FINAL REPORT

A Study concerning a Market Observatory in the Ambient Assisted Living field

Kurt Salmon ◆ IDC *Analyze the Future*

About Ambient Assisted Living Association:

The Ambient Assisted Living Association (AALA) is organizing the Ambient Assisted Living Joint Programme (AAL JP). The AAL JP aims at enhancing the quality of life of older people and strengthening the industrial base in Europe through the use of Information and Communication Technologies (ICT). Therefore, the AAL JP is an activity that operates in the field of services and actions to enable the active ageing among the population.

The programme is financed by the European Commission and the 22 countries that constitute the Partner States of this Joint Programme.

See more at: http://www.aal-europe.eu/

Table of Contents

List of Figures

List of Tables

Executive Summary

This is the Final report of the preliminary feasibility study for a Market Observatory in the Ambient Assisted Living (AAL) field, awarded by the AAL Association to Kurt Salmon and IDC. This report presents the final results of the study for discussion and feedback from the AAL Steering Group.

This study is organized in the context of the supporting activities of the AAL JP, with the ultimate goal to enhance the market orientation of the Programme and to contribute to bridge the gap between R&D&I and successful commercialisation of new solutions. To do so the AALA aims to set up a Market Observatory on Ambient Assisted Living providing market intelligence support on AAL solutions to the broad community of stakeholders, targeting all stages of AAL projects lifecycle (from project design to commercialisation).

Essential Methodology

The study leverages a wide range of data sources and applies several research methods to present the results and base the report conclusions and recommendations.

The study team conducted ad-hoc desk research among a series of public secondary sources (existing publications from the AAL Association, existing research, specialized press, dedicated web-sites, etc...) to qualify the necessary context and background of the study and obtain a viable definition of the AAL market. In parallel, a group of relevant stakeholders in the AAL field was directly engaged at an interactive workshop, which served as the main forum to identify the key stakeholders' needs and expectations in relation to an AAL Market Observatory. Additional and detailed desk research was then undertook to validate the data availability with a view to build an AAL Market Observatory: the team identified and monitored a large number of sources, in Europe and in the world, to investigate several AAL-related areas such as the actual and potential demand for AAL products and services, the AAL market value and size, its trends and key drivers, as well as additional information to describe the interoperability and standards' needs, the main players and the main investment-related activities in the AAL field.

To collect information on comparable initiatives and then derive meaningful conclusions and actionable recommendations, the study team conducted a limited number of in-depth interviews with organizations directly involved in managing existing similar endeavours in different areas than the AAL. A more detailed picture of the methodology used in the study can be obtained in 5.1 and the Annex 1 of the present document.

Definition of the AAL Market

There is no doubt that the AAL market is growing beyond its traditional boundaries and this is attracting a growing interest by potential investors, the ICT industry and all service and care providers. The double factors of demand pull (by the rapidly growing population of the elderly) and technology push (developing new ICT solutions and services) are combining to deeply modify the very landscape of the market.

The AAL is evolving towards an "umbrella" market, rather than a single consolidated market, assembling a wide variety of products and solutions. The most interesting new dimension is represented by the consumer products and services, creating a private market where there was originally mainly a public market. While this shift from a predominantly public market to a consumer-centric and private market is becoming more visible, there is still no clear shared definition of the AAL market scope as a whole and multiple taxonomies abound.

Broadly speaking, the AAL market includes ICT-based solutions for ageing well at home, in the community, and at work, thus increasing the quality of life, autonomy, participation in social life, skills and employability of older adults. For the sake of this study we have considered the multiple dimensions of the AAL market, including the main technologies used and the three main usage domains:

- To supervise the daily routine, including remote monitoring, ensure IT security;

- To support daily routine, entertainment, communication;

- To support access to care, including emergency response, monitoring of medical parameters, and communication with medical professionals.

The study outlined a vision of the AAL Market Observatory, its scope, its main clients, its promoters, which is presented in the Figure below.

Figure 1 Vision of the AAL Market Observatory
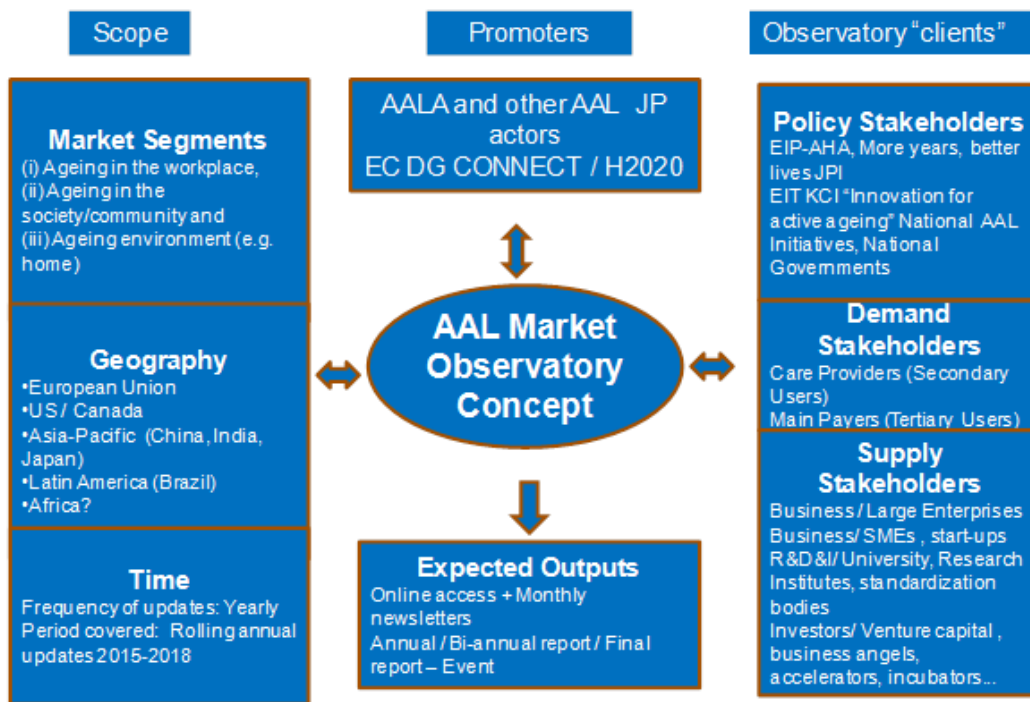
Stakeholder Information needs

Through an intense activity of secondary research (ad-hoc desk research), primary research (in-depth interviews), complemented by a dedicated workshop, the study has examined the information need of a wide variety of stakeholders, from business actors (large enterprises, SMEs and start-ups) to research & development actors (university and other research institutes), from health and care provider associations to investors, venture capitalists, business angels and policy makers.

The majority of stakeholders agree that the lack of information and transparency can influence negatively the development of the market, particularly in Europe; this concern was voiced in particular by researchers and national/regional associations, whereas businesses tended to adopt a more conservative stance. The most relevant barriers to market growth mentioned by stakeholders are directly related with the lack of market intelligence. Surely lack of awareness should be fought with better information and communication; the policy and economic leaders who do not provide sufficient support must be convinced with facts and trends; the availability of clear business cases and evidence on social benefits would help to make investment decisions. A Market Observatory would help to fill these information gaps.

While our research shows common information needs by all stakeholders, going more in depth we find also different priorities, correlated with their role in the market. For example, health and care providers are particularly interested in

trusted information about actual implementations and the benefits achieved, while business actors prioritize the analysis of emerging demand and research actors look for information about funding sources. We have documented these different priorities by category of stakeholders.

Assessment of Data availability and quality

The assessment of data availability and quality carried out through the desk research in Europe and the main world regions provided clear, but unsatisfactory results. The requirements of a Market Observatory for data covering all of Europe, regularly updated, of high quality, transparency and reliability are only occasionally fulfilled.

