# Progressive Standards around ICT for Active and Healthy Ageing

## Deliverable No. 8.1

## Report: Guidelines for Standards around ICT for AHA for Age Friendly Communities

V 2.3 Final

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## Document Control

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| **Abstract** | This report and guidelines give an overview about how different actors (representative organisations of older people, standardisation bodies, procurers) can be involved in development of actions (standards, policy, etc.) that support a better alignment of new technologies for older users. The document presents a set of relevant standards, offering also sections concerned with the education and employment of older users. Finally, there is a proposal for and audit tool that could be developed to facilitate the better procurement of products and services in relation to the needs and choices of older people. |
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## Revision History

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## Statement of Originality

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation, or both.

# 1. Executive Summary

Deliverable D8.1 provides guidelines for standards around ICT for AHA for Age Friendly Communities (including procurement) accompanied by a roadmap. The guidelines are aimed at:

(a) raising awareness;

(b) changing ways of thinking; and

(c) setting in place preconditions for change that will foster greater inclusion and co-production.

This report, in addressing information and communication technology (ICT) in relation to 'Active and Healthy Ageing' (AHA) focuses the presence and/or need for standards that can help maintain or enhance the quality of support for or accessibility of products or services for older users. In the background of this report are the ethical tenets adopted by the PROGRESSIVE project (D2.1) that are set out (with brief explanations) in Table 1 (see main text). These tenets are put forward with a view to their underpinning the thinking of those involved in the design or delivery of relevant products and services (or related standards)

The report is mainly aimed at standardisers (including standardisation bodies). These standardisers may be involved in standards development for particular topics, products or service areas (such as smart homes – addressed in D10.1). But the report is also relevant to where older people are simply part of the wider range of people (all ages) whose needs require to be addressed. This links, in particular, to the ethical tenets of 'Accessibility and Usability' and 'Inclusion, Non-Discrimination and social impact'.

Section 4, in recognising such tenets, affirms the importance of development of standards in ICT having older people's need in mind. This could relate to multiple fields or domains from computers to transport. Examples of (and guidelines relating to) relevant standards are given together with suggestions regarding ways to support the development of age-friendly initiatives. Inside this section there are references to the important theme of co-production that is addressed in D9.1 (see Section 4.1 in this report). In section 4.2 this report takes the WHO Flower derived matrix as its reference point. It points to challenges for older people in several areas; gives possible approaches/ideas for use cases; and offers recommendations / guidelines for standardisation bodies.

Section 5 refers to needs around procurement. Section 6 addresses issues relating to regards ICT issues pertaining to education and employment that impacts on older people – noting the part that coaching (in the sense of encouragement and facilitation) can play. Some recommendations are made. Section 7 offers a possible roadmap for standardisation activities in AHA field, with an outline description of an auditing tool that could support the same.

In conclusion, Section 8 offers a set of recommendations with guidelines that are important for standards around ICT for AHA. These are directed at both standardisation bodies and those concerned with the planning and development of communities that support AHA. Tasks undertaken that supported this deliverable are as follows:

- **Task 8.1 Researching Age Friendly Communities (EU and Internationally) [AGE/OU] M1-8.** This enabled an understanding of the context of age-friendly communities, their ethical underpinnings and some of the practical barriers that may thwart their development. It included the identification of relevant networks.
- **Task 8.2 Establishing the Position on Standards around ICT for AHA for Age Friendly Communities [UNINFO/DMU] M5-10.** This explored the role of standards within relevant initiatives. It identified, with the WHO flower as a reference point, issues relating to older people in a range of fields (e.g. home care, accessibility of ICT and software, accessibility and affordability of smart public transport).[1] It also appraised the extent to which standards were identified and were utilised alongside e.g. building regulations and strategic approaches to care and support services.
- **Task 8.3 Researching Issues for Coaching (and Procurement) around ICT for AHA for Age Friendly Communities [UNINFO/DMU] M9-13.** This included exploration European Commission funded initiatives, such as the Stop and Go project.[2] Also issues and approaches for education and outreach (including coaching) that impacts on older people's use of ICT (e.g. for the development of digital skills and the use of eHealth and related services).
- **Task 8.4 - Developing Guidelines for Standards around ICT for AHA for Age Friendly Communities (including Procurement) [UNINFO/DMU] M14-19.** This provided further underpinnings that have contributed to this report, enabling it to sit alongside the work of the WHO and other organisations that have set out measurable criteria for age-friendliness.

[1] For examples, see Deliverable 7.1 'WP7 Use Cases and Interoperability in the Context of Different Service Models'.

[2] www.stopandgoproject.eu

# 2. Introduction

The importance of ICT for Active and Healthy Ageing (AHA) is reflected in a growing range of strategic actions aimed at helping to ensure that older people can remain integrated in activities of everyday life. Some such activity has been prompted by the work of the World Health Organization (WHO)[3], but in a context where there is growing consciousness of the need (for social and economic reasons) to maintain or foster the greater inclusion and empowerment of older people.

The work of the WHO in this context has been to promote 'Age Friendly Cities and Communities' in order to 'facilitate the inclusion of older persons is to make our world more age-friendly … (enabling) people of all ages to actively participate in community activities' and where all are treated 'with respect, regardless of their age'.[4] It must be noted, however, that such activity is not just aimed towards the strategic level of thinking but is intended to facilitate translation into practical initiatives at the municipal level.

This report gives an overview of standards for age-friendly communities, their ethical underpinnings and notes some of the practical barriers that may thwart progress towards achieving the objectives of (inclusive) age-friendly environments (AFEs). It must be noted that in the background of this report are the ethical tenets adopted by the PROGRESSIVE project (D2.1). These are set out (with brief explanations) in Table below. The tenets underpin the thinking of those involved in the design or delivery of relevant products and services and, in many respects, echo the thinking and approaches that are integral to AFEs.

| |
|---|
| **Accessibility and Usability …** tenet is particularly relevant for buildings and the wider environment, products and services - therefore assistive technologies, universal design and 'age-friendly' community approaches. Links to aspects of equality, equity, and justice. |
| Affordability … tenet impacts on the 'accessibility' of products and services for people with limited means. |
| Autonomy and Empowerment … tenet reflects an imperative for products and services to be designed and configured in ways that engage with, afford choices, and facilitate greater control by older people in relation to key aspects of their lives. |
| **Beneficence and Non-Maleficence …** underpinning tenet in the context of many products or services. Relate to the way that risks of good or harm are assessed and addressed. |
| **Care, Protection and Support …** tenet is specifically relevant for products or services provided for or used by dependent, frail or otherwise vulnerable older people for whom care is needed. |
| **Equality, Equity and Justice …** tenet affirms the equal status and right of older people to access products and services. Each links to aspects of accessibility and affordability. |
| **Inclusion, Non-Discrimination and Social Impact …** tenet supports product and service approaches that challenge the disadvantage faced by older people through inappropriate and ageist practices and beliefs. |
| **Interoperability …** in terms of ICT, tenet embraces both technical and semantic interoperability for products and services. Wider consumer options and choices can follow. |
| **Privacy, Safety and Security** … tenet recognise the rights of older people in the contexts of 'traditional' ranges of products and services and the special considerations relating to ICT (e.g. for cybersecurity). |

[3] http://www.who.int/

[4] https://www.who.int/ageing/age-friendly-world/en/

**Table 1:** Ethical Tenets for ICT and 'Active and Healthy Ageing'

After examining issues such as co-production in the world of standards (this relates to D9.1) guidelines are provided that give pointers to different sets of actions. Finally, a draft audit tool (with relevant metrics and measurable criteria) is proposed that could be developed to facilitate the better procurement of products and services in relation to the needs and choices of older people.

## 2.1. Scope of Document

The scope of this document is to support the development of standards around ICT for AHA for age-friendly communities. It indicates that there is scope for some further standardisation in AHA fields supported through a process that includes co-production. The report, drawing on a growing knowledge of good practice and information from (potentially scaleable) 'local initiatives', offers guidance to assist:

- standardisers in understanding needs relating to AHA when they develop standards; and
- communities in relation to their involvement in (or promotion of) the development of new standards relating to AHA.

## 2.2. List of Abbreviations

| | |
|---|---|
| AAL | Ambient Assisted Living |
| ACAS | Advisory, Conciliation and Arbitration Service |
| AFCC | Age-Friendly Cities and Communities |
| AFE | Age Friendly Environments |
| AFEE | Age Friendly Environments in Europe |
| AGE | AGE Platform Europe (PROGRESSIVE Partner) |
| AHA | Active and Healthy Ageing |
| CEN | European Committee for Standardization |
| CEN/CLC | CEN / CENELEC |
| CENELEC | European Committee for Electrotechnical Standardization |
| CRPD | Committee on the Rights of Persons with Disabilities |
| CSA | Standard (CSA Group) |
| DMU | De Montfort University (PROGRESSIVE Partner) |
| EG | Guide (referred to ETSI) |
| EHTEL | European Health Telematics Association (PROGRESSIVE Partner) |
| EIP | European Innovation Partnership |
| EN | European Norm |
| ES | Standard (referred to ETSI) |
| ETSI | European Telecommunications Standards Institute |
| EU | European Union |
| GPS | Global Positioning System |
| H2020 | Horizon 2020 (European Project) |
| HBES | Home and Building Electronic Systems |
| HF | Human Factors |
| ICT | Information and Communication Technology |
| ICT for AHA | Information and Communication Technology for Active and Healthy Ageing |

| | |
|---|---|
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IGPA | Intergenerational Physical Activity |
| IOT | Internet of Things |
| ISO | International Standardisation Organisation |
| IT | Information Technology |
| IWA | International Workshop Agreement (international pre-standard) |
| JIS | Japanese Industrial Standards |
| NGO | Non-governmental Organisations |
| OU | The Open University (PROGRESSIVE Partner) |
| PC | Personal Computer |
| PNE | Spain Standard (now UNE) |
| prEN | Draft European Standard |
| PRM | Persons with Reduced Mobility |
| RRI | Responsible Research and Innovation |
| RTLS | Real-time Location Systems |
| SME | Small and Medium-sized Enterprises |
| TI-VIP | Traveller information for visually impaired people |
| TR | Technical Report (referred to norms) |
| UK | United Kingdom |
| UNE | UNE - Asociación Española de Normalización |
| UNINFO | UNI - Ente federato per Informatica (PROGRESSIVE Partner) |
| USA | United States of America |
| VDTs | Visual Display Terminals |
| W3C | World Wide Web Consortium |
| WCAG | Web Content Accessibility Guidelines |
| WHO | World Health Organisation |
| WP | Working Package. H2020 way of dividing into different categories of work |

## 2.3. Glossary

**Audit.** A formal examination of an organisation's products and/or services.

**Co-production.** Working in partnership with users in the generation of ideas, decision making and development of a standard for a product or service.[5]

**Deliverable.** Additional outputs that must be produced at a given moment during the action.[6]

**Impact fields.** Areas that are destination of specific actions.

**Interoperability.** Interoperability is the ability of a system or a product to work with other systems or products without special effort on the part of the customers.

**Standard bodies.** A standards organisation, standards body, standards developing organisation (SDO), or standards setting organisation (SSO) is an organization whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise producing (technical) standards that are intended to address the needs of a group of affected adopters.

Note. For more key terms and phrases, see ‘Deliverable 1.3. Key Terms and Phrases’.

[5] Co-production is about more than good participation and/or engagement. It is a value-led approach which is characterised by inclusive processes and a range of participatory activities that bring together different voices and perspectives on a common issue or problem – a shared agenda – to achieve positive change at different levels. [Source: NDTI (2013) ‘Co-production Involving and Led by Older People - an Evidence and Practice Review]

[6] Source: http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/deliverables_en.htm

# 3. Guidelines Context

By 2050, the world's population aged 60 years and older is expected to double to nearly 2 billion people, 80% of whom will live in low- and middle-income countries. The health of older people is unfortunately not keeping up with increasing longevity. The World Health Organization has highlights great diversity in health and functioning, and the marked health inequities, in older age.[7] There is little evidence to suggest that people today are experiencing older age in better health than did previous generations.

The EU Rolling Plan on ICT Standardisation provides an overview of the needs for preliminary or complementary ICT standardisation activities to be undertaken in support of EU policy activities.[8] It is prepared annually by the European Commission in collaboration with the European Multi-Stakeholder Platform (MSP) on ICT Standardisation and lists all the topics identified as EU policy priorities where standardisation, standards or ICT technical specifications ought to play a key role in the implementation of the policy. It covers technologies of 'horizontal importance' (i.e. technologies whose application has a wide impact across different fields) in the context of ICT infrastructures and ICT standardisation. The Rolling Plan includes a section on societal challenges and ageing.

The scope of this report D8.1 is to develop specific guidelines that help standards bodies to:

- understand the needs and appreciate the significance of ICT in the lives of older people;
- inform their approach to developing or reviewing applicable standards (that have an ICT element); and
- ensure, wherever appropriate, that older people or their representative bodies are engaged in the process of standards development or review.

This activity is informed by fields contained in the WHO flower derived matrix.[9]

The guidelines within the report offer pointers to the role that different stakeholders can play regarding the procurement of 'ICT-related' age-friendly products and services; and, where appropriate, related approaches to coaching older people about their access to or use of such services. Other stakeholders include community organisations, employers (for public and private sectors), and the third sector (voluntary services, charities, etc.), insurers, and organisations working in different fields such as housing, transport, safety and security).

