **Hypertension:** blood pressure telemonitoring
- **Diabetes mellitus:**
  - glucose self measurements, therapy control, functional insulin therapy
  - home care with telephone contact and home care with telemonitoring
  - Sensor supported insulin pump therapy
- **E-mediation:** elderly people are prone to polymorbidity and polypharmacy and technology can provide systems for lowering the risk of drug interaction and side effects
- **Cognitive impairment – problems and complications:**
  - Orientation: E-Shoe, elektronick Systems, chip
  - Activities of daily living: burning – sensor systems (bathing room, kitchen), immobility – emergency call, falls
  - medication: reminder systems
- **Training of cognitive functions (through electronic devices)**
- **Prevention of falls:** sensor systems, alarm systems – change of position (acoustics, light), e-shoe (gait), support systems for walking

**Concerns**

- Information overload for clinicians
• Guidelines, licensure, regulation
• Financing
• Reimbursement
• Concerns on technical issues (communication infrastructure, safety)
• Concerns of ethics of monitoring (threat to autonomy, privacy)

The final message from Prof Lechleitner was that: It is important to remember that in geriatric medicine each individual situation and needs are different. There is a clear need for choice and responsiveness to individuality in care and medication to reflect the needs of each patient.
3.6 Innovation and the new demography

Mr Joan Cornet Prat, Executive chairman at Fundació TICsalut, Spain

Mr Cornet Prat began his presentation by reminding the audience of the challenges the continent faces in the changing population structure in Europe, with the 60+ population expected to increase by more than 50% between 2010 and 2050. The full implication of the changes are not widely understood.

Current trends in relation with the citizen

Trends in the demographic field
- Increasing population size and increasingly aged population
- Emerging chronic diseases
- Increasing demand for medical services and healthcare staff shortages
- The Spanish population will grow around 2.1 million over the next 40 years. Citizens over 64 years will be doubled by 2 representing 31.9% of the total population.

Impact on health systems:
- Increasing pressure in health expenditure
- More time dedicated to face-to-face consultation between chronic patients and health professionals
- Increasing patient workload: risk of malpractice

New innovation perspectives on health care

How ICT can help face new challenges

Involving citizens in the care of their own health by open innovation:
- Active participation of users and customers: complaints and suggestions web 2.0
- Direct internal organizational capabilities
- Collaboration between agents

Greater citizens demands on quality and information available through transparency:
- Outward facing transparency
- Internal decision-making
- From information central to knowledge central
- Sector participation

Handle large volume of clinical information in a safely mode by boosting security:
- Ensure data privacy
- Accessibility
- Improve the traceability of operations
- Ensure system recovery for all contingencies

ICT for healthcare presents a range of challenges not seen in current widespread integrations of technology; for example, in comparison with the logistics industry, healthcare requires storage and management of data about people, which brings complex data protection challenges.
Current trends in relation to the citizen

Trends in the social field:
- Increasing demand for knowledge and access to health information by citizens
- General expectation of immediacy in the provision of all kinds of services
- Increasing public awareness of the participation in health care

Start of pilot experiences for demand management and telemedicine services using mobile devices, for example:
- Initiatives that enable family members or caregivers tracking patient's movements from an Internet portal and keeping tabs on their location

Impact on health systems:
- Need for new telematic services to give answer to the increased expectations of the population
- Development of telemedicine services that allow remote specialized care
- Development of new technologies (wireless) to promote patients autonomy and improve professionals' time management

Trends in the technological field
- Increasing use of telematic tools by the citizen
- Acceptance and implementation of online services and procedures by the citizen
- New applications that enable personalized treatments to patients
- Improved techniques for mass treatment of information

The use of new technologies in daily life has increased significantly allowing citizens to explore new telematic applications for example in Spain:
- 8,3 million homes with Internet access
- 93.5% of Spanish households have a mobile phone - More than 49 million mobiles
- Emergence and development of health applications for mobile phones - Apple has already 32 mobile health applications

Impact on health systems:
- Instant information is changing doctor-doctor and doctor-patient relationship
- The development of Information Systems provides new opportunities for telemedicine and remote care
- The emergence of smart devices provides greater control of the patient's health
- Wireless technology is a key element for Home Health (transfer health services to the patients' home)

Mobile Health, new perspective for innovation in health

The major challenges
- Increasing demand for health services :
  - Population Ageing
  - Disease Chronicity
- Increasing demand from citizens on:
- Service Quality
- Information available on real time
  - Increasing mobility of the Agents
  - Manage large amount of clinical information to access it in a safe and instantaneous way
How to face them:
  - Empowerment of patients' autonomy and specialized remote care
  - Improving through ICT, accessibility, quality, safety and effectiveness of health care
  - Promoting the use of new technologies to monitor patients in real-time

New innovation perspectives on health care
Critical factors that determine what innovations must be introduced in the health system:
  - Cost effectiveness
  - Benefit to the patient
  - Budget impact
  - Equity factors
  - Legal/ethical factors
  - Viability
  - Therapeutic benefit
  - Impact on public health

New innovation systems require new innovative perspectives. Innovation occurs across a wide range of activities and in many locations. The people innovating are normally those working in the field, but there is no common platform for them to share experiences and spread innovation. Evidence is needed to convince policy makers which innovations should be adopted and to address questions such as “how much money will this save?”, “how many people will it benefit?”.

New ICT innovation strategies must be developed; a model currently used in Spain for the implementation of innovative solutions was presented, in diagram 11.

*Diagram 11: the innovation chain in Spain*
The TicSalut Foundation
Mr Cornet Prat outlined the activities of TicSalut in supporting innovation in Spain. The organisation’s general goal is to promote the development and ICTs in the area of health. It collaborates closely with other organisations, and its four key activities are:

- observatory - trend maps
- Innovation – telemedicine and teleassistance plan
- Normalisation – office of standards
- International relations and projects

The work of TicSalut was described using the project MEDCA+ as an example

Assisted Technology Domain
Assisted Technology (AT) provides rich opportunities for innovation and encompasses:

- Tele-health
- Smart homes
- Motorised mobility
- Emergency response
- Community mobility services
- Portable health monitors
- Hearing aids
- Braille displays
- Robotics
- Text-to-speech systems

Mobile Health
Mr Cornet Prat offered mobile health as an example of a new perspective for innovation in health, particularly towards personalized medicine. This reflects a movement from Ehealth to MHealth toward iHealth

From EHealth – application of ICT in health practice:

- Use of Internet
- Creation of static Telemedicine platforms
- Appearance of the Electronic Health Record
- Development of electronic prescription

Towards MHEALTH (mobile health) – portability, global, connectivity:

- Remote diagnostics
- Postoperative follow-up via mobile
- Rehabilitation Sensors
- Control the activity of Patients’ medication in Real-time

Resulting in IHealth – customization of health services:

- Individualized Healthcare
- Responsibility and patient involvement on their own health
- Adaptation of services and healthcare information based on the citizen needs
- Immediate access to information and services
Achieving innovation
To achieve a real implantation of innovating technology, it is important to put the right questions in order to find out the right answers:

1. Where innovation comes from?
2. Which devices are the good ones?
3. Where is the money? Who pays for the services provided?
4. Who can access personal information?
5. Who is accountable for?