A total of 143 documents and/or websites related to Ambient Assisted Living were identified as relevant to Monitoring the AAL Market Evolution in the EU. In these documents there were numerous references to Monitoring the AAL Market Evolution in the EU in these documents, in particular:

- 53 documents containing relevant data on actual and potential demand;

- 58 documents containing relevant data on market value and size;

- 59 documents containing relevant data on market trends and drivers of evolution.

21 documents containing relevant data on interoperability and standardization issues

Concerning the market and main players monitoring areas in Europe the main considerations are the following:

- There is a high number of information sources and reports, providing quali-quantitative information and data, but they follow a huge variety of taxonomies and market segments definitions;

- The only category of data fully available and covered by statistical offices is demographic data on potential demand; this is complete, with full coverage of the EU28, and regularly updated;

- The main sources of data on market size, value, take-up and actual demand, market shares of the main players are private market research companies; this means that data are only partially public, methodologies are not fully transparent, and data are not necessarily regularly updated;

- We have examined the different typologies of data and suggested actions to fill the gap. They require establishing partnerships with various groups of stakeholders to get their collaboration to extract data, or in alternative to carry out original data collection and field research to generate new market data.

For these typologies of data the situation is similar in the other world regions, even though in the US and Canada there is certainly more and better information, it is difficult to use it for comparative purposes.

Concerning the availability and quality of data on investment developments, including funding initiatives, investment facilitators, M&A and start-ups:

- There are many specialised databases and data sources with a global coverage (not only Europe) such as CrunchBase, Venture Deal and others. However, they do not usually offer ready-made information on the specific AAL field. This information can only be extracted through ad hoc research.

Analysis of comparable Web portals

To investigate sustainable business models we selected 16 initiatives, of which 8 active in the AAL market space and 8 which could be defined as Market Observatories (such as EITO or the Cluster Observatory). While this is a small sample compared to the Internet world, it is sufficient to provide a good picture of the main challenges faced by online Observatories and how they can be dealt with. Additional information on comparable Web portals can be found in 9.1 and Tables 32 and 33.

Based on our analysis, the main common challenges appear to be the following:

- Designing an appropriate mix of content and services responding to the targeted audience needs;

- Managing the collection, aggregation, presentation and delivery of value-added content, within the cost-benefits balance of the revenue model;

- Achieving visibility in the crowded internet world;

- Managing the interaction with the online community/visitors of the website and delivering good quality services.

Interestingly enough, there do not appear many different solutions to these common challenges. Broadly speaking we found two main business models:

- Providing open access to free content to gain visibility; costs are paid for by the owners of the website who gain other benefits (for example selling other services, such as market research), or are no-profit organizations who include the website in their communication activities (sponsorship model).

- Providing some free content, but mainly value-added content and services with access restricted to the targeted professional community, sustained by subscriptions or selling data.

We did not find evidence of websites sustained by advertising only, which is the mainstream revenue model on the Internet. The reason is probably because these initiatives do not so far address the mainstream consumer market and their attractiveness for advertisers is not high.

Suggested Strategies for the AAL Market Observatory

We wish to suggest two possible alternative models for the AAL Market Observatory:

A. The AAL Market Observatory mission is to become the main reference source of trusted and high quality information and data on the market.

The value proposition of this Observatory will be to provide value-added information and services suited to the needs of each of the main stakeholder categories in the professional stakeholder community, enabling them to make informed investment decisions and promoting the development of the European industry in the field.

The main offering portfolio should include:

- A library of coherent and updated data covering the four main monitoring areas identified as core by the study, including:

- Monitoring the Market evolution in the following sections:

  > Monitoring the main players in Europe and the world;

  > Monitoring the market evolution in the US, Canada, China, India and other relevant world countries;

  > Monitoring investment-related developments including:

- The Observatory data will be provided for the total EU and possibly for individual MS. There will be links to national level reports and sources. Additional online services should be offered, including a showcase of emerging solutions and new company business ideas.

- The organization of an annual event for the stakeholder community with prizes for the most innovative companies, to be selected through an evaluation methodology developed by the Observatory managers and voted on by the stakeholder community.

The business model of the Observatory should be based on a mix of sponsorship and pay-as-you-go services. In the start up phase there will be high costs to design and launch the Observatory, establish the services, open and run the website, launch a communication campaign. In this phase the costs should be covered by sponsors. The Observatory should be run by a professional organization and a scientific steering committee revising once a year the methodology approach and the quality of data and information published.

To produce data the Observatory will use the following methods:

- Automated data collection on the Internet and data analytics to provide periodically updated information for all monitoring areas;

- Networking with other existing portals and sources;

- Ad-hoc field research only to assess the market current and forecast value and the addressable market (potential demand) once a year, to feed into an annual report;

The Observatory should start with a staged approach, developing a core set of data and services and then gradually expanding. It will be important to grow gradually and adjust to the audience reactions, particularly the interactive services. A starting point could be to focus on Europe and the core market development data, adding the data on market players on the second year.

B. **The AAL Market Observatory as a digital catalogue of all the main sources of data and information on the market.**

The mission is to become the best known digital catalogue and content aggregator of the AAL Market – something like the Huffington Post for AAL.

The value proposition is to be a user-friendly single point of access to databases and news on the AAL market, through extensive partnerships and links to main data sources, and to publish lively blogs, posts and comments to data in the main EU languages. This Observatory will also aim at supporting the ICT stakeholders in making informed investment decisions, but use different means, focusing more on the communication and interaction with the stakeholder community. The "blog" approach could be similar to that of the "Aging in Place" US blog.

The offerings should include besides the market data, the services for stakeholders such as a showcase of emerging solutions and a virtual meeting place.

The business model will be low cost, based on gathering free available data and partnering with other stakeholders to link their databases. The Observatory should establish immediately partnerships with the main stakeholders with relevant databases and look for sponsors willing to provide some funding in exchange for visibility and perhaps even some advertising. This type of observatory is by definition open access and free content. It could also join forces with news sites and blogs.

The Observatory should assemble a sufficient volume of links and data sources before becoming active. These types of digital catalogues are immediately discarded by Internet users if they do not show good content from the start.

The start up phase will need to be covered by the EC perhaps in combination with a few other sponsors. However the managers should immediately look for other sponsors and supporters to move towards sustainability.

The Observatory should launch a communication and media campaign to insure its visibility and become known to the main stakeholders, with a "big bang" approach rather than a gradual growth. The communication and media campaign should also push the annual communication event, leveraging all social media channels.

A summary view of the two alternative models

The two models of Observatory have different strong and weak points which are briefly summarized in the table below and commented here.

Satisfaction of stakeholders' information needs

There is no doubt that the "reference source" model would satisfy the main information needs expressed by the main stakeholders, particularly the demand stakeholders because of the focus on trusted and validated information and data and the support to share and compare information.

The second model the "digital catalogue" would provide a one-stop entry point and easy access to all relevant information and data, but would not provide comparability, quality control and validation. Therefore it would satisfy some information needs, especially those of investors and start-ups interested in showcasing emerging solutions and business ideas, but would not satisfy completely the demand stakeholders and the policy makers.

Both models would provide a collaborative platform and interaction support, with the first focused on the professional community and the second less structured and therefore more open to spontaneous interactions and contributions.

Communication and media impacts

The "reference source" model is more oriented towards visibility within the professional community. The investments would focus more on the production and presentation of data rather than building up the image. The second model would have higher communication and media impacts since it needs to build immediate visibility and links to implement its "digital catalogue" model.

Quality and reliability of data – Variety of data

These two aspects are opposite. The "reference source" would focus on quality and reliability and therefore screen/exclude data and information of low quality, even if would mean not covering some subjects or areas. The second model is open to all data because it does not provide any screening and quality control, it simply provides access to data.

Showcasing new businesses

We believe that this service is key and necessary for both models. The type and approach would change given their different approaches; the "reference source" would manage the process of selection of new business ideas and keep them to a standardized template, while the "digital catalogue" would provide only minimal screening and require minimal presentation standards.