[7] http://www.who.int/bulletin/volumes/94/10/16-184960/en/

[8] https://ec.europa.eu/digital-single-market/en/rolling-plan-ict-standardisation

[9] https://drive.google.com/open?id=1Be0vIEJGB1K0lV9_mJwiseyQA53WAl-Ttda_F0tEHzs

# 4. Development of Standards in ICT with Older People's Needs in Mind

There are barriers to the development or implementation of ICT solutions to some of the challenges relating to AHA. These barriers include the fragmentation of markets, a lack of interoperability, technology push instead of user pull, lack of appropriate business models, shortcomings in governance frameworks and policies, and issues relating to procurement. Such barriers create a kind of vicious circle. Having a limited number of interoperable solutions means no critical mass which, in turn, means no need for standards. It also potentially means higher prices and vendor 'lock in' – such matters relating to several of the PROGRESSIVE ethical tenets (including 'Interoperability'). At same time, there are many reasons why standards may be needed (e.g. to ensure safety and to ensure that products and services properly take account of consumer needs and choices).

Standards are not, therefore, only about interoperability. Nor are they solely to respond to the 'technological push' that might be evident from among the stakeholders that are often involved in the standardisation process. But, from both perspectives, there is a rationale for introducing interoperability – so that market development is facilitated *and* consumers (in our case older people) can get a better 'deal' in terms of choice and the accessibility of products and services to them. Such matters arguably carry extra importance for older people because of their significance in facilitating AHA (with products and services in many cases having the potential to empower people through their use of technologies, access to information, employment opportunities, transport, etc.) in ways that might otherwise not be possible.

There are various levels of interoperability.[10] At a basic level of interoperability, elements exist without adversely interfering with their mutual, intended function. At the highest level of interoperability, elements can communicate with each other and use the information that they exchange (D7.2 on Interoperability Frameworks applies).

## 4.1. Importance of Co-production in ICT for AHA

Research undertaken within the PROGRESSIVE project has identified good practices in user co-production strategies and methodologies. Early findings from this research were shared with relevant stakeholders outside the consortium for consultation and review. The outcomes of that initial work highlighted the need to focus on the objectives, processes, and methods used in co-production with users and older people. It led to the publication of a PROGRESSIVE guide on co-production (D9.1). This guide, in the format of a CEN guide, makes the insights gathered specifically relevant for standardisation in ICT for AHA.

Co-production is, of course, closely linked to inclusion. In standardisation, inclusiveness – that is, the participation of a wide range of stakeholders – is important to improve the quality of standards and legitimise the outcome of the standardisation process.

It is notable, in addition, that according to the ISO principles, national standardisation bodies should be committed to informing and seeking input from a broad range of relevant national stakeholders on any new standardisation project when they are proposed. The

[10] https://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/interoperability.pdf

standardisation committee, its leaders and members are required to achieve the best possible representation and endeavour to ensure that all stakeholder interests are appropriately considered when reaching a consensus decision. This links both to ethical tenets adopted by the project (see Table 1) and to the European Commission principles that relate to Responsible Research and Innovation (RRI) which have been a reference point in much of PROGRESSIVE's work.[11] ISO 26000 provides the broader 'backdrop' of social responsibility. It offers seven 'core subjects' that contribute to what is considered good governance (see Figure 1). These include community involvement and development.


**Figure 1:** Social Responsibility: Seven Core Subjects (ISO)[12]

While appropriate representation of a wide range of stakeholders in standardisation activities is a desirable goal, it may be difficult to achieve. This may be particularly the case for older people – especially where they are vulnerable, socially isolated or otherwise disadvantaged (e.g. by mobility or sensory impairments). Despite all good faith efforts to achieve balance, not all parties will, therefore, have the resources or priorities to become involved – hence often the reliance on representative bodies or, in the context of European standards developed through CEN, CENELEC and ETSI, through Annex 3 bodies.[13] Several publications from outside and from within the European standardisation system, such as the European Commission publication Joint Initiative on Standardisation and the CEN

[11] See Wilford S, Fisk M and Stahl B (2016) 'Guidelines for Responsible Research and Innovation' The GREAT Project, De Montfort University, Leicester.

[12] See https://www.iso.org/publication/PUB100259.html

[13] Annex 3 bodies utilise 'expert advisors' to ensure a more balanced range of stakeholder inputs in the standardisation process. Four such bodies operate viz. Small Business Standards, ANEC – The European Consumer Voice on Standardisation; and ECOS - The Environmental Citizens' Organisation for Standardisation; ETUC – European Trade Union Confederation.

publication ‘Civil Society’ acknowledge the need to improve the inclusiveness of standardisation work.[14]

As noted earlier, PROGRESSIVE developed a guide (D9.1) for standardisation work to introduce, develop, and validate a framework for user co-production practices. This recognises the important role of organisations at the EU level (such as the Annex 3 bodies noted above) but it encourages standardisers to go further by encouraging, wherever appropriate, the representation (indeed, the *participation*) of civil society stakeholders within national standardisation committees. It signals the importance of reaching out to underrepresented user groups (among which many older people can be counted) and to solicit their opinion on relevant questions. The D9.1 guide puts forward a range of participatory methodologies that can help with this and advises as to when and how to they can be used. Co-production is, of course, a manifestation of ‘wider’ stakeholder involvement. It provides several benefits to standardisation. For example, it:

- brings fresh thinking and new value to standardisation committees (fostering teamwork and collaboration);
- helps those concerned with product development and service provision to understand future market needs and possibilities, and to identify and mitigate risks; and
- can improve the relevance and legitimacy of the eventual standard.

The guide (D9.1) does not suggest any ‘model’ procedure for user co-production process for standardisation. Rather, it proposes that each standardiser or standards developer may define a strategy and activities based on its needs and resources. The choice of participatory methodology depends on the questions end users want to ask and the stage of standardisation process. Table 2 (drawn from D9.1) pertains.

| Stage of Standard Development Methodology | Define or Review Standards Project | Drafting Standard | Enquiry on Draft Standard | Publication |
|---|---|---|---|---|
| Persona | X | X | X | |
| Focus group discussion | X | X | | |
| Problem tree analysis | X | X | | |
| Photoscan | X | X | | |
| Customer journey | X | X | X | |
| Storyboard | | X | X | |
| Gamestorming Workshop | X | X | | |
| Gaming | | X | X | X |
| Users/citizen panel | X | X | X | |
| Delphi survey | X | X | X | |

**Table 2:** Suggestions for Methodologies for the Different Stages of Standardisation

[14] COM(2018) 686 Final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions The Annual Union Work Programme for European Standardisation for 2019. Chapter 4.2.

http://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-686-F1-EN-MAIN-PART-1.PDF

## 4.2. Older Users and ICT: Impact Fields

The World Health Organization (WHO) Age-Friendly Cities and Communities (AFCC) programme, noted earlier, is a global movement aiming to improve the experiences of older people living in cities and communities around the world. The approach focuses on features of a city's or community's, environment, services and policies that impact on the inclusion and involvement of older people. The features which impact on 'age- friendliness' are presented in eight 'domains' as petals of a flower, at the centre of which an individual experience the city or community as more (or less) age-friendly (Figure 2).

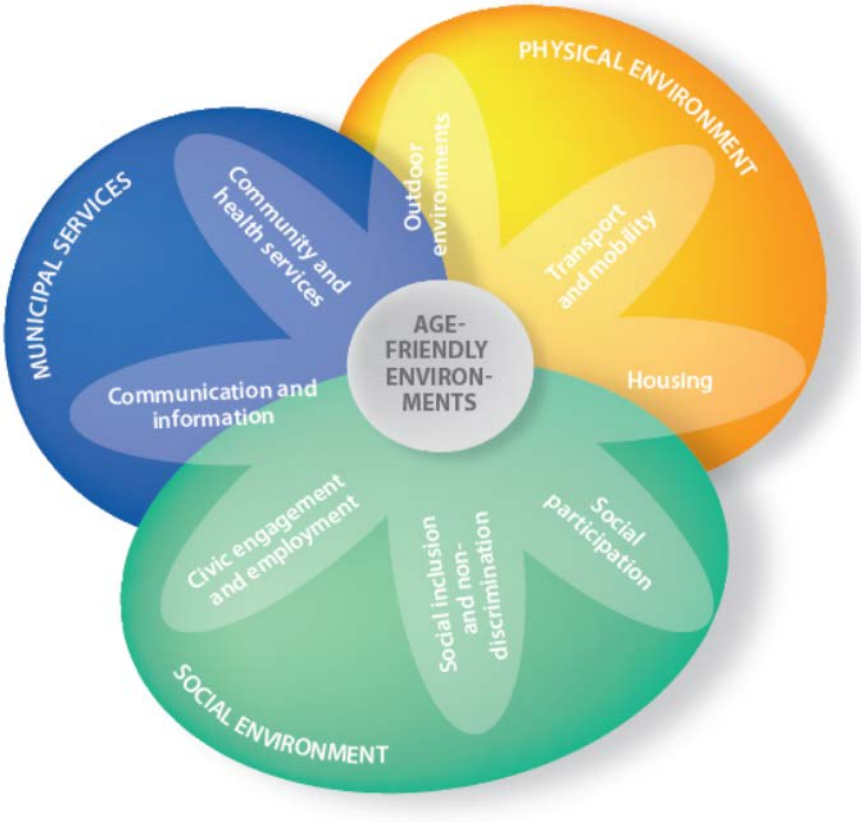


**Figure 2:** Age-friendly 'Flower' (WHO)

Since each domain (petal) encompasses a wide range of factors, the WHO flower indicates that each of these determinants can be variously and simultaneously involved in making a city or community more or less age-friendly. In a similar vein, the WHO concept of active ageing suggests that the potential for age-friendliness is defined by the ability of older people, to individually and collectively, either influence or control factors that may impact on their experience (for some or all of the factors across the domains).

Drawing on the 2012 European Year of Active Ageing and Intergenerational Solidarity, three additional fields for AHA application were identified for consideration in combination with the WHO Flower:

- Employment
- Participation in society
- Independent living.

In Task 8.2, based on work in PROGRESSIVE's WP7, it can be seen how these three important fields are related to the WHO flower domains through the creation of a matrix that that assists the mapping of actual standards, guidelines and/or initiatives in support of AHA. This is provided below as Table 3.

| | A. Employment | B. Participation in Society | C. Independent Living |
|---|---|---|---|
| **1. Homes and Buildings** | 1A. Age-friendly workspaces | 1B. Accessibility and usability of public building | 1C. Accessibility and usability of dwellings (including home automation) |
| **2. Social Participation** | 2A. Mentoring | 2B. Leisure activities and intergenerational activities | 2C. Assistive technologies |
| **3. Respect and Social Inclusion** | 3A. Diversity charters (specific human resource policies and initiatives for older workers) | 3B. Volunteering | 3C. Social inclusion initiatives |
| **4. Civic Participation** | 4A. Vocational training and policies on work-life balance | 4B. eGovernment and participatory democracy | 4C. Lifelong learning |
| **5. Communication and Information** | 5A. Computer training / Digital literacy | 5B. Accessibility of IT devices in community facilities | 5C. Accessibility of IT and software |
| **6. Community support and Health Services** | 6A. Occupation safety and health policies / services | 6B. Community care services and motivational coaching | 6C. Home care (health and social care) and remote health monitoring |
| **7. Outdoor space and Built Environment** | 7A. Safe routes and accessibility of buildings | 7B. Emergency services in outdoor spaces | 7C. Geolocalisation devices |
| **8. Transport** | 8A. Transport-solutions to serve economic centres (public transport, car sharing, …), and remote and flexible working | 8B. Accessibility and affordability of public transport | 8C. Personalised transportation solutions |

**Table 3:** Matrix for Classifying Use Cases based on an extended Age-friendly 'Flower'

Using this mapping, in Task 8.2 relevant standards were identified for the fields in question. This has helped in determining the extent of 'coverage' of standards in relation to those fields that may be considered for older people in the context of age-friendly cities and communities.

In this section, we list eight sets of issues for older people in specific fields, with possible approaches/ideas and recommendations for standards bodies. The content of these strongly echoes some of the ethical tenets noted in Table 1. The list starts with challenges in the field of homes and buildings and ends with transport.

### 4.2.1. Homes and Buildings

Access to buildings is a physical experience that impacts the everyday life of every person. The use of ICT has within the homes of or the buildings used by most people (of all ages) means that there is familiarity with using (or experiencing) technical devices like controlled or automated light switching, door opening, lift usage, television control, heating control, energy usage and security features.

In the field of homes and buildings, ICT, and related standards, will help AHA initiatives and activities to support people in at least three ways:

1. Work in age-friendly workplaces;
2. Access and use services inside public buildings; and
3. Support for independent living through an increase in the accessibility and usability of dwellings.

With regard to ICT, **age-friendly workplaces** can mean that older people can remain in work (or re-enter to world of work and/or benefit from education and training opportunities) because of wider availability and easier interaction with technology and its interfaces. For example, some technologies offer the option to regulate such matters as temperature, air quality, lighting as well as offering access to on-line services that may help with health advice, medication control, etc. It should be added that an objective of such initiatives is not just concerned with work and the *economic* benefits that this can bring but is also concerned with the *health* benefits that relate to (older) people's engagement and involvement.

With regard to ICT in the context of the **accessibility and usability of public buildings**, there is an imperative that requires they should be usable by a wide range of people including those who are older. For example, lifts need to be accessible by people with disabilities or impairments who may need various forms of support. That support may include Braille signage for people with sight loss, and audio information).