Mr Cornet Prat's closing message was team work is essential to achieve innovation, and find the right answers.
3.7 Achieving and sustaining digital inclusion of older people: some key challenges

Prof. Leela Damodaran, Department of Information Science, Loughborough University, United Kingdom

Prof Damodaran introduced the four key themes at the heart of her presentation:

- The long journey to connection: entry barriers
- Risks to staying in cyberspace
- Some current research
- Tackling the challenges

The long journey to connection: entry barriers

Computers were first developed in the 1950s, and became widespread during the 1960s; anyone who has grown up with computers does not understand the difficulties in learning about them.

Benefits versus perceived barriers or fears:

Digital technologies can enhance:

- personal health, self-efficacy and wellbeing
- skills and capabilities
- economic and life chances
- social interaction and cohesiveness
- civic engagement and participation

Perceived barriers or fears

- Challenging
- Frightening
- Baffling
- Frustrating
- Tiring
- Non-intuitive
- Costly

Two million Britons have come on-line in the last 12 months and more than 1 million are over 50. However, the challenge remains to then keep them online.

The risks to sustained connection are:

Cyber nuisance

- Spam
- Pop-ups
- Unwanted ‘intelligence’
- Passwords

Cyber crime

- Phishing
- Viruses
Cyber barriers – common statements from older people
- Updates, drivers, software hardware – what is it all about. I don’t understand
- It’s all gone wrong. I don’t know how to put it right
- I learnt on Windows XP. I bought a new laptop with Windows 7 on. Everything is different. I don’t know how to do my normal tasks
- My support network has gone
- I did it a while ago. Now I don’t know how to do it. My mind has gone blank – I’ve forgotten

Accessibility constraints
- Sensory impairment (especially visual)
- Motor/mobility impairment
- Cognitive impairment e.g.
  - memory
  - learning difficulties
  - language differences/difficulties

...Many people have a combination of these constraints

Costs
- Financial
- Emotional/psychological

Memory is a big issue for older people who often have problems retaining new information, especially if they use technology infrequently. Digital disengagement can be a risk as technologies evolve and the skills required change.

Disengagement
There is also the changing market to consider and the growing number of elderly using the internet. The UK Digital Inclusion Panel predicted that: “there is a real risk that in the medium to long term, significantly more citizens will migrate from being digitally engaged to being unengaged than the other way round, as their capabilities change”

Why does disengagement matter?
- Excluded people may not be able to benefit from the advantages of being online, e.g.
  - information
  - education
  - e-commerce
  - social contacts
- Excluded people may not be able to participate fully in society, e.g.
  - e-government, e-democracy

Tackling the challenge to keeping older and disabled people connected
There’s no silver bullet - many contributions will be needed: e.g.
- Research
- Business
Some current UK research

- Extensive international research is available on digital inclusion
- UK Research councils give high priority to achieving impact, informing business, government, and society. Two examples:
  - New Dynamics of Ageing (NDA) Programme: ‘Sus-IT’ project Sustaining IT use by older people to promote autonomy and independence - giving new knowledge and understanding to inform solutions to empower older people to participate fully in the digital economy and society: a 39 month collaborative project.
  - KT-EQUAL (formerly SPARC) - a consortium of UK researchers dedicated to extending quality life for older and disabled people.

Both programmes involve older and disabled people in research and bring together researchers from different disciplines, policy-makers and service users. to share knowledge and expertise to inform regulations, policy and practice across many sectors.

Key Challenges in sustaining interest

- How to stimulate interest – and investment – in sustaining ICT use by older people
- How to structure our growing knowledge base to ease transfer of knowledge to multiple stakeholders
- How to convey to funders and to individual institutions the resource intensive nature of large scale multidisciplinary projects

Meeting the challenges of multidisciplinary working

- Learn about others’ methods and constructing collaborative models.
- Acknowledge and accommodate differences in working culture, language and behaviour.
- Professional facilitation
- Modify institutional expectations and performance measures to support it.

Next steps:

Multi-disciplinary problem-solving is required to generate sociotechnical solutions to reduce the barriers to sustained ICT use, for example:

- Technical design changes: designing for adaptivity
- Hardware design which embeds the technology
- Solutions which reduce the cognitive load (effort and memory) of using ICTs

Effective learning and support is also essential. Emerging findings show preferences for:

- Slower pace of delivery,
- Paper-based aides memoire and documentation
- Learning in informal settings with peers or one-to-one
- Particular requirements include: better provision of information on selecting ICTs, support in the home and in the community
There are two key policy issues which need addressing before progress can be made.

- Whose responsibility is it to ensure older people can continue to access services on-line as the age?
- Whose responsibility is it to provide reassurance to quell the fears and misgivings voiced by growing numbers of older people regarding use of the internet? E.g.:

**Conclusions**

Prof Damodaran’s closing comments were:

- Risks of disengagement are a serious threat to long-term digital inclusion of older people
- Awareness of the issues and solutions is limited
- High level of investment in helping older people to become connected vs very low-level of investment in sustaining digital engagement
- There are many challenges for researchers; policy makers; business leaders; and other key stakeholders to address as a high priority
3.8 New technologies emerging from biogerontology research – what is utopia, what is reality?
Dr. Günter Lepperdinger, Institute for Biomedical Aging Research, Austrian Academy of Sciences, Austria

Dr Lepperdinger put forward his theories on technological developments in the biogerontological research arena, beginning with an overview of ageing and the life course.

Ageing and lifespan
The integrative synopsis of ageing theory: Ageing = genes x environment
- Genes load the gun
- The environment pulls the trigger

The current model of life span is an effective frame for reproduction, and ensuring parents survive until their offspring themselves reproduce. There is a need to sustain both the species and one’s own body.

Both programmed and stochastic event affect the ageing process, and one of the most challenging aspects is working out what is deterministic and what is random/the effect of the environment (diagram 12).

Diagram 12: main circuit impacting the life span

Three stages of biomedical ageing activity were identified:
- Inevitable consequences
  - Genotoxic scarification – cancer & neoplasia
  - Molecular damage – cellular dysfunction
  - Cellular dysfunction – organ derailment
  - Endocrine lapse – hyper/neoplasia
  - Immune fade – chronic infection
  - Somatic decay – frailty
• Natural programmes for compensation – positive effects of inherited traits
  – Genotoxic scarification – cellular senescence
  – Molecular damage – aggregates
  – Cellular dysfunction – encapsulation
  – Endocrine lapse – organ remodelling
  – Immune fade – anti-autoimmunity
  – Somatic decay – retirement

• Putative de-ageing measures – mechanisms which can be used to control some of the conditions
  – Genotoxic scarification – DNA repair/telomerase
  – Molecular damage – proteasome / autophagy
  – Cellular dysfunction – apoptosis / replacement
  – Endocrine lapse – exocrine reprogramming
  – Immune fade – haematopoietic fitness
  – Somatic decay – stem cell protection

Successful ageing is defined as:
1. low risk of disease or disability
2. mental and physical function
3. active engagement in life

A multidisciplinary approach
We have gained years of lifespan extension but there are clear differences between social groups. It is not clear how income/wealth results in better biology for individuals. Biomedical ageing research needs a multidisciplinary approach including three main areas of focus:
• Process of ageing
• Diseases of ageing
• Technology for ageing

Professor Lepperdinger presented some different technologies and advances:
• Ambient assisted living vs biomedical engineering – exoskeleton
• Regenerative medicine – bone repair
• Biosensors – on line in vivo monitoring
• Interventions/preventions – personalised medicine

One of the problems is not getting data, but using data – once you attempt to contextualise any date and understand the consequences you get are faced with the complexities of systems biology. Systems biology is dynamic and constantly changing.