Start-up investments and Operational costs

While it is difficult to estimate exactly the level of start-up costs, they will probably be higher for the first model, whose structure is more complex and with a wider offering portfolio. The design and start-up of the online platform is a common element. However the operational costs of the first model will be higher because of the ongoing need for data collection, ad-hoc research, and elaboration and quality control of data. The second model will have higher communication costs in the start-up phase but much lower management costs in the operational phase.

Business model sustainability

Both models are potentially sustainable. The "reference source" model however will required higher revenues sources to become sustainable, because of its higher ongoing operational costs, and will probably always need sponsors. The "digital catalogue" model will require lower revenues and might even exploit advertising, so it has a higher chance to become self-sustainable.

Recommendations

- There is an objective need for better information and data on the AAL market and its evolution, requested by all stakeholders. Therefore the AALA should proceed with its plans for a Market Observatory targeted at the professional stakeholder community.

- The Market Observatory should cover the four areas identified as necessary and sufficient to provide market intelligence: they are monitoring the market evolution in Europe, monitoring the main players, monitoring the investment-related opportunities, monitoring the market evolution in the rest of the world, in order to provide comparisons with Europe.

- In our opinion, the optimal format to develop the Observatory is the first one (model A) with the mission to become the main source of trusted and high quality information and data on the market. Its combination of data and online services guarantees to satisfy the information needs of stakeholders and to support their informed decisions. It does require a high level of investment, particularly in the start-up phase. The combination of products and services should be tested in such a way to progress towards sustainability through also pay-as-you-go services.

- The alternative model (the AAL digital catalogue) is lighter in structure, with a narrower focus, and lower costs (since it excludes ad-hoc research to create the missing data). Therefore it could achieve sustainability faster. This second type of Observatory will also satisfy the needs of stakeholders, even if with less quality and at a lower level of reliability (since all the data is collected instead of produced).

1 Introduction

This document presents the Final Report of the preliminary feasibility study for a market observatory in the Ambient Assisted Living (AAL) field, which has been awarded to Kurt Salmon and IDC by the evaluation committee of the AAL Association on 17th February 2014.

This report presents the final results of the study for discussion and feedback from the AAL Steering Group, including:

- The main findings about the state-of-the-art of data availability and quality, the presence of similar initiatives outside Europe, the relevance of missing/problematic data and the contingency plans suggested to fix the main problems;

- The main findings about the main stakeholder information needs, their expectation and willingness to cooperate with the Observatory, collected through the workshop and the interaction activities;

- Presentation of potential trade-off choices between depth and coverage of data versus feasibility and sustainability requirements of the Observatory;

- Recommendations about the optimal format of the Observatory suitable to respond to the AAL Programme requirements and to satisfy the main stakeholder needs.

This report considers the discussions with the project team and the project steering committee and incorporates the AAL Association's feedback as provided during the kick-off meeting in Brussels on 24th March 2014, as well as the results of the workshop with stakeholders on May 22, 2014.

1.1 Background and context

The Ambient Assisted Living Joint Programme (AAL JP) is a funding instrument (art.185 TFEU) , that is a public-public partnership between the European Commission and the Member States aimed to enhance the quality of life of older people and strengthen the industrial base in Europe through the use of Information and Communication Technologies (ICTs). It carries out its mandate through the funding of transnational projects (at least three participating countries) that involves small and medium enterprises (SME), research bodies and user's organizations (representing the older adults).

The AAL Joint Programme has three specific aims:

- Foster the emergence of innovative ICT-based solutions for ageing well at home, in the community, and at work, thus increasing the quality of life, autonomy, participation in social life, skills and employability of older adults.

- Create critical mass of research, development and innovation at EU level in technologies and services for ageing well in the information society.

- Improve conditions for industrial exploitation by providing a coherent European framework for developing common approaches and facilitating the localization and adaptation of common solutions which are compatible with varying social preferences and regulatory aspects at national or regional level across Europe.

At the current stage, the AAL Programme finances 150 innovation projects across Europe and the objective of the AAL JP is that the innovative ICT based solutions resulting from the AAL projects enter the market within 2 to 3 years after the end of the funding period, bridging the gap between research and innovation.

This report is framed in the context of the support action of the AAL JP titled "Study concerning a Market Observatory in the Ambient Assisted Living field". The overarching objective of the Market Observatory is to give stakeholders a better understanding of the markets in the field of AAL at the local and international levels. This Observatory should provide "Market intelligence support" on AAL products and services all along the project lifetime, since the proposal application to the market replication of the project results.

The Market Observatory is intended to facilitate the broad community of stakeholders (business entrepreneurs, investors, researchers, end users, interested people, public administration, etc.) the monitoring of the evolution and find relevant information in field of "ICT for ageing well market". In concrete information about all major investments related developments (IPOs, mergers, new entrants), new products and services in respect to the growth of the "ICT for ageing well market". This to help the supply and demand side actors to find information and take sound investment decisions.

1.2 Objectives and scope of the Study

This study is organized in the context of the supporting activities of the AAL JP, with the ultimate goal to enhance the market orientation of the Programme and to contribute to bridge the gap between R&D&I and successful commercialisation of new solutions. To do so the AALA aims to set up a Market Observatory on Ambient Assisted Living providing market intelligence support on AAL solutions to the broad community of stakeholders, targeting all stages of AAL projects lifecycle (from project design to commercialisation). The present call objective is to carry out a preliminary feasibility study on this Market Observatory, defining its optimal scope and approach, the type of data needed, its availability and quality, and how to insure its sustainability. The preliminary study will take into account the requirements and inputs of the main stakeholder categories, through selected consultation and interaction.

The proposed methodology and specific objectives of this preliminary study therefore depend on our understanding of the AALA vision of the planned Market Observatory and its specific objectives, in order to insure its capability to respond to the main requirements of the Programme.

As indicated by the tender specifications, the main goal of the Market Observatory will be to provide market intelligence for the main stakeholders by:

- Monitoring the evolution of the "ICT for ageing well" market, with a focus on take-up of new solutions and potential users;

- Identifying the major market players in the EU and the world, deriving information on main consumers profiles, providing information about major investment-related developments (IPOs, mergers, new entrants) in Europe and the world;

- Comparing regularly the evolution of the main European, Asian and American markets;

- Disseminating and sharing its results with the stakeholder community though the publication of regular newsletters and periodical reports, and/or other communication channels (such as social media);

Data related to Ambient Assisted Living is needed by a wide variety of supply and demand actors to support sound investment decisions and ultimately to bridge the gap between research and the market. The AAL Market Observatory, as envisaged will complement the planned information portal about ICT and ageing well which is designed to provide better information about available solutions. Therefore, this preliminary study will have the following objectives:

- To identify the main typologies of data necessary to inform the AAL Market Observatory, based on clear and coherent definitions of the AAL market scope, stakeholders and expected evolution in the next years (2015-2018);

- To assess the state of the art of the availability, validity and reliability of the necessary data in Europe and worldwide, including the identification and classification of the main data sources;

- To assess the gaps and problems in the availability and feasibility of data collection, providing contingency plans to compensate them in order to insure the proper functioning of the Observatory;

- To consult a representative group of key stakeholders to take into account their main information needs/requirements as well as assess their potential support/ willingness to feed data into the Observatory. This will be based on selected interviews, online consultations and a workshop;

- To draw conclusions and recommendations about the optimal format of the Observatory to respond to the Programme requirements, and the potential trade-off choices between data needs, depth and coverage versus feasibility and sustainability requirements.

2 Approach to the definition of the AAL Market

This section outlines the approach used to define the AAL market, in order to select the most relevant information and data needed for the AAL Market Observatory.