There are available standards about such matters. A useful checklist is available in 'Global Age-friendly Cities: a Guide' by the WHO.[15] In Germany, there is a fully-detailed guide about how to ensure the accessibility of buildings (which is applicable to both public and private buildings) that also refers to national and international standards.[16]

With regard to ICT in relation to the **accessibility and usability of dwellings** similar imperatives around accessibility and usability apply – meaning that not only should integral devices be present, but that the switches, buttons, instructions, etc. should be simple and

[15] http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf

[16] http://www.bmub.bund.de/fileadmin/Daten_BMU/Pools/Broschueren/barrierefreies_bauen_leitfaden_en_bf.pdf

readable. This includes for fire alarm or security systems where messaging carries especial importance.

There are clear links in the perspective taken here to 'smart homes' (D10.1 pertains) that can incorporate different sensors and automated devices that are often captured within the term the 'Internet of Things (IoT)'. Smart homes have emerged from a history that relates to 'intelligent homes' and 'intelligent cities', ideas and initiatives relating to which date from at least the 1950s. Smart homes and cities we can note were being seen as being relevant, not just from the point of view of energy control, but also helping the inclusion and engagement of older people from at least the early 1990s.[17] The IoT (relating to the networking of devices in the home) can be seen as subsumed within the concept of the smart home and, of course, linking to 'smart' communities. They may offer connectivity and automation for specific things like

- home security (intruder, water, gas and smoke alarms);
- personal safety (active or passive alarms activated in emergencies, such as falls, or other circumstances);
- easy management of the house (monitoring of internal temperature, air conditioning); and
- easy management of some functions (light control; windows, doors and shutter control; automation of height of working surfaces, cupboards in the kitchen, etc.).

It can be noted that there are sets of standards for the above that are usually conformed to by companies that develop and sell home automation products.[18]

An interesting example of networked neighbourhood living (called VWiQ) was demonstrated in Hamburg, Germany, in the middle of this decade.[19] It is included here because the initiative focused on people wanting to stay in their own homes. It received funding from the European Regional Development Fund and was noted in D7.1. The context is one where sixty thousand people in the city are considered to need some form of assistance or nursing care. VWiQ provides an appropriate 'use case' within PROGRESSIVE's wider range of use cases.

#### 4.2.1.1. Standards and Guidelines

*International Standards*

- ISO 21542:2011 - Building construction -- Accessibility and usability of the built environment.
- ISO 23599:2012 - Assistive products for blind and vision-impaired persons -- Tactile walking surface indicators.
- ISO/IEC 10779:2008 - Information technology -- Office equipment accessibility guidelines for elderly persons and persons with disabilities.

[17] Iki K (1992) 'Introduction of information Technologies for the Benefit of the Aged' in Morini A (Ed) 'Information Technologies for Buildings in a Changing Society' Proceedings of 1st Bilateral Workshop, Capri, Italy pp187-201.

[18] https://www.safewise.com/faq/home-automation/home-automation-operating-standards/

[19] http://www.vernetztes-wohnen-hh.de/

- ISO/IEC TR 19765:2007 - Information technology -- Survey of icons and symbols that provide access to functions and facilities to improve the use of information technology products by the elderly and persons with disabilities.
- ISO/IEC TR 19766:2007 - Information technology -- Guidelines for the design of icons and symbols accessible to all users, including the elderly and persons with disabilities.

*European Standards*

- CEN/TS 16118:2012 - Sheltered housing - Requirements for services for older people provided in a sheltered housing scheme.
- EN 301549:2018 - Accessibility requirements suitable for public procurement of ICT products and services in Europe.
- EN 50491 - General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS).
- EN ISO 9241-5 - Ergonomic requirements for office work with visual display terminals (VDTs) - Part 5: Workstation layout and postural requirements.
- ETSI EG 202 416:2006 - Human Factors (HF); User Interfaces; Setup procedure design guidelines for mobile terminals and services.
- ETSI ES 202 432: 2006 - Human Factors (HF); Access symbols for use with video content and ICT devices.
- A full list of standards for house automation: https://ec.europa.eu/eip/ageing/standards/home/domotics-and-home-automation_en
- A full list of standard for sensors, actuators and alarms: https://ec.europa.eu/eip/ageing/standards/home/sensors%2C-actuators-and-alarms_en

*National Standards*

- CSA B651: 2012 - Accessible design for the built environment.
- UNE 41510:2001 - Accessibility in the urbanism.

*Guidelines*

- Measuring the Age-friendliness of Cities: A Guide to Using Core Indicators (2014). http://apps.who.int/iris/bitstream/10665/203830/1/9789241509695_eng.pdf

#### 4.2.1.2. Note

Strategic and provider organisations should become more aware of the opportunity to use standards that are already available (listed in Section 4) for homes and buildings. Many IoT devices can be integrated within homes and buildings subject to certain conditions being met (e.g. around interoperability). There is, furthermore, the requirement for strong cyber-security measures to be in place.

### 4.2.2. Social Participation

The field of social participation is particularly important in order to address the risk of exclusion of some older people. It relates, in particular, to the PROGRESSIVE ethical tenet of that embraces inclusion. In the field of social participation, ICT will help AHA initiatives and activities to support people in at least three ways:

1. Activities like coaching and mentoring;

2. Increasing intergenerational activities;
3. Helping with independent living through assistive technologies.

**Coaching and mentoring** can contribute to higher levels of awareness of the benefits of ICT among older people. In the workplace there is especial merit in older people themselves being engaged as coaches or mentors so that they can support younger employees. At same time, new (often younger) workers experience of ICT will enable *them* to help older people regarding such technologies.

In any case the digital platforms that are used for social participation (and for coaching and mentoring) should maximise accessibility (e.g. intranet, corporate social networks, e-learning platforms). In this case, accessibility (a PROGRESSIVE tenet) does not only refer to conformance with accessibility requirements (e.g. EN 301549) but also easy interaction with technologies for anyone.

Regarding **intergenerational activities** there are opportunities for the involvement of older users to harness ICT for entertainment or leisure (e.g. gaming) and for interactions with others including younger users (e.g. social networking). In the gaming arena there are many possibilities. For example, Sona is an interactive sound device that is specifically designed for outdoors – promoting dancing and movement. It is a creative ICT-based game, accessible to all regardless of disability or age (but used in care home settings), the winner of which is determined (using sensors) to be the most active participant.

With regard to the range of **assistive technologies**, massively growing options are available that can directly support an (older) person in daily activities – including through smart phones and apps. And there are many possibilities for people with very specific support needs (e.g. sight loss where multiple devices can play a part in communication or supporting the safe undertaking of other daily activities). The people concerned can interact with and/or access ICT products and services (e.g. through software that helps to zoom in on contents or that can read content). Some standards support the interoperability of these assistive technologies with ICT.

#### 4.2.2.1. Standards and Guidelines

*International Standards*

- ISO/IEC 10779:2008 - Information technology -- Office equipment accessibility guidelines for elderly persons and persons with disabilities.
- ISO/IEC 24751: 2008 - Information technology -- Individualized adaptability and accessibility in e-learning, education and training.
- ISO 23599:2012 - Assistive products for blind and vision-impaired persons -- Tactile walking surface indicators.
- ISO/IEC Guide 71:2014 - Guide for addressing accessibility in standards.
- ISO/IEC TR 19766:2007 - Information technology -- Guidelines for the design of icons and symbols accessible to all users, including the elderly and persons with disabilities.

*European Standards*

- CEN/TR 15913:2009 - Spectator facilities - Layout criteria for viewing area for spectators with special needs.

- CEN/CLC Guide 6:2014 - Guide for addressing accessibility in standards.
- EN 62489 - Electroacoustics - Audio-frequency induction loop systems for assisted hearing.
- EN 12182:2012 - Assistive products for persons with disability - General requirements and test methods.
- EN 12184:2014 - Electrically powered wheelchairs, scooters and their chargers - Requirements and test methods.
- EN ISO 9999:2011 - Assistive products for persons with disability - Classification and terminology.
- EN ISO 11334 - Assistive products for walking manipulated by one arm - Requirements and test methods.
- ETSI EG 202 191: 2003 - Human Factors (HF); Multimodal interaction, communication and navigation guidelines.

*Guidelines*

- CECOPS 2015 - Code of Practice for Disability Equipment, Wheelchair and Seating Services.
- *Generations Being Active Together: Guidelines for Intergenerational Physical Activity Programs.* Includes nine key guidelines to address in the design, implementation and evaluation of intergenerational physical activity programs. What is essential to all IGPA programs is that there is an opportunity for fun, safe and active participation by all. Also includes activity examples. http://lin.ca/sites/default/files/attachments/IGPA.pdf
- ZigBee Home Automation http://www.zigbee.org/zigbee-for-developers/applicationstandards/zigbeehomeautomation/

#### 4.2.2.2. Note

In terms of social participation, ICT can play a major role in facilitating inclusion. It also provides the medium by which coaching and intergenerational activities can take place – with older people as instigators and providers or recipients and beneficiaries.

### 4.2.3. Respect and Social Inclusion

Standards must operate on a basis of non-discrimination in all aspects of the lives on which they impact. Care must be taken in standards development, therefore, to ensure that they neither use inappropriate terminology nor become trapped by social constructs, designs or patterns of provision that fail to give fair and equal consideration to matters such as ethnicity, age or gender.

In relation to age this means not acknowledging chronological thresholds associated with ‘retirement’. It means not making generic assumptions about the status of older people e.g. as of lesser worth than others. It means not subscribing to beliefs that point to any *inevitable* incapacity of older people which may predispose them to be not in work, to be dependent or to be lacking in creativity, ICT knowledge or digital skills. It means not promoting regimes of care or support that preclude the active involvement of older people in respect of their choices and control of the same. Notable in relation to such approaches and, more particularly, with regard to the ‘language of standards’ is the recent establishment of a

working group examining 'Terminology' within the ISO Technical Committee TC314 on Ageing Societies.[20] This group will be providing initial guidance in 2019.

It follows that there is a challenge to standards developers to configure standards in ways that, through design approaches (for products and services including those of ICT or services founded on ICT and the terminology used) reflect respect, treats older people on a basis of equality, and maximises the potential for their inclusion. In this context ICT may help in relation to:

1. changing mindsets and promoting new approaches;
2. fostering understanding and collaboration between younger and older people (both in and out of the workplace, and including volunteers); and
3. promoting independent living through giving equal opportunity for older people to participate in economic and social life.

Of relevance in the ICT field are **diversity charters** that increase the use of ICT product and services whereby older people can interact together and with younger people. The European Commission recognises that such charters can contribute to fighting discrimination in the workplace and to promoting equality. There are, however, no standards or guidelines available in this field to promote inclusion in this way.[21]

In terms of practical action an example of good practice is offered by the MAN Diesel Company in Germany. MAN Diesel promotes integration as they have employees from 15 different nationalities, and the workforce is multi-generational - with over a third of the workforce aged 55 and above. MAN has offered employment to 'older' workers since 2009 and has retained eight employees above 61 years of age. This is because the company recognises that older workers are an important asset due to their wealth of experience and the diverse perspectives and skills that they have.

An initiative called 'Employers together for Integration' was launched in May 2017 at the European Business Summit 2017. This initiative aims at giving visibility to the work of employers that support integration of older workers and seeks to encourage more (older people) to join. Interested employers can currently join the initiative by filling in the form that is available on the website of the Directorate-General for Migration and Home Affairs.[22] Similar approaches are relevant to **volunteers**.

**Social inclusion initiatives** can, furthermore, involve activities aimed at encouraging older people to use (digital) social networks. A project in this field is 'Goldenworkers - ICT for promoting active ageing at work'.[23] The main goal of this EU funded project was to identify emerging technologies in the context of new models that could extend professional active life. It explored novel applications in the area of ICT for active ageing at work with it being

[20] https://www.iso.org/committee/6810883.html

[21] http://ec.europa.eu/justice/discrimination/diversity/charters/index_en.htm

[22] https://ec.europa.eu/eusurvey/runner/employersforintegration

[23] http://age-platform.eu/project/goldenworkers-ict-promoting-active-ageing-work

intended that these would ultimately lead to the definition of a beyond-the state-of-the-art research agenda, that would be embraced by both research and practice communities.

Furthermore, given that much of the working world requires some element of digital literacy, it is unsurprising that a number of initiatives focus on supporting the development of such skills for older people. An example (on a large scale) is the 'Nonni su internet' project in Italy where young people with ICT skills, under the supervision of an expert ICT teacher, teach older learners (aged over 60) a range of digital skills.[24] The ideal tutor/learner ratio is indicated as 1/2.

A further community-based example is the 'Digital Senior' scheme launched in 2017 by the Norwegian Red Cross.[25] It involves 11 towns across the country and offers 10-week (2 day a week) courses (in social settings) giving 1:1 tuition. 'Follow ups' are encouraged at home or in local cafés. Over 400 older people (aged 54 upwards), with the benefit of tablet devices, have participated.

With such initiatives in mind, good information about them is important including how older people access them. This means that, on one hand, the developers of activities need to promote an accessible environment, and, on the other hand, older people need have an adequate level of literacy, with enough equipment (e.g. by using specific devices). Any standards relating to the same need to consider this and recognise the challenge that such access can represent for more dependent or disabled older people.

#### 4.2.3.1. Standards and Guidelines

*International Standards*

- ISO 23599:2012 - Assistive products for blind and vision-impaired persons -- Tactile walking surface indicators.

*European Standards*

- CEN/TR 15913:2009 - Spectator facilities - Layout criteria for viewing area for spectators with special needs.
- EN 301549:2015 - Accessibility requirements suitable for public procurement of ICT products and services in Europe.
- ETSI EG 202 132: 2004 - Human Factors (HF); User Interfaces; Guidelines for generic user interface elements for mobile terminals and services.