Nature vs nurture
The epigenetic perspective says that the genes remain the same, but the wrapping of the genes – whether open or closed – changes during ageing. Epigenetics is the study of changes in gene activity that do not involve alterations to the genetic code but still get passed down to at least one successive generation. It is these epigenetic “marks” that tell your genes to switch on or off, to speak loudly or whisper. It is through epigenetic marks that environmental factors like diet, stress and
Prenatal nutrition can make an imprint on genes that is passed from one generation to the next (diagram 13).

**Diagram 13: nature vs nurture**

What you eat makes a huge difference – dietary intake affects the rate of ageing and some studies show that caloric restriction leads to a longer life. Offspring are affected by unusual levels of early nutritional exposure in the womb; both maternal obesity and caloric restriction can affect the physiology of offspring and make them more likely to develop metabolic syndrome.

The challenge now is to use technology to undo some of the changes which are passed on from mother to offspring – to get the ball back up Waddington’s landscape (diagram 14). The deterministic elements are not necessarily irreversible.


Professor Lepperdinger concluded by reminding attendees that mental health is one of the key determinants of wellbeing, and it is important that people feel well, rather than just look well.
4 Break out group discussions

Participants of the meeting were organised into three working groups. Each group were assigned a Chair and a note taker.

**Group A - What have we achieved with new technologies for the elderly – what is still missing?**

**Group B - What forms of multidisciplinary collaboration will maximise the development of new technologies in this field?**

**Group C - How much have EU-funded initiatives helped so far – what is still needed?**

Working groups were asked to discuss key issues surrounding each of these questions, and working group findings were presented to the closing plenary. Working groups comprised research funders, scientists, policy makers and end users from 16 European countries. Discussions were lively and fruitful, resulting in the findings summarised in this section.

### 4.1 Group A - What have we achieved with new technologies for the elderly – what is still missing?

**Co-Chairs:** Prof. Dr Wolfgang Zagler, Rehabilitation Technology, Vienna University of Technology, Austria and Dr Benjamin Knapp, Sonic Arts Research Centre, UK

**Rapporteur:** Juliet Craig, University of Sheffield, UK

The Chairs opened the discussion by asking participants to reflect on general topics, rather than detailed projects, from the last 5 years to ensure a focused and relevant discussion. The group were first asked to contemplate what new technologies have achieved for the elderly so far. The following issues were identified:

- Social networking technologies have increased the ability to share experience of illness and health care, and gather insight and advice on both a formal and informal basis; no-one knows better than the patient of the experience of living with a particular illness or condition and this information can be useful both to other sufferers and health-care providers.
- Affordable technology caused by falling costs has enabled access to mobile and static technologies by many more people. In particular mobile telephone ownership has increased dramatically – in some countries there are more mobile telephones than there are people.
- Broadband and other high bandwidth communication has become more widespread and often the norm in many countries, although it was acknowledged that this is not universal throughout Europe. As well as enabling personal computing (for social networking), it also supports telemedicine, video consultations and the transfer of large data files such as imaging, to aid diagnoses.
- There is significant potential in existing technologies which has yet to be fully exploited
- Smart homes were identified as an area which has strong potential for effective, and widespread adoption as shown by a large number of pilot projects across Europe, although application of the concept remains underutilised
The group then discussed what technologies for the elderly were missing from existing projects and plans:

- Although already identified during discussion about smart homes, the implementation gap was considered to be a significant factor by all attendees. Pilot projects using existing technology are well advanced in a number of areas, yet effective knowledge transfer and implementation is elusive.
- Also missing was a model for standards in support of sharing and communicating healthcare data between countries. It was noted that there are no common standards within some countries which have information separation protocols between different state functions.
- Despite recent decreases in the cost of technology and expansion of connectivity, there is unequal access to technology across Europe and within countries, primarily due to poverty and geographical features. This is a particular challenge as technological support for caring, to prevent falls/support mobility, or for telemedicine can be most effective for older people without regular access to other support due to their remoteness or lack of access to relevant expertise.
- One of the largest challenges to Europe-wide healthcare is that expertise resides only at a national level, not at a European level (as there is no European healthcare system); therefore how can European healthcare solutions be effectively identified and implemented?
- The use of Europe as a sustainable international living lab to test technologies aimed at the ageing population was also missing; there are a number of regional initiatives, but none that effectively cover Europe. However the potential of this could be limited, due to distinctive national and cultural preferences which would be too strong to make results transferable.
- Finally, a platform to develop evidence and metrics to prove technology is effective and will save money is needed. This would support knowledge transfer and implementation by providing evidence that a given intervention will save over a specific period, more money than it costs to initially implement.

Further discussions looked further into the future to focus on broader challenges. These were identified:

- Whether government funded research can generate innovative technologies?
- Whether the use of in-home robotics /automated systems for long-term care will become widespread or whether cultural issues will limit implementation.
- How to achieve economies of scale with initially expensive interventions
- How to balance human-delivered care and technology-delivered care
- The need to balance the interests of state, market and civil society
- The development of best practice to inform the public and drive demand for new technologies; one route to implementation is for the public to demand new technologies, and the challenge is to achieve “iPad desirability”
- The development of trust in older people in the technology they can access

Finally the group made some recommendations to help address the gaps and meet the challenges for the future:

- Awareness, of solutions and benefits, should be raised across all aspects of society; governments need better understanding of what is available and the cost benefits of it, health and social care workers should understand what works, businesses to know which sectors have potential, and older people themselves need to know what their options are and how to access them.
- The use of living labs was encouraged, despite potential drawbacks
• The creation of compatible European platforms in eldercare and healthcare to work across systems and countries
• Evidence creation on the benefits and business models of technology.
4.2 Group 2 - What forms of multidisciplinary collaboration will maximise the development of new technologies in this field?

Chair: Dr Günter Lepperdinger, Institute for Biomedical Ageing Research, Austrian Academy of Sciences, Austria

Rapporteur: Anouska Kettle, University of Sheffield, UK

After a general introduction the Chair asked the group to define the problem that needed to be addressed and to establish why the problem existed. Members of the group proposed that the problem be defined as: “How to address Healthy Life Years, and staying active in society”. It was suggested that a disciplinary approach should be taken to examine what technology was required by, for example sociological, cultural and medical perspectives.