2.1 Market Definition

Until a short time ago, the Ambient Assisted Living market was considered fundamentally a niche market combining telecare, home automation and telehealth services, mostly paid for by social services, care providers and hospitals. There is clear agreement that the market is growing far and beyond these boundaries, driven by the main following trends:

- Demographics, creating the ageing society with an increasing number of Europeans over 65 creating new demand for independent living services ;

- The increasing costs of long-term care, creating demand for home-based services for the elderly, paid for by consumer «out of pocket » money rather than welfare or insurance.

- The availability of new technology solutions enabling new applications and services for independent living, from wearable sensors connected through the Internet of Things to iPhones tailored to elderly usability.

2.1.1 The Public-Private Market Shift

The market trends outlined above are making the AAL field evolve towards an "umbrella" market, rather than a single consolidated market, assembling a wide variety of products and solutions. The most interesting new dimension is represented by the consumer products and services, creating a private market where there was originally mainly a public market. While this shift from a predominantly public market to a consumer-centric and private market is becoming more visible, there is still no clear shared definition of the AAL market scope as a whole and multiple taxonomies abound.

The AAL market is based on ICT-based solutions for ageing well at home, in the community, and at work, thus increasing the quality of life, autonomy, participation in social life, skills and employability of older adults. More specifically the three main end-user environments can be classified as follows:

- Ageing in the workplace: the use of ICT to reduce the impact of physical and cognitive barriers to enable elderly population to stay active and productive for longer.

- Ageing in the society/community: the use of ICT to reduce the impact of physical and cognitive barriers to ensure the active involvement of the elderly population in the community/society and guarantee access to services.

- Ageing environment (e.g. home): the use of ICT to manage the promotion of health and well-being, including the Prevention and Management of NCD (non-communicable diseases) and the management of physical and mental fragility and other impairments.

These three end user environments clearly differ in terms of technology usage patterns and demand dynamics. If we consider the Health and Well Being value chain, which is structured in three main stages (prevention, cure and care & health conditions management) we notice that demand drivers in the home environment cover all three of these

stages, while the demand drivers in the work environment and the community/society environment are likely to be focused more on the prevention and care health conditions management domains, rather than on cure.

For the sake of this study, based on the taxonomy of solutions developed in the AAL program, we have developed a demand-side view of the market based on the Health and Well-being value chain, as shown in the table below.

Table 1- The Health and Well-being Value Chain

Usage domains	Health and Well-being value chain		
	Prevention	Cure	Care & Health conditions management
Home	✓✓	✓✓	✓✓✓
Work	✓✓✓		✓✓✓
Community	✓✓✓	✓	✓✓✓

Source: IDC Health Insights 2014

In order to drive the desk research, we have developed further the definition of these usage domains and end user environments, as shown in the tables below.

Table 2 Usage domains – Supervise Daily Routine

Solutions areas	Usage domains – Supervise Daily Routine		
	Personal/ family environment	Work	Community
Monitor and prevent personal injuries	Video, weight, wearable and indoor location sensors to be combined to detect risks of personal injury		
Protect the environment physical security	Intrusion detection alarms		
Monitor environmental safety	Fire, smoke, temperature, light humidity and other sensors and actuators to be used to maintain ideal conditions	Make public health/ environment data available via mobile devices	
Prevent fraud	Identity management solutions, business intelligence solutions	Identity management solutions, business intelligence solutions, call centers, emergency service	
Ensure IT security	Encryption, malware, anti-spam and other IT tools		

Source: IDC Elaboration on BRAID project taxonomy

Table 3 Usage domains – Support Daily Routine

Solutions areas	Usage domains – Support daily routine, entertainment, communication		
	Personal/ family environment	**Work**	**Community**
Mobility	Robots and elevators that support movement	Robots and elevators that support movement	Intelligent transportation systems
		Telework	Connected cars
			Information on conveniently accessible public transportation
Participation in sport/ wellness	Robots		Robots
	Augmented reality		Augmented reality
Participation in cultural and social events	e-Ticketing		e-Ticketing
	Augmented reality		Augmented reality
			Robots supporting mobility at the site of the event
Shopping	E-commerce/ m-commerce		
Connecting with friends and acquaintances	Social media		
	Collaborative tools		
	Affective computing		
Ergonomics of physical assets and ease of use virtual solutions	Hearing aids and Braille readers (as well as glasses and other visual aids) speech to text and text to speech convertors, smart appliance with accessible interfaces – e.g. unified interfaces for household appliances to be controlled via mobile		Smart appliances with accessible interfaces

Source: IDC Elaboration on BRAID project taxonomy

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Table 4 Usage domains – Access to Care

Solutions areas	Usage domains – Access to Care		
	Personal/ family environment	**Work**	**Community**
Emergency response	Multichannel emergency services platforms (online, call center and social media) Affective computing		
Monitoring of medical parameters	Telemedicine		
Two way communication with medical professionals	EHR and clinical decision support systems		
	Social media		
	Collaborative tools		
	Affective computing		
Two way communication with social care professionals	Social care records and case management systems		
	Social media		
	Collaborative tools		
	Affective computing		
Two way communication with informal care-givers	Social media		
	Collaborative tools		
	Affective computing		

Source: IDC Elaboration on BRAID project taxonomy

However, also this segmentation proved insufficient to capture the complexity of the AAL market and was partially criticized at the stakeholder workshop, where different market classifications were offered, for example the following one:

- a. Telecare (daily routine monitoring);

- b. Telehealth (vital sign monitoring);

- c. Access to care, segmented into:

  - > Health Care (doctors, nurses, entourage);

  - > Wellness & Lifestyle (sport/wellness…);

  - > Social Care (social events…).

Another EU study[1] looking at AAL technologies produced the following classification:

Communication devices, Devices that compensate sensory impairments, Telemedicine and telemonitoring, Smart home and daily chores products, Medical assistive technologies, Safety and security products, consumer electronics/multimedia.

There remains however the difficulty to assess how to define the part of the consumer electronics/ multimedia market which can be defined as falling under AAL.

Unfortunately the stakeholders were unable to agree upon the definition of the market, also because of its rapid evolution.

In order to capture all the complexity of the AAL market scenario therefore we have taken the previous definition as a starting point but have also taken into account a technology view, based on the technology stack supporting the AAL solutions (see following Figure).

Figure 2 The AAL Technology Framework
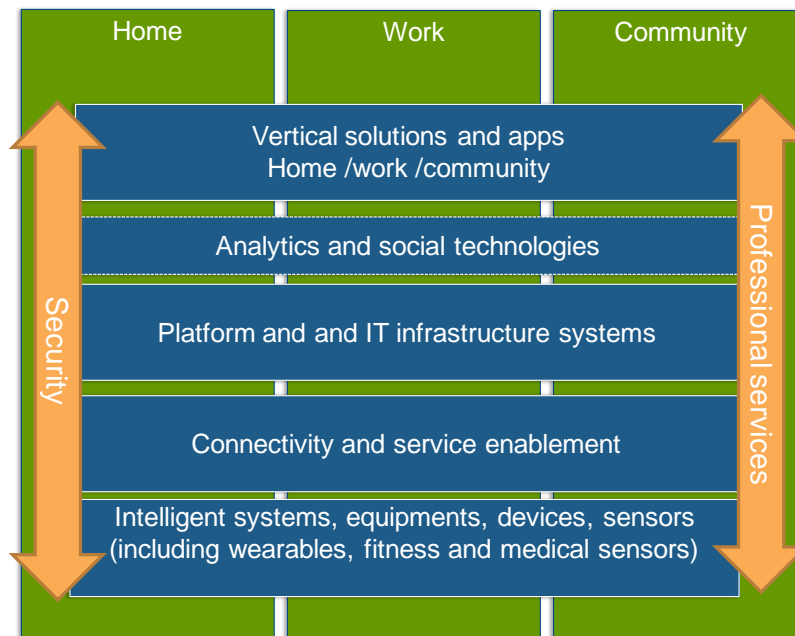
This technology framework integrates and highlights the contribution cloud, mobility, social business and big data and analytics (and of the IoT paradigm) in the AAL market. It shows interactions and interdependencies of the different vertical and horizontal technology components. More specifically, the three bottom layers of the framework (Intelligent systems, connectivity, platforms) include horizontal technologies and products not necessarily specific to the AAL market; the analytics and social technologies layer includes general purpose solutions which may be specifically adapted to the AAL market: the last layer includes the vertical solutions and apps specifically designed for the AAL market. However, only their systemic integration supports the complete AAL solutions and there may be personalised solutions at all levels of the framework. For example, some devices and sensors can be specifically designed for this market.