*Guidelines*

- Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006H0962

Note: there are no standards identified regarding diversity charters.

[24] http://www.mondodigitale.org/en/what-we-do/areas-intervention/active-aging/nonni-su-internet-0

[25] http://rodekors.no/digital-senior

#### 4.2.3.2. Note

In respect of respect and social inclusion, ICT is important and related standards must use appropriate, non-discriminatory terminology and be appropriately configured. Interesting initiatives have been noted. There are no specific standards in this field.

### 4.2.4. Civic Participation

Web and mobile technologies can now be the basis for the active participation of citizens in civic society. eGovernment gives greater access to information and services without the need to enter public buildings. These ICT tools, if properly configured, can be of great help to older people. The digital transformation of government is, in fact, a key element of the Single Market, helping to remove digital barriers and preventing further fragmentation taking place as the modernisation of public administrations takes place.

In the field of civic participation ICT will help AHA initiatives and activities to support or engage (older) people in at least three ways:

1. Work environment (vocational training and policy on work-life balance);[26]
2. Democracy (eGovernment and participatory democracy); and
3. Education (lifelong learning).

In ICT field relating to **vocational training and policy on work-life balance**, there is the imperative around digital literacy that applies to people of all ages. It may be especially important for older people wishing to stay in work or to re-join the workforce. At the same time, this means that employers need to play their part in supporting older people to develop their digital competences and otherwise facilitate their employment.

Initiatives around **eGovernment and participatory democracy** should, it is considered, be both geared towards and endeavour to involve older people - promote their understanding of the potential benefits of interacting with government using ICT. This means attention being given to the design of ICT products, for example, through Web sites.

It is relevant in this context that the European Union eGovernment Action Plan 2016-2020 aims to modernise public administration - to promote a digital internal market that engages more with citizens and businesses in order to deliver high quality services.[27] Through the joint efforts between Member States and the Commission, the Plan seeks to promote the availability and take-up of eGovernment services in user-oriented (and low cost) ways. Such matters whilst relevant to all may have particular benefits for older people who are disproportionately high users of some government services.

ICT provides a major opportunity in relation to **lifelong learning**. An approach is being developed by the European Union that seeks to embed a positive attitude towards lifelong learning and to render as obsolete any idea that education or training ends as soon as someone leaves school or college. One objective relates to the need for (adults including) older people to be able to interact with new technologies (e.g. through e-learning, webinars,

[26] Training that emphasizes skills and knowledge required for a particular job function (such as typing or data entry) or a trade (such as carpentry or welding).

[27] https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020

and social media fora). This culture change (i.e. with greater emphasis on lifelong learning) will be reflected in the content of the European Union's new Strategy for Education and Training (envisaged as being released later in 2019).[28]

#### 4.2.4.1. Standards and Guidelines

*International Standards*

- ISO/IEC 24751: 2008 - Information technology -- Individualized adaptability and accessibility in e-learning, education and training.
- ISO/IEC 40500:2012 - Information technology -- W3C Web Content Accessibility Guidelines (WCAG) 2.0.

*European Standards*

- EN 301549:2018 - Accessibility requirements suitable for public procurement of ICT products and services in Europe.

*Guidelines*

- *An Ageing Workforce: The Employer's Perspective* (Helen Barnes, Deborah Smeaton, Rebecca Taylor) – 2009 - Institute for Employment Studies. http://www.nuffieldfoundation.org/ageing-workforce-employers-perspective
- European eGovernment Action Plan 2016-2020 https://ec.europa.eu/digital-single-market/en/european-egovernment-action-plan-2016-2020
- Example of Work-life balance policy. http://www.ucl.ac.uk/hr/docs/work-life-balance-policy.pdf

#### 4.2.4.2. Note

Standards around ICT for AHA must take account of the need not just to foster inclusiveness but also recognise that one of the preconditions relates to digital literacy. Linked with this is older people's willingness, where necessary, to learn or enhance their digital skills within a context where lifelong learning is promoted. Other imperatives have been noted as relating to the design of products (and services) and their accessibility through e.g. appropriately configured ICT tools.

### 4.2.5. Communication and Information

With ICT in the context of AHA being the main focus for the PROGRESSIVE project it follows that there is a clear view of the need to maximise the usability and accessibility of the technical tools concerned. The ethical tenet of 'Accessibility and Usability' is paramount. Every ICT should, therefore, be easily operable – even for those without digital skills. One potential consequence of not having devices that are easily operable is increased exclusion – this working counter to another of the ethical tenets – that relating to 'Inclusion'.

In the field of communication and information, ICT will help AHA initiatives and activities to support people in at least three ways:

[28] The link to the current strategy pertains here. No information as yet regarding the new (emergent) strategy is yet available. See https://ec.europa.eu/education/policies/european-policy-cooperation/et2020-framework_en

- Computer training and digital literacy;
- Supporting accessibility of IT devices in community facilities and elsewhere; and
- Configuring ICT and software in appropriate ways.

With regard to **computer training and digital literacy** it is essential that older people, where applicable, are supported in developing their digital skills. And even for those people with physical, sensory or cognitive impairments, there is real potential for ICT to be designed in ways that offer user-friendly interfaces (hardware and software) and give more support (e.g. step by step guides) to users.

In this context it is considered that standardisation bodies should support the inclusion, within standards, of guidelines and frameworks that define knowledge, competence and skill sets that are required. An example is the DigComp 2.1 framework, that identifies the key areas of digital competence as below. They are set at too high a level for 'minimum' requirements – this needing to be born in mind when initiatives are configured to increase digital literacy from a low base. The categories in the DigComp 2.1 framework are, however, valid. These require that people at a good level of competence, in respect of the following, need to:[29]

1. **Information and data literacy:** … articulate information needs, to locate and retrieve digital data, information and content; to judge the relevance of the source and its content; to store, manage, and organise digital data, information and content.
2. **Communication and collaboration:** … interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity; to participate in society through public and private digital services and participatory citizenship; and to manage one's digital identity and reputation.
3. **Digital content creation:** … create and edit digital content; to improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied; and to know how to give understandable instructions for a computer system.
4. **Safety:** … protect devices, content, personal data and privacy in digital environments; to protect physical and psychological health; to be aware of digital technologies for social well-being and social inclusion; and to be aware of the environmental impact of digital technologies and their use.
5. **Problem solving:** … identify needs and problems, and to resolve conceptual problems and problem situations in digital environments; to use digital tools to innovate processes and products; and to keep up-to-date with the digital evolution.

The **accessibility of IT devices in community facilities** requires that older users with minimum digital skills should be able to interact easily with ICT. This links with requirements that relate to people with disabilities where 'reasonable accommodation' must be made to

[29] https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

ensure there is no unreasonable hardship.[30] Such accommodation can apply to various devices that are the source of public information and to automated teller machines (ATMs).

It is appropriate, therefore, that the **accessibility of IT and software** is maximised so as to ensure that most people are able to benefit from them. Some international standards and guidelines apply and are respected by many companies. This means, for example, that when a customer buys a personal computer (PC), the hardware and operating systems will normally be accessible and offer features that can be adjusted to individual needs or preferences. This helps may older users (e.g., font resizing, colour contrast, flexible audio volume).

When designing technology for older people, seven key issues can be addressed as follows:[31]

1. **Vision and Hearing.** The need to take account of the fact that hearing and visual acuity (including that relating to colour) declines with age.
2. **Motor control.** Recognition that some older people perform better using touch interfaces rather than using a mouse.
3. **Device use.** Acknowledgment that most older people are not afraid to try new technology when they see a clear benefit. Older people are a notably large group of tablet users.
4. **Relationships.** Note being taken of the fact that because many older people are less mobile than others, digital technology has a special role to play (and can foster inclusion).
5. **Life stage.** Designs must not reflect thinking in terms of just younger users. Older people can be a sizeable part of the market for products.
6. **Experience with Technology.** The requirement not to make assumptions about what designers may take for granted among his/her peers.
7. **Cognition.** Accounting for variability requires attention to be given to designing in relation to the user's memory, attention and decision-making capacity.

#### 4.2.5.1. Standards and Guidelines

*International Standards*

- ISO 9241-171:2008 - Ergonomics of human-system interaction -- Part 171: Guidance on software accessibility.
- ISO 17069:2014 - Accessible design -- Consideration and assistive products for accessible meeting.
- ISO 19029:2016 Accessible design — Auditory guiding signals in public facilities.
- ISO/IEC 24751: 2008 - Information technology -- Individualized adaptability and accessibility in e-learning, education and training.
- ISO/IEC 29136:2012 - Information technology - User interfaces - Accessibility of personal computer hardware.

[30] http://ctb.ku.edu/en/table-of-contents/implement/physical-social-environment/housing-accessibility-disabilities/main

[31] https://www.smashingmagazine.com/2015/02/designing-digital-technology-for-the-elderly/

- ISO/IEC 40500:2012 - Information technology -- W3C Web Content Accessibility Guidelines (WCAG) 2.0.
- ISO/IEC TR 19765:2007 - Information technology -- Survey of icons and symbols that provide access to functions and facilities to improve the use of information technology products by the elderly and persons with disabilities.

*European Standards*

- EN 301549:2018 - Accessibility requirements suitable for public procurement of ICT products and services in Europe.
- EN ISO 14915-1:2002 - Software ergonomics for multimedia user interfaces.

*Guidelines*

- DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use (2017) - http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106281/web-digcomp2.1pdf_(online).pdf
- "Digital Literacy Training for Adults: Initiatives, Actors, Strategies" Guidelines concerning adult literacy teaching strategies for people aged over 55 http://www.geengee.eu/geengee/geengee-docs/contenuti/comune/G&G%20Research%20Report.pdf
- Guidelines for Public Access Terminals Accessibility - Irish National IT Accessibility Guidelines http://universaldesign.ie/technology-ict/irish-national-it-accessibility-guidelines/public-access-terminals/public-access-terminals.html
- JIS X 8341 - Guidelines for older persons and persons with disabilities -- Information and communications equipment, software and services.

#### 4.2.5.2. Note

Standardisation bodies can be hugely influential in prompting the design of products and their interfaces in ways that can increase accessibility and usability of the products and information about their use. By this means greater inclusion can be encouraged.

### 4.2.6. Community Support and Health Services

ICT is exceptionally relevant in the field of health services and community support. Notable are services (and the related technologies) that facilitate the remote monitoring of the health of (older) people, support their self-monitoring or offer them the means of accessing help when needed. Services like these, using ICT, carry the label of telehealth and telecare.[32] The broader context can be described as one concerned with 'digital health', with that element that is concerned with health data often referred to as eHealth. Where associated with a wider range of 'assistive technologies' that support independence, a further title

[32] See Doughty K (2018) 'From Red Buttons to Smart Technology Support' T-Cubed, Caernarfon. Also Fisk M, Sands G, Holliday N, Awang D, Ward G, Rose-Hayes E and Fielden S (2013) 'eAT in Social Care: Skills and Knowledge', Health Design and Technology Unit, Coventry University.

applies viz. Ambient Assisted Living (AAL).[33] The online repository of AALIANCE2 'Summary of Standards provides an overview of current standards in technology related to AAL.[34]

In the field of community support and health services ICT helps AHA and related digital health initiatives and activities to support people in at least three ways:

- Occupational safety and health policies/services;
- Community care services and motivational coaching;
- Home care and remote health monitoring.

With regard to **occupational safety and health policies/services** users of ICT require to follow norms and guidelines for the use of specific products (e.g. video terminals). With regard to older workers, their health and safety (as others) is of growing importance in Europe's ageing populations – as retirement ages continue to rise. The EU, it is suggested, could play a bigger role here by encouraging age management in enterprises, together with providing guidelines in this area.[35] The European Year for Active Ageing in 2012 provided an opportunity for raising awareness of the health and safety issues of older workers[36]. A good example of a tool to help companies be 'ready' to support a larger number of older workers has been developed by ACAS (the Arbitration, Conciliation and Advisory Service) in the UK.[37]

This report has noted that many older people have knowledge and skills that are useful in the workplace – this in itself justifying attention to the issue. It can also be noted that, because of their experience, older workers are at a lesser risk of non-fatal accidents, albeit that they are at a higher risk of fatal accidents than are younger workers. But recovery time and return to work after illness are key issues to address when aiming to increase the employment rate of ageing workers.

With regard to **community care services and motivational coaching**, these can be provided through technologies (telehealth, telecare, social alarms) in support of users, especially for older people. Such technologies are rapidly emerging in ways that increasingly 'fit' within the wider range of digital services associated with smart communities (D10.1 pertains). The ICT concerned is, in different EU countries, beginning to cross what is often a 'divide' between health and social care. An exemplary service is that provided by Dignio in Norway, part of which is trialling integrated services approaches (from a telecare 'base') in

[33] Note that the PROGRESSIVE project has been active in successive European Commission supported AAL fora – leading workshops at successive events in Coimbra (Portugal) in 2017 and Bilbao (Spain) in 2018. See www.progressivestandards.org.

[34] http://www.aaliance2.eu/AA2repository

[35] Age management is a term used for practices designed to promote a comprehensive approach to tackling demographic change in the workplace. Good practice approaches in age management have been defined as measures that 'combat age barriers and/or promote age diversity' (Walker 1999) and practices 'to ensure that all employees can reach their potential, without being disadvantaged by their age' (European Foundation 2006).