A general discussion evolved about the definition of ‘healthy years’; the group clarified the concept as being about adding ‘life to years’ rather than ‘years to life’. Active and healthy ageing was clearly preferred to (not necessarily healthy) longevity.

Falls and fall prevention were the topics suggested as case studies for multidisciplinary collaboration. Group members were asked to contribute their own perspectives to form a basic model of how a group of experts approach and confront working in a multidisciplinary manner. An example was cited under the umbrella of ‘fall prevention’: building a house is necessarily multidisciplinary; there is no choice in the selection of expertise required and all disciplines must respect each other’s contribution. There is a natural psychological barrier to respecting the input from other disciplines as they naturally fall second to your own interests in your professional and personal priorities. The group was asked to consider these issues when tackling the task and acknowledged this as one of the basic problems with undertaking this type of research.

One member of the group offered an example of his daily working life where he regularly sits down with policy makers and politicians, to discuss the expression of local needs. This might include a local physician, social actors, and medical experts. They challenge is to take into account all constraints and to address the problem in the most efficient way by using input from all disciplines. With reference to the house building example the core discussions would take place between architects and builders, taking into account issues raised by other professions (sociology) such as "social links between generations" and "space for children to play" (public health).

The group debated the idea but felt that it did not address strategic issues, particularly who, in which discipline, decided which were the most important needs. In this scenario the needs are generated by an initially larger list which then goes through iterations of refinement. Once the final needs have been identified then the required technology is identified and expertise brought in. Should every discipline be involved from the beginning in the development of that initial list of needs, and if so how?

This was not deemed a multidisciplinary method of working by the group as they felt there should be wider disciplinary involvement. There were also identifiable gaps in the process: for example despite thinking that this was an iterative process, accessible and that input was welcome there was no end user involvement for example. Crucially at no point in the process were the elderly consulted about their perceptions and experiences of falling.
The above example was also only part of the problem of fall prevention and did not address aftercare of a person who has had a fall. There is little long term psychological evaluation, or recording of psychological needs and physical adaptation required post-fall. Once a person has fallen once it is likely that they will have an altered perspective on their surroundings and may need re-educating and tailored personal care to deal with this. Generally this is not built into the care system or indeed into fall prevention technology and research. When it has been undertaken it is generally considered that the research is not robust or representative enough to be utilised in an effective manner.

At this point a new model for multidisciplinary research model was proposed. The methodology would follow this pathway across all disciplines:

- Identify problems on a broad scale
- Identify the need for task forces to address these problems
- Allow task forces freedom to appoint and seek their own experts
- Run through several iterations of this process, always in a cyclical manner, including and discarding expertise and input as needed
- At all times practice prioritisation exercises and look for linkages across task forces.

The main argument against this model was that the problems were unlikely to be singular to start with and the identification of the task force would prove difficult. On a more practical note it was noted that accessibility to resources is a fundamental problem. In this instance lobbying is key, but with a multidisciplinary approach it is often unclear who should be lobbied. In this example fall prevention could be relevant to government ministries of: Health, Housing, Welfare/Social Care. The group therefore agreed that cooperation and coordination between ministries would be beneficial.

It was also agreed that in undertaking multidisciplinary research there should always be recourse to a case study or some sort of exemplary model, and that a library of case studies/examples is needed, and a virtual European institute of ageing research could include this. This resource would provide a repository of mutual experience and expertise and would enable quality of, and accessibility to, multidisciplinary research, training and data delivery.

In light of this the group agreed that two forms of collaboration were possible:

1. Inside the field, at a disciplinary level
2. High level collaboration, at a policy level

General points that were touched upon throughout the session included:

- How IT can solve the discrepancy of mean life years across Europe?
- How to overcome frailty (physical, psychological and social) in the elderly
- Whether the field also encompasses “ageing population and demographic changes”

Why the problem exists:

- Scientists and policy makers are always limited in their expertise that is why they must have input from multidisciplinary research.
- Actors often incorrectly identify when collaboration should be sought and at what point it is beneficial to share.

In conclusion, in light of the lack of a centralised resource for exemplary multidisciplinary research, the group agreed that sufficient strength in the research area needed to be built up in order to
effectively lobby politicians. An effective way to do this would be to build up personal networks, to demonstrate effective use of end user opinion and to strategically target politicians and policy makers at the highest level with irrefutable research outputs that demanded attention over a long term planned research agenda.
4.3 Group 3 - How much have EU-funded initiatives helped so far – what is still needed?

Chair and rapporteur: Christina Bonora, Institute for Biomedical Ageing Research, Austrian Academy of Sciences, Austria

The group took a very positive view of EU funded initiatives in this area and began by identifying initiatives which have been successful so far. AGE Platform Europe was particularly identified as a very helpful tool for older people. Additional examples cited included:

- Value+ created a range of deliverables on how to involve patients in EC co-financed (and other types) of projects ([http://www.eu-patient.eu/Initiatives-Policy/Projects/EPF-led-EU-Projects/ValuePlus/Resources/Value-Resources/](http://www.eu-patient.eu/Initiatives-Policy/Projects/EPF-led-EU-Projects/ValuePlus/Resources/Value-Resources/)) see its toolkit, handbook, policy messages, and database
- epSOS is an ongoing large-scale pilot at the deployment end of collaborative work in eHealth especially electronic health records and ePrescribing ([http://www.epsos.eu/](http://www.epsos.eu/))
- CALLIOPE is a thematic network, not only supported the above mentioned large-scale pilot, but also created a mechanism for reflecting on the advances and outcomes of the pilot. End of the project: November 2011. ([http://www.calliope-network.eu/](http://www.calliope-network.eu/))
- Now a new mechanism has started up – the eHealth Governance Initiative – led by the Austrian Ministry of Health (no website address since kickoff will be in Budapest, Hungary in May 2011)
- CPME the issue here is building trust, and health professionals and patients should mutually be involved in this kind of initiative e.g., “Chain of Trust” which also involves the European Patients’ Forum ([http://www.cpme.be/index.php](http://www.cpme.be/index.php) and [http://www.eu-patient.eu/](http://www.eu-patient.eu/))

The discussion then turned to what is still needed to improve to better connect technology and extended life years, and four areas were identified:

- End user involvement
- Dissemination and sharing of project results
- Implementation of findings
- Continuation of funding

End user involvement

The group agreed that more user involvement in EU-funded projects is needed and a systematic approach was required to deliver this. One suggestion was that organisations should be invited to contribute to a list of potential users and user groups/organizations to provide a supporting resource for all projects, at both a national and EU level.

It was also noted that end users are no homologous group and there is a lack of understanding about how to involve elderly people in a project. In the technology field one potential barrier to end user engagement was fear of technologies. As a result it was suggested that a reference group for older people and technology should be established to support development and implementation; this would
also encourage a pull from the market where older consumers would drive adoption, rather than technology decisions for older people being made by social care bodies.