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[1] ICT enabled independent living for elderly" A status-quo analysis on products and the research landscape in the field of Ambient Assisted Living (AAL) in EU-27 - Dr. Katrin Gaßner, Michael Conrad, VDI-VDE

The US study "Technology for aging in place", recently updated, presents a view of the ICT for aging market which is less focused on the usage domains but identifies the main products segments, as shown in the Figure below.

Figure 3 Technology for aging in place - usage domains
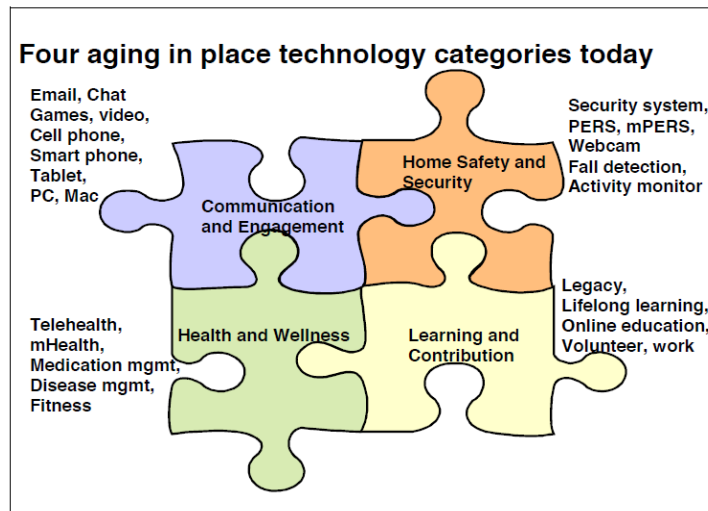
Predictably, in our desk research we have found plenty of material and reports concerning most of these sub-segmentations of the market, but without a coherent, consolidated approach. Therefore we believe that at this stage it would be important also for the Market Observatory to maintain an open and flexible approach to the market scope and definition.

2.2 Outline of the potential AAL Market Observatory

The study was driven by an initial vision of the potential AAL Market Observatory, used to focus the data collection and the analysis. In the Figure below we have outlined the main components of the Observatory which have driven the selection of the core monitoring data,

Figure 4 Vision of the Market Observatory

Scope	Promoters	Observatory "clients"

Market Segments
(i) Ageing in the workplace, (ii) Ageing in the society/community and (iii) Ageing environment (e.g. home)

AALA and other AAL JP actors
EC DG CONNECT / H2020

Policy Stakeholders
EIP-AHA, More years, better lives JPI
EIT KCI "Innovation for active ageing" National AAL Initiatives, National Governments

Geography
•European Union
•US / Canada
•Asia-Pacific (China, India, Japan)
•Latin America (Brazil)
•Africa?

AAL Market Observatory Concept

Demand Stakeholders
Care Providers (Secondary Users)
Main Payers (Tertiary Users)

Supply Stakeholders
Business / Large Enterprises
Business/ SMEs , start-ups
R&D&I/ University, Research Institutes, standardization bodies
Investors/ Venture capital , business angels, accelerators, incubators...

Time
Frequency of updates: Yearly
Period covered: Rolling annual updates 2015-2018

Expected Outputs
Online access + Monthly newsletters
Annual / Bi-annual report / Final report – Event

The main elements of the Observatory are the following:

• The priorities and expectations of the promoters, namely the AALA and the other main partners of the AAL JP, as well as DG CNECT as one of the main financial supporters of the Programme within the H2020 Programme;

• The scope of the Observatory in terms of market segments, main technologies, solutions, geography, and time period that the data should cover.

• The identification of the main stakeholder groups who will be the « clients » of the Observatory, in order to investigate their main information needs and data provision capabilities. They are segmented in 3 main groups, the Policy makers, the Demand actors, and the Supply actors, and are presented in the next chapter.

• The expected outputs of the Observatory, again anticipated in terms of our understanding of the Observatory concept.

Based on these elements, we developed an initial "wish list" of data, which was researched and assessed as presented in the following chapters.

3 Main Findings on Stakeholder needs

Data related to Ambient Assisted Living is needed by a wide variety of supply and demand actors to support sound investment decisions and ultimately to bridge the gap between research and the market. At the start of the process leading to the present preliminary feasibility study, we formulated a few hypotheses on the key stakeholders active in the market and we anticipated that not all of them to be dynamic contributors and users of the Observatory.

3.1 Key AAL Stakeholders and their Classification: Preliminary Hypotheses

In the beginning we distinguished between demand-side stakeholders and supply-side stakeholders. Among the former we included:

- Primary end-user, which is the person who actually is using an AAL product or service, a single individual, "the well-being person". This group directly benefits from AAL by increased quality of life but is not likely to use the Observatory.

- Secondary end-users, which are persons or organisations directly being in contact with a primary end-user, such as formal and informal care persons, family members, friends, neighbours, care organisations and their representatives. This group may benefit from the information and data of an AAL Observatory, especially in the case of healthcare, social care providers and advocacy groups reducing the needs of primary users through AAL solutions. Other service providers such as utilities are likely not to be interested in an AAL Observatory.

- Tertiary end-users, which are such institutions and private or public organisations that are not directly in contact with AAL solutions, but that somehow contribute in organizing, paying or enabling them. Their interest in the AAL Observatory Within this group, government administrations, insurance organizations, and national health funds are likely to have a stronger focus on AAL than pension funds.

On the Supply side we identified the following main stakeholder constituencies:

- Business actors (Large enterprises and SMEs);

- Research and Development actors, including university and clinical research, private and public research institutes, foundation, standardisation bodies;

- Investors, including venture capitalists, accelerators, incubators, technology clusters or scientific parts.

In terms of information needs, we anticipated that these stakeholders are likely to show a higher interest in an AAL Observatory than the demand-side players identified above.

3.2 AAL Stakeholders and their Information Needs in Practice

In the course of the study, we conducted an intense activity of secondary research (mainly through ad-hoc desk research) and primary research complemented by a stakeholders' workshop. Preceded by a preliminary surveying, and a careful selection and recruitment, the workshop brought together a group of highly qualified and relevant stakeholders in the AAL field across Europe and among a wide range of different organizations (industry associations, large businesses and small & medium enterprises, health and care providers, policy makers, research &

development organizations, academia, public and non-for-profit organizations, etc.) to collect their views and feedback on the preliminary study results and the implementation of a Market Observatory in the AAL field. In particular, the workshop called together stakeholders from these types of organizations:

- Business actors, with large enterprises, SMEs, and start-ups;

- Research and Development actors, including university and clinical research, private and public research institutes, foundation, standardisation bodies;

- Health and Care provider associations;

- Associations, such as regional and local e-Health innovation centres, national e-Health foundations, and e-Health centres;

- Investors, such as venture capitalists and business angels;

- Policy makers, such as the European Commission, DG Communications Networks and Technologies.

The majority of stakeholders found that the current level of information and data about the AAL market is not coherent enough, nor completed or trustable. Associations and research & development organizations appeared to be particularly sceptical or negative vis-à-vis the level of information available on the AAL market today. Most stakeholders acknowledged that the missing market intelligence could be a constraining factor for a proper development of the AAL market, and a consensus emerged about the potential demand for a AAL Observatory. In particular, researchers and associations were among those who considered the availability of information and data as one of the most relevant factors for the AAL market's development in the coming years, whereas businesses showed a lukewarm approach in this respect.