[36] http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/lsa/114968.pdf

[37] http://www.acas.org.uk/media/pdf/2/o/Acas-Age-Audit-Tool-User-Guide.pdf

different municipalities within Oslo.[38] Also exemplary is the programme of development of new service approaches (more from a telehealth 'base') that is evident in Scotland.[39] This carries the label 'technology-enabled care'.

A crucial point is that such services, now building on digital platforms, facilitate greater interaction with (and even between) older people. Hence instead of being a medium for instruction, advice or getting help and responding (to urgent situations), such services can be a medium for health (and related) coaching and facilitating older people's social inclusion and engagement – doing justice to the PROGRESSIVE tenets that relate to these (as well as facilitating 'Care').

Health coaching, which is also referred to as wellness coaching, can be noted as a goal-oriented process that facilitates healthy, sustainable behavioural change.[40] It draws on principles of positive psychology and the practices of motivational interviewing and goal setting.

In the field of **home care (health and social care) and remote monitoring**, ICT impacts in different ways that require varying levels of 'end-user' involvement. In summary it can include

- telehealth applications for home-based health management (that can link people and their families to their health care providers);
- telecare (social alarms, personal response services) to enable people to obtain help in the event of falls or other urgent circumstances;
- web-based communities (that link people and their families to health care providers, peers, and the community); and
- management of personal health records (that enable people to create and store their personal health information).

Passive monitoring and management (for which ICT implementation does not require training or operation by the end-user) can include:

- robotic applications (standalone applications that support home care needs such as medication prompts, including the use of artificial intelligence); and
- technologies that can be incorporated with 'smart homes' (in which ICT that is based on the use of sensors becomes part of the infrastructure).

In addition, with regard to monitoring, it is important to note that some ICT applications are being explored so that family members are able to monitor vulnerable (often older) relatives. Some ethical issues (including the PROGRESSIVE ethical tenet relating to 'Privacy'), of course, are relevant here and standards can play their part in ensuring that safeguards

[38] See www.dignio.com

[39] See http://www.jitscotland.org.uk/action-areas/telehealth-and-telecare/technology-enabled-care-programme/

[40] Starr, Julie (2008). The Coaching Manual: The Definitive Guide to the Process, Principles, and Skills of Personal Coaching (2nd Ed). Harlow, England: Pearson Prentice Hall. ISBN 0273713523. OCLC 172521676.

against the misuse of ICT used for monitoring (or the denial of choice or autonomy) are in place.[41] Specialised applications can be noted, furthermore, that are beginning to be used in care homes to monitor for and protect against abuse. Parameters for the use of such technologies have been set out.[42]

#### 4.2.6.1. Standards and Guidelines

*International Standards*

- ISO 9241-302:2008 - Ergonomics of human-system interaction -- Part 302: Terminology for electronic visual displays.
- ISO/TS 13131 - Health Informatics - Telehealth services - Quality planning guidelines.
- ISO 21091:2013 - Health informatics -- Directory services for healthcare providers, subjects of care and other entities.

*European Standards*

- EN 14485: Health informatics - Guidance for handling personal health data in international applications in the context of the EU data protection directive.
- IEC 60601 - Medical electrical equipment.

*National Standards*

- UNE 158401:2007. Servicios para la promoción de la autonomía personal. Gestión del servicio de teleasistencia. Requisitos.

*Guidelines*

- Code of Practice for Disability Equipment, Wheelchair and Seating Services (2015, CECOPS, UK). http://www.troubador.co.uk/book_info.asp?bookid=3270
- EUR 27072: 2015 - Mapping of effective technology-based services for independent living for older people at home. Deliverable 1. http://publications.jrc.ec.europa.eu/repository/bitstream/JRC91622/lfna27072enn.pdf
- International Code Of Practice for Telehealth Services (2017, Telehealth Quality Group, UK) https://www.telehealth.global/download/TELEHEALTH-CODE-OF-PRACTICE.pdf
- IWA 18:2016 Framework for integrated community-based life-long health and care services in aged societies.
- Occupational health and safety risks for the most vulnerable workers – European Parliament (2011) http://www.europarl.europa.eu/document/activities/cont/201108/20110829ATT25418/20110829ATT25418EN.pdf
- Qualité de Service en Téléassistance NF X50-520 (2013, AFNOR, France) https://www.boutique.afnor.org/norme/nf-x50-520/qualite-de-service-en-teleassistance/article/809420/fa180323

[41] "Active subjects of passive monitoring: responses to a passive monitoring system in low-income independent living" https://doi.org/10.1017/S0144686X15001269

[42] See https://www.nursingtimes.net/roles/older-people-nurses/the-ethics-of-using-cameras-in-care-homes/7003006.article

- Staying at Home: Requirements for Suppliers of Combined Services VDE AR E 2757-2 (2011, VDE, Germany) https://www.beuth.de/en/technical-rule/vde-ar-e-2757-2/143580669
- Supply Chain Quality Mark for Personal Alarm Services (2012, QAEH, Netherlands).

#### 4.2.6.2. Note

Standards are reasonably well developed in some areas that relate to care services at home, but challenges remain because of the changes that are taking place at the health and care 'interface'. This impacts on both products and services. Notable is the fact that a CEN Technical Committee (TC431) is developing a new standard for social alarms.[43] There is also an integrated framework for the provision of telehealth (including telecare) services available through the Telehealth Quality Group.[44]

### 4.2.7. Outdoor Space and Built Environment

Moving outside the home or the office can be difficult, especially for older people who may have mobility or orientation problems. With ICT support, their mobility can be made easier. With solutions like geo-localisation devices, it is increasingly possible to locate where a particular person is or to assist them with navigation / orientation (e.g. if that person misses the road home to their house, to reach the doctor or supermarket). This can be particularly relevant for people with dementia.

In the field of outdoor spaces and the built environment, therefore, ICT can help support AHA initiatives in at least three ways:

- Safe routes and accessibility buildings;
- Emergency services in outdoor spaces; and
- Support with geo-localisation.

With regard to **safe routes and the accessibility of buildings** ICT can support people through specific interactions (e.g. auditory support messages). More broadly, there are requirements for the accessibility of buildings and 'routes of travel' within buildings, also relating to entrances and the link to public spaces (footpaths, roads, parking areas). According to specific policies, in some countries when a building, or portion of a building, is required to be accessible or adaptable, an accessible route of travel shall be provided to all portions of the building, to accessible building entrances and between the building and the public way. Except within an individual dwelling unit, an accessible route of travel shall not pass through kitchens, storage rooms, restrooms, closets or other spaces used for similar purposes.

**Emergency services in outdoor spaces** are supported by ICT where alarms in different modes (auditory or visual) are provided. Some related infrastructures are concerned with communication in the event of security incidents (terrorism, major cyber-attacks) or natural

[43] See https://standards.cen.eu/dyn/www/f?p=204:7:0:::FSP_ORG_ID:1235177&cs=1EDA02E064C77C0A8FF4BB10C7AF88E28

[44] See www.telehealth.global

disasters (floods, volcanic eruptions, etc.) where some older people may be particularly vulnerable. The need for new architectures and technologies relating to these is a focus of EPSCO, the European Employment, Social Policy, Health and Consumer Affairs Council.[45]

With regard to **geo-localisation devices**, ICT can help to locate the precise positions of people and, as noted above, has particular relevance for 'missing' people (include people with dementia who may 'wander'). Different applications of such devices that are relevant for older people may emerge – with, potentially, a commensurate need for standards. For instance, a link can be made to the use of wearable sensors that is, in large part, promoted by mobile phone and wellness industries. These sensors enable location and movement to be gauged – with micro-electromechanical systems (MEMS) based sensors (accelerometers, gyroscopes, magnetometers, and physiological or biometric sensors) worn on different parts of the body, able to be used for identification of activities as walking, running and climbing upstairs, or the gathering of physiological measures.[46]

#### 4.2.7.1. Standards and Guidelines

*European Standards*

- CEN/TS 15209:2008 - Tactile paving surface indicators produced from concrete, clay and stone.
- EN 50130:2011 - Alarm systems.
- IEEE 802.15.1 - IEEE 802.15.1 (Bluetooth).

#### 4.2.7.2. Note

No specific standards apply for this field that directly relates to ICT and AHA. But geo-localisation is an area where there is scope for further consideration around standards to be made – at least where the needs of people with dementia are a focus of attention.

### 4.2.8. Transport

ICT is increasingly playing a part in helping people with mobility impairments and, therefore, is of particular importance to older people. In public transport, ICT can help passengers with different modalities of notification (e.g. audio and textual information about next stops, destinations, ticketing information). With evolution of technologies, there are also ICT options for more personalised services for transport (ably demonstrated by Uber – whose operational procedures around taxi usage have caused major disruption).[47]

In the field of transport ICT will help AHA initiatives and activities to support people in at least three ways:

- Specific transport solutions for remote and flexible working;
- Accessibility and affordability for public transport services; and
- Personalised transport solutions.

[45] http://www.consilium.europa.eu/en/meetings/epsco/2017/12/07-08/

[46] https://www.electronicshub.org/mems-based-sensors/

[47] A case study of Uber is available here - http://soumyasen.com/IDSC6050/Case15/Group15_index.html

**Transport solutions to serve economic centres and remote and flexible working** will, it is considered, help older people in many ways – especially for those with mobility or sensory challenges. They may also improve security – a matter of extra importance for older people who may feel more vulnerable when travelling, especially at night time.

The matter of **accessibility and affordability of public transport** clearly links to the PROGRESSIVE ethical tenets that relates to these. It requires that information is provided visually and audibly as well as ensuring and appropriate physical configuration of buildings, vehicles, etc. or the provision of relevant support services e.g. on rail services and with aircraft to assist people with reduced mobility. Public transport accessibility, in fact, is one of the main issues that sometimes require older people or people with a disability to use alternative (often costlier) modes of transport. With the guarantee of some accessibility principles being followed for in public transport, people's choices are expanded and their scope for inclusion in social and economic life is increased.[48]

Mention must be made in this context (albeit briefly) of the potential of driverless cars (or vehicles) – an innovation for which standards will definitely be required. But what cannot be overlooked in the context of ICT for AHA is the disproportionate advantage that may be afforded to older people.[49] These will help to deliver **personalised transportation solutions**.

#### 4.2.8.1. Standards and Guidelines

*International Standards*

- ISO 10865 - Wheelchair containment and occupant retention systems for accessible transport vehicles designed for use by both sitting and standing passengers.
- ISO 15118-1:2013 - Road vehicles -- Vehicle to grid communication interface -- Part 1: General information and use-case definition.
- ISO 15118-2:2014 - Road vehicles -- Vehicle-to-Grid Communication Interface -- Part 2: Network and application protocol requirements.
- ISO 15118-3:2015 - Road vehicles -- Vehicle to grid communication interface -- Part 3: Physical and data link layer requirements.

*European Standards*

- CEN/TR 16427:2013 - Intelligent transport systems - Public transport - Traveller Information for Visually Impaired People (TI-VIP).
- EN 81-40:2008 - Safety rules for the construction and installation of lifts - Special lifts for the transport of persons and goods - Part 40: Stairlifts and inclined lifting platforms intended for persons with impaired mobility.
- EN 81-41:2010 - Safety rules for the construction and installation of lifts - Special lifts for the transport of persons and goods - Part 41: Vertical lifting platforms intended for use by persons with impaired mobility.

[48] https://www.sciencedirect.com/science/article/pii/S1877042812003783

[49] See http://theconversation.com/driverless-cars-really-do-have-health-and-safety-benefits-if-only-people-knew-99370

- EN 81-70:2003 - Safety rules for the construction and installations of lifts - Particular applications for passenger and good passengers' lifts - Part 70: Accessibility to lifts for persons including persons with disability.
- EN 81-82:2013 - Safety rules for the construction and installation of lifts - Existing lifts - Part 82: Rules for the improvement of the accessibility of existing lifts for persons including persons with disability.
- EN 12312-14:2014 - Aircraft ground support equipment - Specific requirements - Part 14: Disabled/incapacitated passenger boarding vehicles.
- EN 13816:2002 - Transportation - Logistics and services - Public passenger transport - Service quality definition, targeting and measurement.
- prEN 16584 - Railway applications - Design for PRM Use - General requirements.
- prEN 16585 - Railway Applications - Design for PRM Use Equipment and Components onboard Rolling Stock.
- prEN 16586 - Railway applications - Design for PRM Use - Accessibility of Persons with Reduced Mobility to rolling stock.
- prEN 16587 - Railway Applications - Design for PRM Use - Requirements on Obstacle Free Routes for Infrastructure.

*National Standards*

- PNE 178306 - Accessible mobility in Smart Cities.

#### 4.2.8.2. Note

ICT in the field of transport carries particularly important implications for older people given the potential for better and more personalised modes by which location, destination, time and related information can be provided for the benefit of individuals who may (as with many older people) have particular needs and challenges). The linked potential around driverless cars (or, rather, driverless *vehicles*) needs to be actively considered.

# 5. Procurement for ICT in the Context of Age Friendly Communities

Section 5 focuses on procurement – i.e. the manner in which organisations 'procure' (or develop frameworks for 'commissioning') products or services that are relevant to older people with health, social care or support needs. Health and well-being have, of course, been noted as a prerequisite to people's inclusion – this impacting, in particular on older people.

The context is one where public (and third) sector organisations can, using the resources available to them, exercise considerable influence on the design and configuration of products and services that are then provided to or accessed by older people or others in need (or assessed as being in need). That influence can be reflected in the way that specifications are written and, in the way, that standards are referenced (potentially as a requirement that must be satisfied). Some of the PROGRESSIVE ethical tenets can apply in this e.g. regarding 'Accessibility and Usability' and 'Interoperability'.