In addition EU projects should focus on useful outcomes relevant to end users, especially:

- Policy guidelines
- Statements how to involve patients/other users
- Best practice/guidelines for project coordinators

AAL, who were represented in the group, reported that they divide users into three areas:
- Primary users (with numerous subgroups): older people
- Secondary users: care organizations, institutions
- Tertiary users: contributors (administrative groups)

Information and expertise is still required, depending on the requested solution and a plan is needed on how to integrate older groups in events and business plans. It was noted that end user involvement should not be just information gathering, but a real integration to benefit a project; engaging with end users costs time and money so the investment needs to add value added to a project.

Other issues related to end users engagement were identified as:

- The need to create equal levels within different expert groups, and to find common language/terminology
- Possibility to prolong running projects to have time for real end user communication
- Lack of flexibility concerning the duration of projects
- The time consuming nature of end user engagement; potentially overcome by cooperation with established end user groups or the installation of a Scientific Advisory Board
- The difficulties in efficient disseminating to end users; key issues were identified as choose the right channel, using the right strategy, continually improving dissemination activities, particularly through training

Two strategies for effective integration of end users in consortia, especially from the beginning of the project were suggestion: implementation of guidelines for acting with end users, and; approvals on how to get them involved. Ongoing challenges include: differing levels of openness/accessibility between groups; the methodological mix in integration and; the integration of a wide range of feedback to an established project process. Further issues requiring resolution included:

- Convincing clinicians of the benefits
- Overcoming gaps between research projects – often pilot studies are not implemented
- Whether the end users are members of the research team or beneficiaries of the research

**Dissemination and sharing of project results**

It was noted that even successful projects have difficulty sharing their results with the public, and that dissemination this should be encouraged for both national and EU projects. However some of the challenges of dissemination were identified as:

- How to attract people, especially end users and those with a direct interest, to the project
- How to make them interested
- How to effectively communicate project results
The group agreed that the key issue was to find a common language with the right tone and content, and that all activities should be supported by good practice in attracting end users and policy makers. Project websites should be updated regularly, particularly with outcomes and all members of a consortia should be encouraged to see the entire project as a process, warranting as much attention as the outcomes. Project partners should also be called upon to make greater effort to make the project effort and results visible, also after the end of the project.

It was observed that this is symptomatic of a wider research culture clash of misunderstanding between scientists, policy makers and end users/general public. Connecting science with the market is difficult before project results are available. Lack of time was also cited as a barrier and it was suggested that projects should be prolonged to allow dissemination and to make connections to businesses, end users, or to perform pilot studies.

Implementation of outcomes
The implementation of project outcomes, particularly those with a product focus was also highlighted as an area where greater support is needed for EU projects. To overcome failure in implementation/knowledge transfer the suggestion was that a full evaluation of why the implementation plan fails or is not performed well was undertaken, with particular scrutiny on the following areas:

- Was there no real market?
- Was the market size judged wrongly?
- Was there a consumer problem?
- Have the end users/customers been approached in the appropriate way?
- Was the time to market calculated too short?

Echoing the point made about dissemination, the lack of time for implementation beyond the lifetime of project was identified as a barrier; additionally greater sharing of best practice was required.

Connections between EU funding programmes and strategies
The need to join up EU research funding strategies was raised, particularly in light of the implications of the Innovation Union planned in the Europe 2020 strategy. Ensuring connection between the innovation agenda and the successor to Framework Programme 7 could result in the solution to some of these problems.

Summary
The group concluded that there are many excellent examples of cooperation, but there is still a lot of work to do. The focus on end user involvement is a critical point, but sometimes problematic due to the heterogeneity of the end user population. This could be overcome by: a database of potential end users and user organisations; better integration into the project; development of trust in technology to lower anxiety, supported by a reference group/person; choice of the right language to communicate. Effective dissemination of project results would help support end user engagement but projects need to be prolonged to enable this to happen; skills also need to be increased in this area. Implementation of results could be improved through better planning and evaluation; innovation and research outcomes should be clearly connected to the market. Finally it was deemed essential to contribute to the consultation to the FP7 successor to influence ideas on integration of end users and dissemination and implementation of project results.
### Annex A: List of participants