The discussion highlighted the differences of opinions among the main stakeholder categories about the potential role of the AAL Market Observatory and their own data and information needs. In particular:

- Researchers and start-ups would be interested in information and intelligence about emerging technologies and solutions, potential demand, and potential funding sources;

- Care providers and service providers would be interested in sharing information, mutual validation of solutions, and practical information about what works and what does not work, which solutions are mature and proven, and about the business cases;

- Policy makers and programme leaders would be interested in overall information about the market dynamics and diffusion and exploitation of AAL technologies;

- Finally, there was general agreement that the forthcoming Market Observatory should not duplicate existing initiatives, but act as a networked portal providing an access point to other websites and online resources.

4 Identification and Classification of Data for the Market Observatory

It is important for the process of identifying and classifying data for the Market Observatory to accommodate the wide variation of information required to satisfy the needs of all players, regardless of their place on the continuum. In this Chapter we describe the main areas to be monitored, typologies of the data to be gathered, descriptions of the data, and the means of determining relevance. These will act as the key tools for identifying and classifying the data that will populate the Market Observatory.

4.1 Monitoring the Evolution of the AAL Market

As the previous chapter indicates, the AAL market is complex and multi-dimensional with data needs that are divergent, depending on the user group. In itself, this makes identification and classification of data needs somewhat problematic. To further complicate matters there are differences of opinion about the market, its scope and how it should evolve, depending on the players and their place on the continuum between research and commercialisation. As the figure below indicates, current market players generally favour expansion of the existing industry sector, whereas researchers and policy makers favour the development of new market niches created by new solutions. There will be various degrees of success and failure along the entire continuum, with both extremes meeting in the middle in many cases.

Figure 5 Technology preservation versus disruptive innovation[2]

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[2] Clayton Christensen, http://www.claytonchristensen.com/
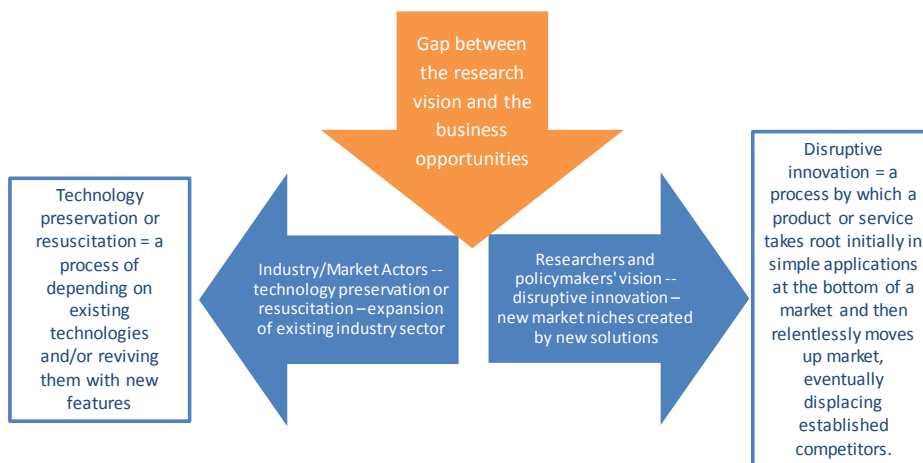
4.1.1 Main areas to be monitored

The AAL Observatory is intended to provide market intelligence support on AAL solutions to the broad community of stakeholders, targeting all stages of the project lifecycle (from project design to commercialisation). The core monitoring areas shown in Table 5 provide the framework for the type of data that would be of most benefit to the Observatory and the stakeholders.

The core monitoring data described below provide insights into the core monitoring areas. Based on our expert opinion, the proposed categories of core monitoring data are both necessary and sufficient to track the market evolution and provide a good overview of the main trends to be monitored. These data have a high level of relevance for the objectives of the Observatory.

In addition to the core monitoring data, there is a wide range of additional monitoring data that help to define and assess the characteristics of the AAL market, such as those presented as examples in Table 5 that will add value to the Observatory. Assuming there is sufficient relevance and validity these data could potentially be useful as proxy indicators in the event that core monitoring data is incomplete.

The classification schema described above, was used to inform the development of the overall Market Observatory data framework and also to support the desk research activities undertaken to complete the current study.

Table 5 Classification and Description of Core Monitoring Data and Additional Monitoring Data

Core Monitoring Area	Core Monitoring Data	Additional Monitoring Data
Monitoring the AAL Market evolution in the EU	**Actual and potential demand**: Data on actual/potential users (demographic data, user segments and profiles	Socio-demographic indicators, Internet use, technology orientation
	Market value and size: Classification of solutions and data on level of use and diffusion of AAL solutions, revenues and spending	Main benefits, problems
	Market trends and drivers of evolution: Information on technology trends, emerging AAL solutions (Future products and solutions, forecasts, roadmaps, architectures)	User perceptions, expectations, satisfaction
	Interoperability and standardisation issues: Information on adopted or emerging standards (interoperability and standardization issues)	Related standardization and Interoperability issues
Monitoring the Main Players	**Number and type of main players and new entrants** (overall, by market segment, by category of solutions, by company size)	Main commercial and marketing strategies, emerging business models, time to market
Monitoring the main investment-related developments	**Number and type of market-oriented initiatives**: start-ups, M&A, IPOs, main funding initiatives	Start-up success rates, Investments by market segment / type of product/service
Monitoring the main American and Asia-Pacific markets	**Core data**: indicatively in the US, Canada, China, India, Japan for comparison to EU market evolution	Additional information and data to extend/ contextualise the comparison

4.1.2 Typology of Data

In order to make sense of the vast amounts of quantitative and qualitative data associated with the AAL market and its evolution, a typology of main data was developed using generally accepted data types as the foundation. We anticipate that the three categories – qualitative, quantitative and quali-quantitative data – will be used by the AAL Market Observatory. The following definitions, described in the Inception Report, were applied during the desk research.

4.1.2.1 Quantitative data

- **Definition.** Data collected on a regular basis (by survey from respondents, or from administrative sources) by formally recognized research or government organisation (e.g., National Statistics Office, European Commission, OECD, WHO, Eurostat, UN, Academic Research Organisation) to be edited, imputed, aggregated and/or used in the compilation and production of official statistics.

- **Role in the AAL Observatory.** Official statistics will be used to measure the structural characteristics of the market (such as demographic trends, healthcare spending on GDP, exc.).

- **Pro and Cons.** Official statistics have a very high level of quality and reliability, as well as geographic coverage and comparability (for example for the EU28). But they often do not cover innovative markets, solutions, and/or their segmentation is insufficient to capture all of the characteristics of the market.

4.1.2.2 Market Research data

- **Definition.** Quantitative data sourced by market research organizations to measure the market growth and consumers/businesses preferences and choices.

- **Role in the AAL Observatory.** Quantitative data complements official statistics and fills the gaps on market coverage and segmentation.

- **Pro and Cons.** Market research data is focused but provide broader coverage than official statistics however it may have a lower level of quality and reliability. The transparency of data collection and elaboration methods is critical to insure the assessment of quality.

Market monitoring based on the combination of statistical data with market research data is a very effective approach, as shown by the experience of IDC with other similar projects, for example the design and development of the Digital Entrepreneurship Monitor (http://ec.europa.eu/enterprise/dem/). Within our consortium, IDC is well positioned to verify and assess the quality of quantitative data and look for ideal sources of data for the Market Observatory.

4.1.2.3 Qualitative research data

- **Definition.** In statistics, qualitative data are measures of 'types' and may be represented by a name, symbol, or a number code. In this study we are also interested in qualitative research data resulting from collections of interviews, case studies, or other data collection methods ranging from itemized lists and descriptions to rankings of players, stakeholder profiles and roadmaps.