Inside section 5.1, there is an overview of ICT procurement topics. This identifies of the main interest areas. Section 5.2 contains specific notions about the procurement in the ICT field for AHA, noting the importance of the European Accessibility Act and aspects of standardisation processes. The last section (5.3) offers a set of recommendations for procurers. These are included later as part of the audit procedure (Section 7.1).

## 5.1. Procurement and eProcurement in EU: Overview

To strengthen the Single Market and as part of the continuous effort to stimulate investment in the EU, the Commission has put forward an initiative to carry out procurement more efficiently and in a sustainable manner, while making full use of digital technologies to simplify and accelerate procedures.[50] In relation to this, the Commission has recommended that steps to be taken by Member States to ensure that public buyers have the business skills, technical knowledge and procedural understanding needed to comply with the rules and make sure that taxpayers get the best goods and services for their money.[51]

The Commission endeavours to support such public buyers by facilitating the exchange of good practices and innovative approaches. It has noted, in an overview by DG Connect in 2017, various research and innovation projects active in this field, divided into four types as follows: [52]

[50] http://europa.eu/rapid/press-release_IP-17-3543_en.htm

[51] Commission Recommendation (EU) 2017/1805 of 3 October 2017 on the professionalisation of public procurement — Building an architecture for the professionalisation of public procurement (Text with EEA relevance.)
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017H1805

[52] EU-funded Research & Innovation in the field of ICT for Health, Wellbeing & Ageing: an overview.
http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=2852

- **Managing health and care**: Projects and initiatives that help patients and healthcare professionals to manage a certain condition; or promote preventative approaches to help people to stay healthy.
- **Innovating in health and care:** Projects that offer different and more integrated frameworks for relevant service provision – including those that give attention to interoperability. Relates also to projects that facilitate that innovation through procurement measures.
- **ICT solutions as signalled in or promoted through the AAL programme:** Projects specifically concerned with supporting AHA – including the use of robotic devices.
- **Projects funded by the SME Instrument:** Projects concerned with innovative product development and which help accelerating 'speed to market' for ICT related solutions for health and associated needs.

Regarding the ICT for AHA, the overview noted seven interest areas:

- Robotics for ageing well.
- Innovative solutions for independent living.
- Innovating in relation to care for older people.
- Better connected integrated care.
- Frailty, early detection and intervention.
- Falls prevention.
- Knowledge sharing and standardisation related to ageing well.

Within European projects, there are some initiatives have been noted that could help to develop actions for a better procurement about ICT for older people. Notable is Stop and Go project that offers a 'flexible procurement template' (the EST, European Specification Template) relating to health and social care initiatives. This template was tested in seven locations.[53]

Through these and other initiatives it may become possible to identify where there may be a need for new standards and to define frameworks that can help - for example, to provide public goods and inclusive services that support home-based independent living.

The Public Procurement Package published by the Commission makes reference to 'the European catalogue of ICT standards for public procurement, to improve interoperability and avoid vendor lock-in' (see page 8).[54] It focuses on some important needs as follows:

- Pursuit of more strategic approaches.
- Scope for savings in public budgets.
- Pursuit of 'better outcomes for societal and other public policy objectives'.

[53] http://stopandgoproject.eu/wp-content/uploads/2017/04/WP6_STOPandGO_D6.1-v3.2.pdf

[54] COM(2017) 572 final "Making Public Procurement work in and for Europe" http://ec.europa.eu/docsroom/documents/25612

- Taking account of member state initiatives and European projects.
- Sustainability ('innovative, green and responsible public procurement') and satisfying 'accessibility or other qualitative criteria', noting that the latter are 'underused'.
- Giving ‘attention to participatory budget approaches’ with ‘increased attention to strategic criteria promoted by local groups.

It also references eCertis, the European Single Procurement Document, together wth the Commission intention to 'further improve and promote the tools and standards'.[55]

## 5.2 Procurement in ICT for AHA

The EU Parliament proposal: the European Accessibility Act aims to improve the functioning of the internal market for accessible products and services by removing barriers created by divergent legislation.[56] It will facilitate the work of companies and will bring benefits (through setting common functional assessment requirements) for disabled and older people. An enabling policy and implementation framework and guidance on innovation friendly public procurement procedures is under preparation.

The Act covers the products and services listed below that have been identified (with consideration given to the UN Convention on the Rights of Persons with Disabilities and after consultation with stakeholders including experts on disability) as having the highest importance in relation to accessibility requirements:

- Computers and operating systems
- ATMs, ticketing and check-in machines
- Smartphones
- TV equipment related to digital television services
- Telephony services and related equipment
- Audio-visual media services such as television broadcast and related consumer equipment
- Services related to air, bus, rail and waterborne passenger transport
- Banking services
- e-books
- e-commerce

The Act includes three Annexes and an Implementation Plan.[57,58] It represents an important opportunity for standards (and procurement processes) to be adjusted in order to reference the Act’s requirements around ICT for AHA (and more). This will further help to ensure

[55] https://ec.europa.eu/growth/tools-databases/ecertis/

[56]Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the approximation of the laws, regulations and administrative provisions of the Member States as regards the accessibility requirements for products and services - COM/2015/0615 final - 2015/0278 (COD) http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2015:0615:FIN

[57] http://ec.europa.eu/social/BlobServlet?docId=15017&langId=en

[58] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0266

attention to older people (and their representative organisations) within the world of standards – noted earlier as having often been largely overlooked. Shortcomings in the design and configuration of products or services in specific areas might, as a consequence, be overcome and objectives implicit in PROGRESSIVE's ethical tenets done justice to.

### 5.2.1. The ICT Call for Tenders

Writing a call for tenders is an essential part of the procurement process for a wide range of goods and services. European Mandate 376 provides practical advice and samples of text describing accessibility requirements and criteria that can be used.[59] In the area of disability (and, therefore, relevant to the position of many older people) calls for tenders, if following the mandate, require the clear definition of selection criteria (i.e. the eligibility and selection criteria for tenderers); accessibility requirements contained in a specification; and the award criteria (by which the favoured tenderer is selected). The last of these may take account of the 'Accessibility Requirements Generator', also available through the Mandate.[60] The determination of weightings for different criteria will, of course, depend on the object of the contract since they must allow the level of performance offered by each tender to be assessed appropriately and the value for money of each tender to be considered. Accessibility award criteria can, for example, be based on:

- Range of people gaining benefit;
- Range of disabilities that are addressed;
- Interoperability with assistive technologies; and
- Innovativeness of a proposed technical solution (better performance, lower price, or both).

## 5.3. Recommendations for Procurers of ICT for AHA

Public procurement is big business – and business listens to requirements set in government tenders. The World Trade Organization estimates that on average public procurement accounts for 10-15% of a country's Gross Domestic Product (GDP). In the European Union the figure is as high as 16-17% of GDP.

Some suggestions for procurers in the field of ICT for AHA are set out below. They may help the decision to buy products and services that are designed to be more inclusive and take account of older people and/or people with limited digital literacy.

- **For ICT products, refer to law and standards.** National laws usually refer to international standards or guidelines for development of ICT products (hardware, software, web). In Europe, for example, the Web Accessibility Directive (2102/2016) refers to the EN 301549 standard that set requirements and conformance testing for hardware, software, web, non-web documents and communication services (audio/video). Requiring that products conform to EN 301549 will benefit a wide

[59] http://mandate376.standards.eu/procurement-stages/call-for-tender

[60] http://mandate376.standards.eu/procurement-stages/writing-a-call-for-tenders/wizard/technical-requirements/

range of users, can facilitate personalised solutions and the integration of ICT with assistive technologies.

- **For other products that are technologies based, refer to standards (where available).** In every country standardisation bodies have activities that support the development of standards at national, European or international levels. Policy makers should consult lists of available standards directly from national standardisation bodies or databases which specifically list selected standards for AHA fields - like PROGRESSIVE Standards Database.[61] Using products that conform to appropriate standards can give procurers a baseline of ethically oriented requirements (accessibility, usability, security, etc.) that can help ensure a higher quality of products and services.
- **Involve users before, not (only) after.** It is often important to consult with potential users before procurement of products. The importance of co-production has been noted earlier in this report. End users can highlight issues that inform the selection of products in relation to both generic and specific requirements. In AHA fields, users can - with their experiences - give a 'premium value' to procurement procedures.
- **Writing a good call for tender.** A good tender invitation will follow relevant consultations and be based on:
    - *Selection Criteria* - deciding who can bid for the work.
        - Previous experience of contractor.
        - Have they previously failed to deliver a required level of accessibility?
        - Have they the capacity to incorporate accessibility into the product / service?
    - *Technical specifications* – mandatory requirements
        - Specify accessibility requirements carefully – proportionate and related to the subject matter of the procurement.
        - Only use recognised standards.

An audit tool to support procurement activities is outlined in Section 7.1.

# 6. Education and Employment in ICT for AHA

Information is provided here about how older people can better involved in activities relating to ICT products and services. In first section (6.1) the opportunity to involve older people using technology in relation to their everyday activities is noted. In section 6.2 the benefit and barriers that older users can find using ICT are explored – with attention given to the opportunity offered by new technologies for living independently and for a social participation. Section 6.3 gives information about the importance of education and learning, especially the role of coaching to assist in people's use of new technologies. The potential for employment with ICT and older people is explored in section 6.4 (a sector where there is arguably the need for more good practice to be identified and for related guidelines). Section 6.5 offers some recommendations for employers and employees.

[61] https://progressivestandards.org/standards-database/

## 6.1. Older People as an Asset

Debate about our ageing society has been conducted typically in terms of the problems and costs of supporting growing numbers of older people. The PROGRESSIVE project has stood against such approaches and has consistently recognised older people as an asset. This is explicit in many of the ethical tenets (D2.1 – see Table 1) that point to the need for approaches (in product and service design) that include and empower older people. It recognises, as indicated in a UK study, that older people are far from being a burden to our economies are, in fact, net contributors.[62] In reaching this conclusion the study in question took tax payments, spending power, caring responsibilities and volunteering effort of people aged 65-plus into account - finding older people contribute almost £40bn more to the UK economy than they receive in state pensions, welfare and health services.

Such a contribution of older people, it is contended, can be increased if a higher proportion of older adults can live independently and safely in their homes of choice - with the right community, transportation, social and health-care systems in place. ICT and age-friendly communities play an important part in this. Of course, many older people will, when needed, access social work and care services in the future. But the configuration of such services, linking with ICT (including attention to smart homes and communities and the transition of social alarms through telecare to telehealth), point to an unrealised potential for ICT to help empower their users as opposed to rendering them the recipients of 'delivered' services.[63]

## 6.2. Older People and ICT

ICT can enable older people to live more independently and extend the time they remain active and safe in their preferred environment. Such technologies can range from the telephone (whether landline or mobile) to computers and interactive television. Increasingly, different ICT devices are interoperable - with considerable attention now being given to telecare and telehealth; to 'smart homes' (incorporating e.g. automated lighting, fall detection, safety devices, etc.) and the 'Internet of Things'. It follows that ICT also has a huge potential to enhance social inclusion and the participation of older people through e.g. video conferencing and facilitating access to social media.

Some older people who feel or think that **using technology is difficult prefer to withdraw from active participation in some areas of their lives**. Acceptance of ICT by older adults is usually slower when compared to younger age groups. At the same time the effectiveness of learning may decrease (due to lower motivation, weaker efficiency of mental processes, and also weaker sight and/or hearing). As a result, when using a ICT like personal computers, its common software and the Internet and its resources the average person who is aged 50+ years old is less fluent in comparison to younger people.

[62] http://www.wrvs.org.uk/

[63] See Fisk M (2018) 'Supporting Older People: ICT and the 'New Thinking' for Social Work and Social Care' XV. Hradec Days of Social Work (2018): Proceedings, Hradéc Kralové, Czech Republic.

### 6.2.1. Benefits for Older People using ICT

There are various benefits and limitations to the use of technology by older people. Here, technology use is examined in terms of:

#### 6.2.1.1. Reducing loneliness and isolation

The use of modern technologies, particularly the Internet, is an excellent medium for establishing and maintaining social contact. Although exclusion from technology increases with age, the pattern of access and use is changing year by year, especially now that people who are retiring from work are more likely to have used ICT as part of their jobs.

#### 6.2.1.2. Enabling people to 'be in control'

The older population (particularly aged 65+) is increasingly using modern technologies, particularly the Internet, for functions other than maintaining social contact. In the European Union, as of the beginning of 2017, more than four fifths (84 %) of all individuals (in the EU-28) aged between 16 and 74 years, used the internet (at least once within the three months prior to the survey date). At least 9 out of 10 individuals in Denmark, Luxembourg, Sweden, the Netherlands, the United Kingdom, Finland and Germany used the internet during the three months prior to the survey.[64]

#### 6.2.1.3. Living independently

The focus for the use of technology to help older people to live independently in their own homes for longer has related to the use of a range of assistive technologies including social alarms, telecare and, more recently, telehealth. With regard to the evolution of the latter, a useful categorisation is provided in terms of generations.[65] Each indicates the use of technology to provide respectively care and health services at a distance.

- First generation: User-activated community alarms (social alarms).
- Second generation: Home monitors – sensors that monitor the home environment, vital signs and physiological measures. These are typically linked to a monitoring centre.
- Third generation: The use of communications technology (broadband, wireless, audio-visual) to enable virtual or tele-consultations between the service user and a doctor, nurse or support worker.