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<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Country</th>
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<tbody>
<tr>
<td>Professor Kenneth Abrahamsson</td>
<td>FAS - Swedish Council for Working Life and Social Research</td>
<td>Sweden</td>
</tr>
<tr>
<td>Dr Omar Saeed Al-Mushayt</td>
<td>College of Computer Science &amp; Information Systems, Jazan University, Jazan</td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>Mr Gabor Balazs</td>
<td>GE Healthcare Hungary</td>
<td>Hungary</td>
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<tr>
<td>Dr Ludovica Banfi</td>
<td>EU Fundamental Rights Agency</td>
<td>Austria</td>
</tr>
<tr>
<td>Mag. (FH) Christina Bonora</td>
<td>Institute for Biomedical Ageing Research, Austrian Academy of Sciences</td>
<td>Austria</td>
</tr>
<tr>
<td>Professor Rossitsa Chobanova`</td>
<td>Bulgarian Academy of Sciences</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>Professor Mihail Coculescu</td>
<td>The Ministry of Health and Family</td>
<td>Romania</td>
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<tr>
<td>Dr Aaron Cohen</td>
<td>Ministry of Health</td>
<td>Israel</td>
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<tr>
<td>Mr Joan Cornet Prat</td>
<td>Fundació TicSalut</td>
<td>Spain</td>
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<tr>
<td>Ms Juliet Craig</td>
<td>University of Sheffield</td>
<td>UK</td>
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<tr>
<td>Mr Peter Csato</td>
<td>GE Healthcare Hungary</td>
<td>Hungary</td>
</tr>
<tr>
<td>Dr Aurelia Curaj</td>
<td>UEFISCDI</td>
<td>Romania</td>
</tr>
<tr>
<td>Professor Leela Damodaran</td>
<td>Department of Information Science, Loughborough University</td>
<td>UK</td>
</tr>
<tr>
<td>Professor Bojimir Davidov</td>
<td>Institute of Population &amp; Human Studies, Bulgarian Academy of Sciences</td>
<td>Bulgaria</td>
</tr>
<tr>
<td>Gertraud Dayé</td>
<td>BIVA (Representation of interest of users of homes &amp; services in old age &amp; dependency)</td>
<td>Germany</td>
</tr>
<tr>
<td>Mr Loris Di Pietrantoni</td>
<td>European Commission</td>
<td>Belgium</td>
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<tr>
<td>Mr Norman Fisch</td>
<td>Fonds National de la Recherché (FNR)</td>
<td>Luxembourg</td>
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<tr>
<td>M. Belén Frades</td>
<td>Fundacion Cien</td>
<td>Spain</td>
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<tr>
<td>Dr Gerda Geyer</td>
<td>FFG - Austrian Research Promotion Agency</td>
<td>Austria</td>
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<tr>
<td>Dr Michele Goodhardt</td>
<td>INSERM</td>
<td>France</td>
</tr>
<tr>
<td>Dr Hilde Hawlicek</td>
<td>Pensionistenverband Osterreichs</td>
<td>Austria</td>
</tr>
<tr>
<td>Dr Renate Heinisch</td>
<td>EESC - European Economic &amp; Social Committee</td>
<td>Germany</td>
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<tr>
<td>Professor Christopher James</td>
<td>Institute of Digital Healthcare, University of Warwick</td>
<td>UK</td>
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<tr>
<td>Ms Anouska Kettle</td>
<td>University of Sheffield</td>
<td>UK</td>
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<tr>
<td>Ms Vera Kiss</td>
<td>EU Fundamental Rights Agency</td>
<td>Austria</td>
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<tr>
<td>Dr Benjamin Knapp</td>
<td>Sonic Arts Research Centre, Queens University, Belfast</td>
<td>UK</td>
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<tr>
<td>Volker Köhn</td>
<td>Saxon State, Ministry of Social Affairs and Consumer Protection</td>
<td>Germany</td>
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<tr>
<td>Mrs Eleonora Kovacs</td>
<td>GE Healthcare Hungary</td>
<td>Hungary</td>
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<tr>
<td>Mgr Alžběta Krausová</td>
<td>Masaryk University</td>
<td>Czech</td>
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<tr>
<td>Anissa Lardjane Womedlaw</td>
<td></td>
<td>Republic</td>
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<tr>
<td>Ms Elena Leal González</td>
<td>Ministry of Science and Innovation</td>
<td>Spain</td>
</tr>
<tr>
<td>Professor Monika Lechleitner</td>
<td>Federal Hospital Hochzirl</td>
<td>Austria</td>
</tr>
<tr>
<td>Dr Anja Leist</td>
<td>University of Luxembourg</td>
<td>Luxembourg</td>
</tr>
<tr>
<td>Mrs Beatriz León Salas</td>
<td>Carlos III Institute of Health</td>
<td>Spain</td>
</tr>
<tr>
<td>Dr Günter Lepperdinger</td>
<td>Institute for Biomedical Ageing Research, Austrian Academy of Sciences</td>
<td>Austria</td>
</tr>
<tr>
<td>Mr Roland Lohner</td>
<td>GE Healthcare Hungry</td>
<td>Hungry</td>
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<tr>
<td>M. Philippe Metzenthin</td>
<td>MEDeTIC</td>
<td>France</td>
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<tr>
<td>Professor Genoveva Mihova</td>
<td>Institute of Population &amp; Human Studies, Bulgarian Academy of Sciences</td>
<td>Bulgaria</td>
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<tr>
<td>Assoc Prof. Dr Sarmite Mikulioniene</td>
<td>Mykolas Romeris University</td>
<td>Lithuania</td>
</tr>
<tr>
<td>Dr Dana Galieta Minca</td>
<td>Romanian Ministry of Health</td>
<td>Romania</td>
</tr>
<tr>
<td>Assoc Prof. Dr Mohamad Noordin</td>
<td>College of Computer Science &amp; Information systems, Jazan University, Jazan</td>
<td>Saudi Arabia</td>
</tr>
<tr>
<td>Dr Roger O'Sullivan</td>
<td>Centre for Ageing Research &amp; Development in Ireland (CACDI)</td>
<td>Ireland</td>
</tr>
<tr>
<td>Assoc Prof. Dr Roslina Othman</td>
<td>College of Computer Science &amp; Information Systems, Jazan University, Jazan</td>
<td>Saudi Arabia</td>
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<tr>
<td>Dr Maria Raquel Patricio</td>
<td>Institute Polytechnic of Braganca</td>
<td>Portugal</td>
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<tr>
<td>Dr Gabriel Prada</td>
<td>Ministry of Health and Family</td>
<td>Romania</td>
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<tr>
<td>Dr Iris Rasooly</td>
<td>Israeli Ministry of Health</td>
<td>Israel</td>
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<tr>
<td>Mr Alain Rozenkier</td>
<td>CNAV</td>
<td>France</td>
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<tr>
<td>Mr Michel Tuchman</td>
<td>CNAV</td>
<td>France</td>
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<tr>
<td>Dr Elena Urdaneta</td>
<td>INGEMA</td>
<td>Spain</td>
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<tr>
<td>Dr Gert-Jan Van Der Putten</td>
<td>Radboud University Nijmegen, Medical Centre</td>
<td>The Netherlands</td>
</tr>
<tr>
<td>Professor Alan Walker</td>
<td>University of Sheffield</td>
<td>UK</td>
</tr>
<tr>
<td>Mr Christian Wehrmann</td>
<td>VDI / VDE-IT</td>
<td>Germany</td>
</tr>
<tr>
<td>Ms Diane Whitehouse</td>
<td>The Castlegate Consultancy</td>
<td>UK</td>
</tr>
<tr>
<td>Dr Larry Willmore</td>
<td>IIASA</td>
<td>Austria</td>
</tr>
<tr>
<td>Benjamin Wimmer</td>
<td>CURE - Centre for Usability Research and Engineering</td>
<td>Austria</td>
</tr>
<tr>
<td>Dr Javier Yanguas</td>
<td>INGEMA</td>
<td>Spain</td>
</tr>
<tr>
<td>Prof. Dr Wolfgang Zagler</td>
<td>Institute 'integrated study' fortec - Rehabilitation Technology, Vienna University of Technology</td>
<td>Austria</td>
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Annex B: List of break-out group participants

**A: What have we achieved with new technologies for the elderly – what is still missing?**

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<td>Spain</td>
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<td>Germany</td>
</tr>
<tr>
<td>Professor Christopher James</td>
<td>Institute of Digital Healthcare, University of Warwick</td>
<td>UK</td>
</tr>
<tr>
<td>Dr Benjamin Knapp (Co-Chair)</td>
<td>Sonic Arts Research Centre</td>
<td>UK</td>
</tr>
<tr>
<td>Volker Köhn</td>
<td>Saxon State, Ministry of Social Affairs and Consumer Protection</td>
<td>Saxony/Germany</td>
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<td>Hungary</td>
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<td>Hungary</td>
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<td>College of Computer Science &amp; Information systems, Jazan University</td>
<td>Malaysia</td>
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<td>Assoc Prof. Dr Roslina Othman</td>
<td>College of Computer Science &amp; Information Systems, Jazan University, Jazan</td>
<td>Malaysia</td>
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<tr>
<td>Paul Panek</td>
<td>TU Vienna &amp; Ceit Raltec</td>
<td>Austria</td>
</tr>
<tr>
<td>Dr Maria Raquel Patricio</td>
<td>Institute Polytechnic of Braganca</td>
<td>Portugal</td>
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<td>Dr Gabriel Prada</td>
<td>Ministry of Health and Family</td>
<td>Romania</td>
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<tr>
<td>Mr Michel Tuchman</td>
<td>CNAV</td>
<td>France</td>
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<tr>
<td>Benjamin Wimmer</td>
<td>CURE - Centre for Usability Research and Engineering</td>
<td>Austria</td>
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<tr>
<td>Prof. Dr Wolfgang Zagler (Chair)</td>
<td>Rehabilitation Technology, Vienna University of Technology</td>
<td>Austria</td>
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**B: What forms of multidisciplinary collaboration will maximise the development of new technologies in this field?**