- **Role in the AAL Observatory.** Qualitative research is easy to find but difficult to assess, and may be in languages other than English. In the preliminary study, we will first try to locate the existing information in English (which should be relevant, given that materials concerning ICTs are most often found in English). Documents in other languages may be provided in their original language (as we do not expect the Observatory to have the means to translate documents), with meta-data of classification in English to facilitate storage and retrieval (for

example title, source, date of publication, scope). Some documentation in local language may be provided by IDC's network of local and regional offices in North America, Latin America, Asia Pacific and Middle East & Africa.

- Within the scope of the Observatory we will carry out a careful selection of the most relevant and significant qualitative data, with a high level of quality. These typologies of data can be used to complement and complete the monitoring activities. Qualitative data as category variables (rankings, itemized lists) will be particularly useful for monitoring solutions and the main players. But we will not be able to carry out a quality assessment on the qualitative data not in English.

- **Pro and Cons.** Qualitative data provide depth and understanding to the market monitoring but are by definition less structured and comparable than quantitative data. Qualitative research results may not have the breadth and coverage of statistical data. The structured analysis of qualitative field research results (such as the longitudinal analysis of case studies or of direct interviews based on the most critical factors) is critical for the quality and meaningfulness of final results. The explanatory power of qualitative field research depends on the selection of the sample based on predefined typologies (socio-demographic profiles for example), which in turn must reflect a good understanding of the universe to be investigated. Qualitative research data (such as case studies or initiatives descriptions) may require translation from other languages to English.

4.1.2.4 Quali-quantitative data

- **Definition.** A combination of qualitative and quantitative variables, for example mapping, cost-effectiveness analysis of investments.

- **Role in the AAL Observatory.** Within the Observatory, the use of interactive maps can be a very powerful way to visualise quantitative data and their correlations with qualitative data, for example within a geo-referenced framework. We will search for existing maps (to be potentially linked with the Observatory, or simply be sources of data) and for the type of data and information which may be suitable for the creation of maps.

- **Pro and Cons.** The use of maps for data visualization is growing, thanks to the possibility of automatic data feeds from other websites. There are several websites acting as data sources using interactive maps, for example the mHealth Connected Living Map[3]. There is a need for careful quality control and assessment of maps to avoid providing ambiguous or even wrong information. Although cost-effectiveness and cost-benefit analysis is usually be applied to specific cases, it can provide examples of emerging business models and their results.

Table 6 is self-explanatory in its depiction of the types and associated descriptions considered appropriate for purposes of organising the Market Observatory data. The typology considers the objectives of the Market Observatory and focuses attention on data that is related to the evolution of the AAL market, rather than a repository for all data that has an AAL connection. The goal is to minimize duplication between the Market Observatory and the AAL Information Portal described in the EC funded Study on Information Portals.[4]

Because much of the data that will populate the Market Observatory is not the result of an EC-funded project it may use different terminology and classifications consequently the "fit" may not be precise. It is important to be open to

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[3] http://www.gsma.com/connectedliving/tracker/

[4] Study on Information Portals in AAL Field: Final Report, February 2014

using the recommended typology as a guide or starting point, but also to keep in mind that the descriptions and examples can be changed to accommodate new types or categories of data as the need arises.

Table 6 - Typology of Main Data

Type	Description	Example
Quantitative data		
Statistical data	Statistics compiled using structured research methods	Official statistics, demographic data (e.g. number of elderly)
Market Research Data	Data on market size, growth and consumers/ businesses preferences sourced by market research organizations or academia	Take-up of specific AAL solutions, product or product category revenue data, market share data, product sales data
Qualitative research data		
Market analysis	Itemized lists and descriptions, case studies	Classification and description of AAL solutions e.g., new solutions, architectures, standards; Classification of the AAL ICT domain, e.g. core technologies, access technologies and end-user applications
Stakeholder analysis	Stakeholder profiles, sociograms, user requirements	Profiles of AAL users by socio-demographic characteristics and roles
Trends analysis	Roadmaps, scenarios	Roadmap of AAL technologies, roadmap of standards
Competitiveness analysis	SWOT, Marketscape, positioning of main AAL players	Positioning of main AAL players
Quali-quantitative data		
Interactive Maps	Graphic representations of information linking spatial relationships and quali-quantitative data	Visualisation of the number of AAL start-ups in Europe by country positioned on an interactive map
Cost effectiveness, Multi-criteria analysis	Systematic analysis and comparison of positive and negative impacts of investments including quantitative and qualitative variables (such as impacts on quality of life)	Data on cost effectiveness of selected AAL solutions

4.2 Monitoring AAL Main Players

Monitoring the AAL market, by its nature, focuses on users and solutions, including the key players operating in the AAL field at EU, national and worldwide level (by selected countries). The study will therefore investigate the existence of AAL product manufacturers and AAL service providers and categorize the research outcomes by market segment, by category of solutions and by company sizes.

Players in the AAL market cover a wide variety of AAL devices and complex solutions and represent a fragmented and heterogeneous group of players. As an example, their offerings range from communication devices (visual telephones, easy to use mobile phones), devices compensating sensory impairments (intelligent electric magnifiers and reading lenses), consumer electronics products specifically adapted for older adults (multimedia applications with age-specific content), safety and security applications (surveillance and locking systems, customized alarm systems) medical assistive and telemedicine technologies (remote health monitoring tools, wireless wearable health solutions), plus other applications to reduce the lack of mobility for elderly people and help them performing daily activities (step-lifts, remote-controlled doors, household appliances with sensors for online services offering teleshopping, etc.).

4.3 Determining the relevance of the data

A key criterion of relevance is directly linked to the needs of the Market Observatory to provide sufficient information so that both supply and demand side stakeholders can make sound investment decisions. The core and additional monitoring data respond to this requirement: by monitoring the market evolution, the main players and the current investment-related developments. This minimizes the risk of investment in research that duplicates solutions that are already on the market. It also allows for identification of emerging markets and new solutions, thus providing potential suppliers and users with support for their decisions about entering a new market. The segmentation of information will allow stakeholders to find the information most relevant to them.

The Observatory, because of its nature as a public source, will never provide the type of specific and detailed information which may be needed by venture capitalists for example, to make a decision about a specific investment. The main stakeholders will always need to add further investigation and analysis to the information provided by the Observatory to make a specific investment decision. To help the stakeholders in this, we suggest that the Observatory add support services to its range of activities (for example match-making between researchers and potential entrepreneurs and business angels); this is not currently within the scope of its objectives.

5 Validation of data availability

The Workshop on the AAL Market Observatory – Identifying Stakeholders' Needs held May 22, 2014 concluded that there is a lack of coherent, trusted and complete information and data about the AAL market. Also, that the market is growing beyond its traditional boundaries therefore its definition is blurred. These factors do play a role in determining the speed at which the market is evolving, however by themselves are not the key drivers or barriers to growth.

5.1 Desk Research Process

The desk research conducted as part of this feasibility study project was intended to validate the availability of data of sufficient quality and relevance to the needs of the AAL Market Observatory. As suggested in the Inception Report, the desk research systematically leveraged data from the following key sources:

- AAL JP documents, the AAL JP projects documents where relevant. Since it is assumed that these documents are already known to the project sponsors, less emphasis was placed on assessing and evaluating them for applicability to the Market Observatory.

- Reports published about the AAL market;

- Websites/documents published by the main AAL partners and national initiatives;

- Official statistics websites, starting with Eurostat, OECD and the national statistical institutes of the main EU MS;

- Ministries of Health and Ministries of Welfare studies, Think Tanks, etc.

- IDC's databases on the main ICT solutions related to the AAL market;

- Public reports by other market research companies, such as Forrester or Frost & Sullivan;

- Sources indicated by the stakeholders during the stakeholder consultation.

5.1.1 Use of Keywords

In order to ensure a broad level of enquiry coverage a variety of keywords and phrases and combinations were used during the desk research, a few examples are shown in Table 7. Over time, these were used in conjunction with other words or in combination with each other. As the search progressed, they were used in conjunction with words or phrases connected with specific technologies or solutions, e.g., sensors, mobile, safety alarms.