#### 6.2.1.4. Participating and contributing

Although there is a dearth of evidence concerning the contribution of ICT to older users, there is a body of knowledge on the factors that influence older people's effective use of these, especially of the internet. The main specific barriers to use are lack of access, interest or motivation, and the lack of necessary skills to make use of what is on offer.

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[64] https://ec.europa.eu/eurostat/statistics-explained/index.php/Digital_economy_and_society_statistics_-_households_and_individuals#Internet_usage

[65] Doughty K, Cameron K and Garner P (1996) 'Three Generations of Telecare of the Elderly', Journal of Telemedicine and Telecare 2,2.

- **Access.** The issues surrounding access have two main aspects viz. cost and (physical) accessibility and usability. Firstly, cost: Even though technology prices are dropping, the affordability of equipment and/or the cost of usage, and the need to sign up to a contract demanding regular payment, remain significant barriers for some older people. Pricing structures, as well as price itself, influences take-up. Secondly, the lack of accessibility is another problem especially for people who have disabilities (including poor vision, or lack of dexterity). Research published by the University of Ulster concluded that poor website design often contributed to the difficulties faced by older internet users, with 55 percent of websites investigated not meeting even the most basic standards of usability and comprehensibility.[66] Yet simple adaptations to ICT materials and websites can have a marked improvement on accessibility and usability. A recent SPARC (Strategic Promotion of Ageing Research Capacity) report found that: "by using targets which expanded to a larger size, giving the user a larger area to click on, users were able to point and click faster and make fewer mistakes".[67]
- **Motivation.** There can be a lack of interest and perceived benefit on the part of older adults in technologies. Large numbers of people report that the reason they do not use the Internet and other technologies is that they have no need for it, or no interest. This is at least in part because technology suppliers often use jargon when describing their products, aim their products at a younger market and make it difficult for older people to identify the benefits.
- **Skills and confidence.** The rapid progression of technology can result in the need for ongoing support. There can also be concerns about viruses, privacy and fraud. A lack of confidence in terms of usage of the technologies can be a problem among older people who do not have immediate family or friends who are engaged with it, and so do not get the help and guidance that many might find valuable.[68] Institutional learning environments may also not be appropriate for older people and can detract from, rather than build up, their confidence.

### 6.2.2. Barriers for Older People using ICT

Six barriers impacting on older people's use of ICT are listed below.

- **Lack of perceived benefit or need.** Some older adults who do not use the internet do not think they would get much out of doing so.[69] Research has shown that, in

[66] Investigating the Problems Faced by Older Adults and People with Disabilities in Online Environments. K. Curran. et al. Behaviour & Information Technology, 26 (6), November–December 2007: 447–453-

[67] Improving Computer Interaction for Older Users: Using dynamic on-screen targets, executive summary. F. Hwang. et al. SPARC website http://www.sparc.ac.uk/media/downloads/executivesummaries/exec_summary_hwang.pdf

[68] 'Does the Internet Help to Overcome Social Exclusion?' P. Foley. et al. 2004. http://www.ejeg.com/issue/download.html?idArticle=30

[69] Gitlow, L. (2014). Technology use by older adults and barriers to using technology. Physical & Occupational Therapy in Geriatrics, 32(3), 271-280.

general, older people are very task-oriented when learning ICT skills. They need to understand exactly what the benefit will be before they are motivated to do it.[70] To help older adults see a benefit in using technology, it may be helpful to demonstrate some benefits that are relevant to them. For example, showing an avid sports fan how to find statistics for a relevant sports team. For others their interest may be in quickly locating an old-fashioned hand cream that they have been trying to find for years. The marketing of educational classes might, furthermore, be more effective when they mention the specific need that they are seeking to answer. For example, a class called 'Email your grandkids' or 'Keep up with your family on Facebook' might generate enough motivation for an older adult to sign up for a class.

- **Negative feelings about social media.** Older adults who have not used social media may have very negative views about using ICT for social networking. In an article that posed the question 'Who over 65 is online?' it was found that older adults dislike social networking in part because they fear it will have a negative effect on their face-to-face social interactions.[71] They may be frustrated that communication modes have changed so dramatically from the phone calls and personal visits that they are more accustomed to towards emails, tweets and Skype. But it may help to point out to older people that those who do venture into the social networking universe have reported benefits in terms of social connectedness and increased interactions.[72] Rather than waiting for letters to arrive via the post, some older people now make regular contact with their grandchildren through Skype or Facetime.
- **Fears about internet safety.** Some older adults have a mistrust of putting any personal information onto a computer and do not want to learn about ICT until they feel safe going online.[73] In a world where cyber-attacks are often publicised, such fear is not without justification. This challenge can at least in part be addressed by talking to older adults about internet safety and best practices, such as creating strong passwords, adjusting privacy settings, and not posting personal information such as a physical address or vacation dates on social media. Specific classes that deal with staying safe online that could usefully cover topics including antivirus software, spam and phishing scams.
- **Computer anxiety.** Many older adults are fearful they will 'break' a computer and may be extremely hesitant to touch one or to play around with any part of it. That anxiety will prevent them from signing up for an educational course or make it difficult for them to learn the necessary skills. Some instructors start a class by dangling the

[70] Callahan, J. S., Kiker, D. S., & Cross, T. (2003). Does method matter? A meta-analysis of the effects of training method on older learner training performance. Journal of Management, 29(5), 663-680.

[71] Vroman, K. G., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" older adults' dispositions toward information communication technology. Computers in Human Behavior, 43, 156-166.

[72] Gatto, S. L., & Tak, S. H. (2008). Computer, internet, and E-mail use among older adults: Benefits and barriers. Educational Gerontology, 34(9), 800-811.

[73] Fausset, C. B., Harley, L., Farmer, S., & Fain, B. (2013). Older adults' perceptions and use of technology: A novel approach. In Stephanidis C., and Atona, M. (Eds.) Universal access in human-computer interaction. user and context diversity (pp. 51-58) Springer-Verlag: Berlin Heidelberg.

mouse by the cord or hitting a few incorrect keys just to show students that computers are perhaps not as fragile as they thought.[74]

- **Cognitive or physical issues.** Older adults experience declines in vision, memory, dexterity, mobility and other physiological or physical skills which may make it difficult to perform basic tasks such as handling a mouse or viewing a computer monitor. Modifications can make library computers used for training more accessible. For example, a larger flat screen monitor will help a person with declining vision. Some older people may find it easier to use special keyboards, such as a commonly available model that has large bright yellow keys with easy-to-read black letters.[75] A number of adaptive features are built into popular software and older people can be shown how to use them. For example, Microsoft Windows 10 offers a number of accessibility options including a built-in screen-magnifier and the option to use speech recognition to control the computer.[76] For those with hearing difficulties, Windows 10 offers the option of a visual display or text display on the screen to replace the typical sound cues that tell a user that an activity is taking place or action is needed.
- **Lack of access.** Older people may not have internet access at home or may not have any other form of access to a computer. Library computers are an obvious solution but only if the computers are available for practice. Setting up older people-only classes and practice times can help to solve this problem. In addition, classes to help older people figure out the differences between various computers might help those who are thinking about buying some technology. Some libraries have tried 'Technology Petting Zoos' where patrons can come at look at various laptops, tablets and desktops and explore how they work.[77]

## 6.3. Role of Coaching and Education

Coaching is a form of activity in which a person supports a learner or client in achieving a specific personal or professional goal. It is achieved through the provision of training and/or guidance. It may be in the context of a formal or informal relationship between two (or more) people, of whom one has more experience and expertise than the other and offers advice and guidance. It differs from mentoring because it focuses on specific tasks or objectives, as opposed to more general goals or overall development. Coaching is a form of change facilitation – it helps close the gap between where a person is in their life and where they would like to be.[78]

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[74] Bean, C., & Laven, M. (2003). Adapting to seniors: Computer training for older adults. Florida Libraries.

[75] https://www.w3.org/WAI/RD/2012/text-customization/r11

[76] https://www.microsoft.com/en-us/accessibility/windows

[77] Pew Research Center. (2015). Americans' Internet Access: 2000-2015. Retrieved from: http://www.pewinternet.org/2015/06/26/americans-internet-access-2000-2015/

[78] Life Coaching with the Elderly (Elaine Voci, Ph.D.) May 15, 2012 - IAHHC Annual Conference 2012.

How is coaching different from counselling or psychotherapy? A social worker can advise about service choices and processes to follow. Counselling or psychotherapy can be useful for people who feel unable to cope – usually exploring how events in life can 'get in the way'. A coach will empathise with an individual's feelings, but the main focus is on problem-solving and moving forward. So, coaching is more future facing than counselling or psychotherapy. It is, therefore, potentially well attuned to the world of ICT.

### 6.3.1. ICT, Education, Social Inclusion and Older People

ICT can enable older people to live more independently and extend the time they remain active and safe in their preferred environment. The technologies can range from the telephone (whether landline or mobile) to computers and interactive television. Increasingly, different ICT devices are interoperable - with considerable attention now being given to telecare and telehealth; to 'smart homes' (incorporating e.g. automated lighting, fall detection, safety devices, etc.) and the 'Internet of Things (IoT)'. ICT also has a huge potential to enhance social inclusion and the participation of older people through video conferencing and social media.

Much of the potential of ICT for AHA has arisen in the last 10-12 years with the development and rapidly growing importance of the Internet. The take up within the world of commerce means, however, that many older people have not developed digital skills - despite the fact that it has much to offer as a means of keeping in touch with family, perhaps in other parts of the world; obtaining information about health and financial matters; retaining their position in (or returning to) the workplace; for entertainment; and to further their education or learning. It also offers possibilities for intergenerational cooperation with, for example, children coaching their grandparents.

For health and well-being, the potential benefits have special significance through improvements in health literacy and the ability to self-manage (e.g. in relation to health), self-esteem, income and the capacity to deal with some of many challenges of older age. For care providers, furthermore, ICT can support improvements in the quality of care and make overall care provision more economically sustainable by, for instance, avoiding and reducing hospital stays (through remote monitoring).

But as technological progress is now very fast, some older people may not feel well engaged to the contemporary world. The number of mobile technologies, mobile devices and possible applications (apps) for doing everyday tasks (e.g. purchases or payments) in different places and situations in real or virtual world becomes so great that a large part of the population that many may lack knowledge and/or feel uncomfortable. This discomfort may be exacerbated by the withdrawal of some traditional ways of service provision (bank or post office closures, for instance). Activities such as searching for information about the work or special additional training; possibilities of realising one's hobby; acquiring different information like using medical care or checking cultural events; and even managing of one's own finances, become more difficult, potentially costlier and in some cases impossible without using ICT. Such matters mean that coaching for older people in relation to ICT 'opportunities' may be particularly challenging *and* important.

### 6.3.2. Communicating with Older People

Communication with older people (whether or not mediated by ICT) is important. Useful guidance, albeit in the context of volunteers, has been produced by the IFRC (International Federation of Red Cross and Red Crescent Societies). This affirms that good communication between volunteers and older people can help establish cooperation, reduce the potential for conflict, foster better understandings and save expenditure of emotional energy.[79] People (whether or not volunteers) working with older people need to know what constitutes good, clear and constructive communication, and how to actively listen. They will also need to know how to communicate with older persons where there are cognitive, sight or hearing impairments. This will often require specialist training or advice.

Communication (verbal and non-verbal) is the transfer of information from one place to another. It is a way of communicating wishes and requirements, and also of exchanging ideas and opinions. Verbal communication requires two skills: speaking and listening. Non-verbal communication refers to gestures, facial expressions, tone of voice, posture, physical distance between communicators. Good communication involves both.

As noted in the next sections, can be important to consider the environment where coaching (involving good communication) takes place – whether as part of an everyday interaction or mediated through the use of ICT.

## 6.4. ICT, Older People and Employment

ICT can contribute to help make the world of work more age-friendly in a number of ways. It can assist and compensate for functional restrictions and therefore improve the employability of
people who are at risk of being excluded from the labour market. The introduction of ICT can change the organisation of work, making it more flexible and offer opportunities for innovative working environments that better fit with individual needs (some of which may relate to ageing). And the number of people retiring early could potentially be reduced by using ICT to help maintain their productivity and enjoyment in work.

In addition to these potential advantages in the work environment, ICT can benefit older people beyond the working sphere. This is because the workplace is a key environment for the development of ICT skills that are transferable. For many older people, the workplace, therefore, has become the setting where they gain experience in using ICT and develop skills which can then be used elsewhere.

But ICT can also present new threats for older workers and unemployed older people. For instance,
physical and cognitive functions change with age and may not, as noted earlier, be best suited to current modes of ICT, such as visual displays and mouse-type input devices. The pace of work often becomes more intense as a result of new ICT and some older workers may struggle to keep up. In addition, the perception of older workers as not being able or willing to cope with technical innovations and to develop adequate skills is still widespread.

[79] http://www.ifrc.org/PageFiles/133694/community-based-homecare-older-people-minimum-standards-en.pdf

Hence, we see an age-divide in the information society (IS) that can also exist in employment.[80] There is a risk this divide will become embedded, leading to greater social exclusion. Thus, inclusion of older people, including older workers, must be a key element of Europe's eInclusion policy. It is, of course, a PROGRESSIVE ethical tenet.

AHA is about older people staying active and productive for longer. Specifically, ICT can contribute to access to work and employment in three main areas:

- In general employment fields, ICT can increase the flexibility and adaptability of work and
  working conditions in line with changing labour market requirements and individual needs and preferences.
- For carers, volunteers and those with other responsibilities, ICT can help improve work-life balance, equalise occupational chances and create new employment opportunities.
- For 'at risk' groups, ICT can enable access to supportive resources and networks so as to improve their employability. Assistive technologies can also compensate for functional impairments of older workers or workers with special needs.