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<tr>
<th>Name</th>
<th>Organisation</th>
<th>Country</th>
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<tbody>
<tr>
<td>Professor Rossitsa Chobanova</td>
<td>Bulgarian Academy of Sciences</td>
<td>Bulgaria</td>
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<tr>
<td>Professor Mihail Coculescu</td>
<td>The Ministry of Health and Family</td>
<td>Romania</td>
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<tr>
<td>Dr Aaron Cohen</td>
<td>Ministry of Health</td>
<td>Israel</td>
</tr>
<tr>
<td>Mr Peter Csato</td>
<td>GE Healthcare Hungry</td>
<td>Hungary</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>Professor Leela Damodaran</td>
<td>Department of Information Science, Loughborough University</td>
<td>UK</td>
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<tr>
<td>Dr Michele Goodhardt</td>
<td>INSERM</td>
<td>France</td>
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<tr>
<td>Ms Vera Kiss</td>
<td>EU Fundamental Rights Agency</td>
<td>Austria</td>
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<tr>
<td>Mrs Beatriz León Salas</td>
<td>Carlos III Institute of Health</td>
<td>Spain</td>
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<tr>
<td>Dr Günter Lepperdinger</td>
<td>Institute for Biomedical Ageing Research, Austrian Academy of Sciences</td>
<td>Austria</td>
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<tr>
<td>M. Philippe Metzenthin</td>
<td>MEDeTIC</td>
<td>France</td>
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<tr>
<td>Dr Roger O'Sullivan</td>
<td>Centre for Ageing Research &amp; Development in Ireland (CACDI)</td>
<td>Ireland</td>
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<tr>
<td>Dr Iris Rasooly</td>
<td>Israeli Ministry of Health</td>
<td>Israel</td>
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<tr>
<td>Dr Gert-Jan Van Der Putten</td>
<td>Radboud University Nijmegen, Medical Centre</td>
<td>The Netherlands</td>
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<tr>
<td>Mr Christian Wehrmann</td>
<td>VDI / VDE-IT</td>
<td>Germany</td>
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C: How much have EU-funded initiatives helped so far – what is still needed?

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Christina Bonora</td>
<td>Institute for Biomedical Ageing Research, Austrian Academy of Sciences</td>
<td>Austria</td>
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<tr>
<td>Professor Bojimir Davidov</td>
<td>Institute of Population &amp; Human Studies, Bulgarian Academy of Sciences</td>
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<tr>
<td>Gertraud Dayé</td>
<td>BIVA (Representation of interest of users of homes &amp; services in old age &amp; dependency)</td>
<td>Germany</td>
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<tr>
<td>Lars Ellensohn</td>
<td>CURE - Centre for Usability Research and Engineering</td>
<td>Austria</td>
</tr>
<tr>
<td>Mr Norman Fisch</td>
<td>Fonds National de la Recherché (FNR)</td>
<td>Luxembourg</td>
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<tr>
<td>Dr Hilde Hawlcek</td>
<td>Pensionistenverband Osterreichs</td>
<td>Austria</td>
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<tr>
<td>Ms Elena Leal González</td>
<td>Ministry of Science and Innovation</td>
<td>Spain</td>
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<tr>
<td>Professor Genoveva Mihova</td>
<td>Institute of Population &amp; Human Studies - Bulgarian Academy of Sciences</td>
<td>Bulgaria</td>
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<td>Assoc Prof. Dr Sarmite Mikulioniene</td>
<td>Mykolas Romeris University</td>
<td>Lithuania</td>
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<tr>
<td>Dr Dana Galieta Minca</td>
<td>Romanian Ministry of Health</td>
<td>Romania</td>
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<tr>
<td>Dr Anders Thulin</td>
<td>Country Council Region Skane</td>
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<tr>
<td>Dr Elena Urdaneta</td>
<td>INGEMA</td>
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<td>Mr Christian Wehrmann</td>
<td>VDI / VDE-IT</td>
<td>Germany</td>
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<tr>
<td>Ms Diane Whitehouse</td>
<td>The Castlegate Consultancy</td>
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<td>Dr Larry Willmore</td>
<td>IIASA</td>
<td>Austria</td>
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<tr>
<td>Dr. Gerda Geyer</td>
<td>FFG, AAL</td>
<td>Austria</td>
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<tr>
<td>Mr Loris Di Pietrantoni</td>
<td>European Commission</td>
<td>Belgium</td>
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Annex C: Speaker biographies

**Professor Alan Walker**  
The University of Sheffield

Dr Alan Walker is Professor of Social Policy and Social Gerontology at the University of Sheffield, UK. He has been researching and writing on aspects of ageing and social policy for over 30 years. He is currently Director of the New Dynamics of Ageing Programme (http://www.newdynamics.group.shef.ac.uk/) funded by the AHRC, BBSRC, EPSRC, ESRC and MRC, of the European Research Area in Ageing (http://www.shef.ac.uk/era-age/) and FUTURAGE (www.futurage.group.shef.ac.uk). Previously he directed the UK Growing Older Programme (http://www.shef.ac.uk/uni/projects/gop/index.htm) and the European Forum on Population Ageing (http://www.shef.ac.uk/ageingresearch). He also chaired the European Observatory on Ageing and Older People. He has published more than 20 books, 200 reports and 300 scientific papers. Recent books include Growing Older - Extending Quality Life (2004), Growing Older in Europe (2004) and Understanding Quality of Life in Old Age (2005) all published by McGraw Hill and Quality of Life in Old Age (2007), published by Springer. In 2007 he was given Lifetime Achievement Awards by both the Social Policy Association and the British Society of Gerontology.

**Mr Loris Di Pietrantonio**  
European Commission - DG Information Society and Media

Loris Di Pietrantonio is Policy Development Officer at the European Commission, DG Information Society and Media and is providing policy and coordination assistance to the Director in charge of the area "ICT addressing societal challenges". He has been in charge of the design of policies for digital inclusion, and addressing Europe’s ageing challenge. He has carried out a number of impact assessment studies in these domains and has contributed to the development of the European e-Inclusion Initiative in 2008. In 2004 he joined the European Commission with evaluation functions in the area of information society. From 2000 to 2004 he has been working in the business sector in the design of research and innovation strategies for sustainable transport industry. He is author of a number of publications in the area of research and industrial policy, electronic communications and transport and he occasionally lectures. He has an MA in European Economics from the College of Europe, Bruges Belgium, an MA on Energy Management from BI Norwegian
| **Mag. Dr. Gerda GEYER**  
Austrian Research Promotion Agency |
|---|
| May 2007 - present: Austrian Research Promotion Agency - Österreichische Forschungsförderungsgesellschaft mbH (FFG), Vienna  
Programme-Manager  
• Leader of the Austrian Thematic Programme benefit  
• National Contact Person for the Austrian Participation in the Ambient Assisted Living Joint Programme (AAL JP)  
2007-2009: Vice Chair of the Working Group Contents / AAL JP  
2009-2011: Member of the AAL Forum Committees  
Co-Editor of the AAL Proceedings 2009  
2010-2011: Chair of the Task Force of the Contents Working Group / AAL JP |

| **Dr. Ben Knapp**  
Queens University Belfast |
|---|
| Ben is a Senior Lecturer at the Sonic Arts Research Centre (www.sarc.qub.ac.uk) at Queens University Belfast (QUB). He is also a visiting senior research fellow at the Dundalk Institute of Technology (DkIT) Centre for Research on Ageing in Dundalk (www.netwellcentre.org), and a principal investigator for the CASALA project (www.casala.ie) exploring technology development for ambient assisted living. He was co-author and head of the executive committee of the EU FP7 CAPSIL support action (International Support of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living – www.capsil.org), with partners in the EU, Japan and the US. He recently served as a Fulbright Senior Specialist at University College, Dublin, and was a founding member and acting CTO of the TRIL Centre on Ageing (www.trilcentre.org) there. He currently is Principal Investigator and Coordinator of the EU FP7 BRAID (Bridging Research in Ageing and ICT Development www.braidproject.org) support action developing a roadmap for the European Union toward the future of ICT and ageing. He is also a partner on the Marie Curie Action, Value Ageing.  
Dr. Knapp’s research focuses on the use of physiological signals as a means for human-computer interaction and understanding the relationship between physiology, behaviour, and emotion. He has over 50 publications in areas |
ranging from sensor design to pattern recognition to user-centred design. Between 1999 and 2004, he was a principal at the consulting firm of Moto Development Group and co-founder of BioControl Systems, a Silicon Valley company focused on the development of mobile bioelectric measurement devices. Prior to that, he served as Professor and Chair of San Jose State University’s Department of Computer, Information and Systems Engineering. He has a Bachelor of Science degree in Electrical Engineering from North Carolina State University and a Master of Science and Ph.D. in Electrical Engineering from Stanford University.

Joan Cornet Prat  
Executive Chairman of the TicSalut Foundation

Joan Cornet Prat, born in Manresa in 1950. A Technical Engineer in Metallurgy, and graduate in Psychology. After working as a clinical psychologist in a General Hospital in 1979, he was elected mayor of Manresa. In 1988 he became a civil servant in the European Commission in Brussels and was later appointed Secretary General of the Socialist Group in the European Parliament in 1994. In June of 2004 he was appointed General Secretary of the Department of Health of the Government of Catalonia. In September 2005 the Government entrusted him to start up the “Bioregion of Catalonia” (Biotechnology) and since January 2007 he has been Executive Chairman of the TicSalut Foundation. He is also a Professor of the UOC (Catalunya Open University) and IL3 (International Long-Learning -University of Barcelona)  
www.ticsalut.cat

Dr. Monika Lechleitner  
Federal hospital Hochzirl

Medical doctor (University of Innsbruck) degree 1979  
Postgraduate training for internal medicine  
Intensive care, nephrology and diabetology  
Geriatric medicine  
Head of the Department of Internal Medicine and Geriatric Medicine  
Hospital Hochzirl (Anna Dengel-Haus) since 2005

Continuous research work (geriatric medicine, diabetology, cardiovascular risk)  
Past president of the Austrian Diabetes Association  
Past president of the Austrian Obesity Association
### Professor Leela Damodaran  
**Loughborough University**

Leela Damodaran is Professor of Participative Design and Change Management within the Research School of Informatics at Loughborough University where she leads the e-Society Research Group. The group focuses on human and social aspects of informatics and the impact of technology upon individuals, organizations and society. Leela has a long track record of successful applied research, specialising in the behavioural aspects of information and communications technologies (ICT’s). A significant part of her research is investigating digital inclusion/exclusion of older people, in particular identifying barriers to their uptake of ICTs, designing for social and digital inclusion, prolonging independent living through use of ICTs and citizen engagement/participation strategies. She is currently the Principal Investigator of ‘Sus-IT (Sustaining Information Technology use by older people to promote autonomy and independence)’

http://www.newdynamics.group.shef.ac.uk/sus-it.html, a 39-month collaborative research project which is part of the New Dynamics of Ageing (NDA) Programme funded jointly by all five UK research councils and led by ESRC. She is also a member of the KT-EQUAL consortium established specifically to exploit a decade of investment by EPSRC in ageing and disability research.

Leela engages with diverse stakeholder groups (eg policy-makers, developers and providers) of relevance to the design and provision of digital technologies (including assistive technologies), informing policy and design decisions relating to ICT products, systems and services to achieve a better match to the needs of all citizens – including those of older people. Leela has been a member of the Ofcom Strategic Advisory Board (OSAB) and its predecessor (the Spectrum Management Advisory Group) since its inception. She is also chair of the Digital Technologies and Social Inclusion (DTSI) consortium. Their report ‘Analogue to Digital Switchover: Human Aspects of Adoption’ provided the blue-print for current strategies for achieving digital switchover  
www.digitaltelevision.gov.uk. She presented the Mountbatten Memorial lecture 2010 in the IET Prestige lecture series which was entitled ‘Flying in Cyberspace: Can we all have wings?’  
February 2011
**Dr. Günter Lepperdinger**  
**Austrian Academy of Sciences**

Günter Lepperdinger was raised in Salzburg, Austria. He attended basic Genetics and Biology Courses at the University of Salzburg, graduated in Chemistry at the University of Vienna in 1991 and holds a doctoral degree in Biochemistry. He is molecular biologist and embryologist by training, and is an Adjunct Professor of Biochemistry at the University of Salzburg and an Adjunct Professor of Developmental Biology at the University of Innsbruck. He started his research career at the former Institute of Molecular Biology of the Austrian Academy of Sciences, worked at the Max Planck Institute for Biochemistry in Martinsried, at the National Institute for Child Health and Development, NIH Bethesda Maryland, and currently holds a position as a Principle Investigator and Section Head at the Institute for Biomedical Aging Research of the Austrian Academy of Sciences in Innsbruck, Austria. His research interests are stem cell biology in the context of the human aging and regeneration, and biochemistry of hyaluronan metabolism in development and pathology. He is a recipient of the Christian-Doppler-Award, the Best of Biotechnology Award, and the Werner-Welzig-Award. He is an APART fellow of the Austrian Academy of Sciences, Burgen Scholar of the Academia Europaeae and Elected Life-Time Member of the International Society for Hyaluronan Sciences. He served as an Associate Editor for 'Experimental Gerontology' - Elsevier, and is the Section Editor for Regenerative Medicine and Technology of 'Gerontology' - Karger, as well as Editorial Board Member of several international scientific journals. He is a Co-founder and Vice President of the Austrian Scientists and Scholars in North America - ASCINA.