It can be noted in this context that jobs involving ICT tend to be better quality, involving non-repetitive, non-monotonous tasks and characterised by low levels of physical strain. Indeed, the introduction of ICT is often associated with improved job quality, provided there is proper preparation and support. However, it appears that an intensification of ICT-based work is sometimes creating poorer (more stressful) working environments (e.g. in call centres). Excessive hours, information overload and increased complexity can exacerbate stress, with reduced human and social contacts potentially contributing to feelings of isolation. Physical impairments (e.g. repetitive strain injury, musculoskeletal injuries and eye strain) can also increase.

But, broadly speaking, ICT can help older workers to get a job (if unemployed), to stay in work, and/or to change jobs with the same or to a different employer. In terms of occupational mobility therefore, ICT (and developing the necessary associated skills) can be important enabler for older workers.

### 6.4.1. Sharing Good Practices

Despite some inevitable decline in mental and physical abilities in old age, there is growing evidence that older workers can rely on their professional experience to adapt and compensate, and so maintain their productivity - if assisted by suitable workplace adjustments. Innovative working methods entail various aspects of work organisation (including labour laws) to ensure equality of opportunity for older workers, through access to work that is 'age-friendly' (a natural component, of course, of age friendly cities and communities). There are also opportunities to exploit ICT so as to make work more flexible, for instance through tele-work. Hence, best use and diffusion of age-friendly ICT combined

[80] ICT for Active Ageing at Work: Reflection Paper for the i2010 eInclusion Sub-Group (April 2007)

with exchange of good practices can play a role in creating frameworks within which more older workers are able to thrive.

While good practice examples already exist across each of these areas, they are largely anecdotal and isolated. Their positive results are not sufficiently shared and there is a substantial lack of awareness among both employers (e.g. SMEs and public services) and older workers on the opportunities. Testing of new ICT-enhanced working methods for older workers and sharing of good practices is necessary for Europe to fully realise the potential of its older people in the workforce.

This suggests awareness campaigns could be an important step in the exchange of knowledge on the potential for age-friendly ICT solutions and working environments for employers, workers and public service providers. This could usefully be coupled with the development and replication of age-friendly training activities and methods.

## 6.5. Recommendations

At present, the market for ICT for AHA at work fails to fulfil its full potential for reasons mostly related to the market characteristics noted above. An initial analysis by the European Commission identifies several market barriers and market failures in ICT for Ageing, which can be grouped as follows.

In this context we recommend that policy makers promote and endorse:

- harmonised standards that could be useful for increase accessibility of ICT, and at same time to support the development, where needed, of digital skills increase for older people; and
- the adoption of policies that utilise standards that support the use of ICT in inclusive ways. In particular, this action needs to be correlated by education or learning opportunities (especially training on the job) for the older worker to more fully appreciate the power of technology and how it can help them to stay in or return to work.

### 6.5.1. Regulatory Barriers

Without proper regulatory approaches and replication of initiatives at EU level, potential solutions from local authorities combined with differing national certification and reimbursement schemes for ICT solutions might only add to the technical and regulatory burden of the sector. The current lack of legislative support for interoperability (a PROGRESSIVE ethical tenet) and for the use of standards is a barrier.

In the health and care sectors there are, furthermore, differences in reimbursement schemes that can hamper the introduction of innovative solutions. Uncertainties exacerbate this, e.g. about what should be financed collectively rather than by the individual. There is, furthermore, slow progress in improving the accessibility of ICT and questions remain about the effectiveness of accessibility related legislation.

### 6.5.2. Market Visibility / Transparency, Fragmentation, and Basic Access Barriers

Lack of awareness has been a key factor in why the market for ICT in relation to older people has not been adequately addressed so far by European industry. Market and industry fragmentation has not helped and, in some areas the need for products and services for older people have been considered as ‘niche’ (even though ‘design for all’ approaches enable the development of *bigger* markets). The lack of interoperability of assistive and health-related ICT with mainstream technologies has exacerbated the position - giving rise to sub-optimal markets with higher prices for users and lower profits for suppliers and service providers. It follows that many companies are operating on a trial-and-error basis.

### 6.5.3. Technical Barriers

The diffusion of ICT applications and services for older and disabled people is limited by initial high economic costs linked to investments in research and in technology uptake. There will be benefit for some initiatives in public and private providers sharing the cost of innovation in key areas.

# 7. ICT and AHA: A Possible Roadmap

Three guidelines are set out for standards around ICT for AHA for age-friendly communities (including in the field of procurement). These are aimed at standards bodies and others concerned with developing strategic frameworks for age-friendly communities (and may e.g. through procurement, be instrumental in determining the ICTs that support the communities more generally and older people more specifically).

1. **Check relevant standards around ICT for AHA in Age Friendly Communities**
   Check and reference (or adopt) existing guides, guideline or standards where they have been developed and are 'fit for purpose'. Seek or promote standards reviews or the development of new standards where necessary. Utilise publicly available databases or specific AHA standards database (like the PROGRESSIVE Platform) to help with this.
2. **Check for good practices**
   Good practices can sometimes accompany standards, as examples. There may be a need to incorporate elements of good practice into standards. This should be undertaken with the involvement of older people. The guidelines in D9.1 apply; likewise, D10.1 regarding 'Draft Guidelines for Standards around ICT for AHA for Smart Homes that are Age-Friendly'.
3. **Promote the use of standards**
   Encourage age-friendly communities and companies to develop products that align with and support relevant or new standards. This can be done with sharing of public notices and case history inside the national body websites and newsletters. For procurement, follow the recommendations in section 5, with support of an auditing tool such as that offered in section 7.1.

In support of procurers, as described in section 5, some audit requirements for the evaluation of products and services related to the older users' needs are set out below. In this section no specific tool is offered since every organisation will have specific needs (e.g. web based). Before undertaking an audit, it is necessary to ensure that the staff involved are equipped to do the job. Sometimes a spreadsheet may be sufficient for solve any audit needs.

Before delving into the specifics of writing an audit report, it is important to have a broad view of the major objectives. This will help make sure the report does what it is supposed to do. In addition it must be noted that there are a few suggested items regarding openness in respect of the objective, the scope, and the criteria applied.

- **Illustrating non-conformities:**

  The main goal of any audit report is to illustrate where the product / service does not conform with whatever standard, rule, regulation or objective that it is supposed to. It is important to clearly identify (with evidence) the non-conformity, as well as the standard (or part of a standard) that it does not conform to. The goal is to ensure good information so that each non-conformity can be remedied.

- **Outlining positives:**

  An audit report should not just include negatives. This is especially true for compliance reports, and operational audits. This allows the organisation to focus on (and build on, if appropriate) areas that are working and apply these to other areas.

- **Opportunities for improvement:**
  Beyond indicating things that are not conforming to requirements (non-conformities), high-risk areas must be identified (albeit that they maybe current compliance) and indicate where these could be improved.

In the ensuing sub-sections, we propose some topics that need to be part of an audit for products and services being evaluated ICT for AHA and which, in particular, can serve to increase (per the PROGRESIVE tenets) 'Accessibility and Usability' and 'Interoperability'. Procurers should decide the priority for the different topics, and the weightings that will apply.

### 7.1.1. For ICT-specific products (hardware, software, Web) and for ICT-oriented-products (home automation, travel solutions): conformance to specific laws or standards

1. **Is there a legal requirement?**

   If conformance to national laws is required for a specific product or service, this is a mandatory. National laws may require conformity to European or international standards.

2. **Is an International / European standard available?**

   If an international / European standard is available and is sufficiently applicable, this (or part of it) should be referenced. Best endeavours should be made to identify relevant standards and whether they are open to 'certification'.

3. **Is a national standard available?**
   If a national standard is available and sufficiently applicable, this (or part of it) might be referenced. But care should be taken in view of the potential to create issues for the procurement of products or services from other countries. There should be clarity regarding whether they are open to 'certification'.

### 7.1.2. User involvement: co-production and/or testing

1. **Has product / service had a usability test?**

   It is advisable to check if the product / service has had a usability test. This will increase the possibility that product can be more user-friendly (and accessible) for older people.

2. **Has product / service been developed with testing / co-production with older users?**

   Specific testing involving older people might be requested or required. The views of older people should carry a high weighting when determining the merits / efficacy of a product or service.

### 7.1.3. Other selection criteria for contractor evaluation

1. **Has contractor relevant previous experience?**

   It is advisable to check previous experience and track record.

2. **Has contractor previously failed to deliver a required level of accessibility?**

   If contractor has already provided services, there may be evidence of a commitment to accessibility.

3. **Does contactor have ability for the product or service to interoperate with other products / services involved?**

   If a product / services need to interoperate with other products, the contractor must give appropriate guarantees.

4. **Does the contractor have a clear maintenance policy?**

   The nature of which is an essential consideration. This is particularly important for products that are web- or software-based.

5. **Does the contractor offer value for money?**

   The product or service cost must be true to what is known of the market (and comparable with similar offerings). Affordability to users is a consideration.

### 7.1.4. Auditing: an example of table report

An audit report can contain specific tables that relate to the above topics. An example of possible table that can be used as auditing tool is offered overleaf. In the simple (not to scale) example shown (Table 4 overleaf) there are six columns. A minimum points total might be determined.

- Topic: is the question of interest for the product or service evaluation. It must be clear where there are essential requirements that, if not met, will disqualify a contractor.
- Essential?: value can be “true” or “false”.
- Value/Weighting: is a number (from 0 to 5) that represents the importance of the topic in the procurement.
- Evaluation: could be:
  - Yes: the product / service satisfies the requirement.
  - No: the product / service doesn’t satisfy the requirement.
  - P: the product / service satisfies partially the requirement.
  - N/A: the product / service is not subject to the requirement.
- Findings: Issues that need to be resolved for satisfy the requirement.
- Comments: notes that can be useful including requests for clarification.

| ICT PRODUCT EVALUATION | | | | | |
|---|---|---|---|---|---|
| **Topic** | **Essential?** | **Value/ Weighting** | **Evaluation** | **Findings** | **Comments** |
| a) Is there a legal requirement? | | | | | |
| b) Is an International / European standard available? | | | | | |
| c) Is a national standard available? | | | | | |

| USER INVOLVEMENT | | | | | |
|---|---|---|---|---|---|
| **Topic** | **Essential?** | **Value/ Weighting** | **Evaluation** | **Findings** | **Comments** |
| a) Has product / service had a usability test? | | | | | |
| b) Has product / services been developed with testing / co-production with older users? | | | | | |

| OTHER SELECTION CRITERIA FOR CONTRACTOR EVALUATION | | | | | |
|---|---|---|---|---|---|
| **Topic** | **Essential?** | **Value/ Weighting** | **Evaluation** | **Findings** | **Comments** |
| a) Has contractor had relevant previous experience? | | | | | |
| b) Has contractor previously failed to deliver a required level of accessibility? | | | | | |
| c) Has contactor ability for product / service to interoperate with other products / services involved? | | | | | |
| d) Does contractor have a maintenance policy? | | | | | |
| e) Does contractor offer value for money? | | | | | |

**Table 4** - Evaluation for Product / Service

# 8. Conclusions

This deliverable, building on the work done within Tasks 8.1 to 8.4, offers significant, and often new, knowledge about the relevance and applicability of standards around ICT for AHA in the context of age-friendly communities. It provides pointes to activities and actions that are relevant to different stakeholders – but, in particular, standardisers. A strong theme relates to the link with PROGRESSIVE's ethical tenets – notable among which are 'Accessibility and Usability' and 'Interoperability'.

The following suggestions are supported within the report and, if followed, carry the potential for better approaches towards the challenge of ICT for AHA in the age-friendly context.

## 8.1. Suggestion for Standardisation Bodies

- Standardisation bodies should undertake targeted communication activities to stimulate and facilitate the engagement and involvement of older people in standardisation activities. Age-friendly communities and initiatives relating to the same represent an excellent context in which to do this.
- Older people (through AHA-related organisations where appropriate) should be seen as potential co-producers of standards. This can be done with the help of consultations both within and outside of the formal standards development process.
- Standardisation bodies should recognise the value of older people's engagement in standard development and provide low cost mechanisms for their involvement.

## 8.2. Suggestion for Age-Friendly Communities

- Municipal authorities and other agencies should use the opportunity offered by existing standards (listed in section 4) for the development / procurement of products and service for age-friendly communities.
- Collaboration with standardisers will help in the setting (or development of) guidelines for the design of services and criteria for product or service procurement that can bring about the greater integration of services involving the use of ICT.
- Municipal authorities and other agencies should promote education and outreach (using also coaching) to help older people in the development of digital skills in order to help facilitate greater inclusion in economic (including work) and social life.

## 8.3. Suggestion for Procurers

- Procurers should specify standards, wherever appropriate (and subject to being 'fit for purpose') for ICT products and services.
- Users should be involved in audits, in the co-design of tender specifications (and related documentation) and their evaluation.

## 9. Useful Links

- Access City Awards
  http://ec.europa.eu/social/main.jsp?catId=1170&langId=en
- AGE Platform Europe
  https://www.age-platform.eu/policy-work/age-friendly-environments-accessibility
- AFE-INNOVNET Towards an Age-Friendly Europe
  http://afeinnovnet.eu/
- Dublin declaration on Age-friendly cities and communities in Europe
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