Table 7 Examples of keywords used for the desk research

Keywords and phrases	
AAL	Market size
Ageing well	Medical Devices
AL	mHealth
ALT	Remote patient monitoring
Ambient Assisted Living	Smart home(s)
Assisted Living	Standards
Assisted Living Technology(ies)	Telecare
Independent aging	Telehealth
Interoperability	Telemedicine
Market drivers	Telemetry

Input provided by stakeholders during the Workshop was used to identify the keywords and phrases, in order to ensure that the search focused on locating documents and that would satisfy their requirements. The iterative desk research process led to websites and documents that, if they appeared to be relevant, were considered during the analytical process.

Documents, websites and portals were examined immediately they were accessed to determine relevance to the Market Observatory. If this initial examination determined that the document or website was irrelevant, a notation was made that it had been accessed, but no electronic copy was retained either of the document or the link. Documents considered to be relevant were retained or a record of the link to the document was recorded. The relevant documents were subjected to a second examination and, if determined to be irrelevant, they were discarded and were not added to the list of documents included in this report.

5.1.2   Results of the Desk Research on Market evolution and Main Players

A total of 620 points of contact (websites, web portals, documents) were made and 158 were selected for further assessment as part of the EU component of this feasibility study – 143 documents and 15 comprehensive sources of information, e.g., lists, journals, books, websites, databases. Determination of relevance was based on the data's ability to support the Observatory's objectives, i.e., compliance with the definitions of "core" and "additional" data described earlier in this report, and ability to satisfy the needs of both supply and demand side AAL stakeholders.

Given the broad scope of Ambient Assisted Living and the multitude of terms associated with the field, it is not surprising that fewer than 25% of the points of contact were considered irrelevant for a Market Observatory, which has very specific requirements, unlike an Information Portal, for which less restrictive rules of inclusion apply.

5.2   Monitoring the AAL Market Evolution in the EU

The high number of products and services in the AAL market and the high level of diversity in product and service providers continue to drive a market that is complex and very fragmented. The AAL market is dealing with an entirely new ecosystem that requires collaboration amongst a large group of diverse stakeholders. Achieving scale in such a

transnational context poses particular challenges, requiring entrance to different national markets sometimes in very different circumstances.

This makes it extremely difficult to be definitive about its current state and when coupled with the national market differences across the EU this becomes even more challenging. A number of national AAL initiatives, research data about specific AAL solutions, and some EU market commonalities have been explored to develop the following insights into the AAL market in the EU

Using the templates described in previous Chapters of this report, data about the evolution of the AAL market was collected using a variety of key words and phrases that reflected the data selection requirements. As data were located, they were examined to ensure a useful level of relevance and classified according to the Main Measurement Areas for Monitoring the AAL Market Evolution, as shown in Table 8 below.

Table 8 Description of and Rationale for Main Measurement Areas for Monitoring the AAL Market Evolution

	Monitoring the AAL Market Evolution	Description	Rationale
1	Monitoring the actual and potential demand	Data on actual/potential users	Understanding the target market is critical. As a potential investor or product developer, in order to make wise investment and product design decisions, it is important to be informed about the potential users of the product – who they are, where they are, how many of them there are, what are their requirements, what are their financial circumstances, how and where the product will be used, etc. The desk research focussed on locating demographic data, information about user segments and user profiles to satisfy this requirement.
2	Monitoring the market value and size	Data on level of use, diffusion of AAL, solutions, revenues, and spending	How big is the market? Information about the number of buyers and sellers (or potential buyers and sellers), and the amount of money exchanged in a particular market underpin decisions about entering or not entering a market, providing input to the question of whether or not an organization can compete in a particular market.
3	Monitoring the market trends and drivers of evolution	Data/information on technology trends, emerging AAL solutions	How quickly is the market changing? What is influencing the direction of product design and demand? It is important to be aware of the competitive environment and technology trends in order to assess the business or product's place in the market.
4	Monitoring interoperability and standardisation issues	Information on standards adopted or emerging	What role do standards play in the AAL market? Do they present a major barrier to entry for a new product or service? In a field that is directly or indirectly connected to healthcare standards play a critical role and it is important to understand which standards are relevant to a particular product. In today's complex health and social care delivery models, where multi-disciplinary teams and interactions are commonplace, interoperability is taking on an increasingly important role, like standards it is important to understand which issues are relevant for particular products.

5.3 Actual and Potential Demand

Like many other regions around the world, the population of Europe is ageing – the number of people aged over 65 will triple over the next three decades and the number of people aged over 80 will quadruple.[5] Germany and Italy are two countries in the world with the highest median ages and by 2050, Bosnia and Herzegovina, Germany, Malta, Portugal, Serbia and Spain are projected to attain median ages of 50 years or more.[6] At the same time, Europe is

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[5] Network for the Market uptake of ICT for Ageing Well (ec.europa.eu/information_society/apps/.../ 001_D35V002.pdf)

[6] World Population Ageing 2013, http://www.un.org/en/development/desa/population/publications/pdf/ageing/WorldPopulationAgeing2013.pdf

experiencing rapid urbanization and expansion of online services. Although ageing does not necessarily prompt the need for care, many elderly citizens require assistance and support. Therefore, it can be assumed that these trends will have a substantial impact on the way we live, particularly on the elderly and the market for AAL products and services will grow.

In Northern Europe, more than 90 per cent of older persons live independently, according to the Survey of Health, Ageing and Retirement in Europe (SHARE), whereas in Southern Europe (Greece, Italy, Spain and Portugal), less than 60 per cent live independently.[7] This dichotomy drives certain differences in the market for AAL technologies across Europe. However according to a recent Assisted Living Technology study: "Across Europe, the retirement age is rising, putting pressure on governments to provide the right living conditions for the elderly population to facilitate the population's independent living. Along with the increase in life expectancy, there is an increase in the prevalence of mental and physical health ailments among the ageing population. This demographic shift in Europe paves the way for technological innovation to efficiently enhance the living conditions of the aged and physically impaired."[8]

Individuals in need of AAL services are not a homogenous group, and vary greatly in terms of individual specific needs. Developing a good understanding of the customers or target market, i.e., those who will use or buy the services or products in question, is critical to any market analysis. In the case of ambient assisted living, information about the age and health of citizens are two of the most important demographics. According to the European Commission's latest Ageing report[9], the population of the EU will be slightly higher in 2060 (517 million, up from 502 million in 2010). At the same time it will be much older -- the share of those aged 65 and over is projected to rise from 17% to 30%. One of the most affected countries is Germany whose population will be one of the oldest in the world by 2035.[10]

Because the ambient assisted living marketplace is very fragmented, i.e., many products and services, and many potential customer definitions, the demographic data will require further segmentation depending on the stakeholder's particular interests. For example: from a demographic perspective, an organization that is interested in developing an alarm system for elderly residents living in their own homes would need to know how many people in this category exist in the target geographic area. It would also be helpful for the supplier to know the income level of these individuals as well as the type of housing they occupy. Demand would also be influenced by affordability and access to products; consequently it would be very useful for the stakeholder to understand who would be paying for the alarm system, e.g., the actual user, a government or care agency, an insurance company.

These are market *demand* indicators; however it is also important to understand *barriers* to demand and its growth. Consumer perception and attitude may present a barrier, for example the UK Technology Strategy Board suggests[11] that "a key reason for low uptake of Assisted Living Technology (ALT) solutions by older people is a general mistrust and reluctance to use or understand the technology." Affordability and attitudes about who should be paying for the device are also important considerations, for example: a study prepared for the European Commission DG Communications Networks, Content & Technology[12] suggests that the older generation in many former Communist

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[7] Survey of Health, Ageing and Retirement in Europe (SHARE) (http://www.share-project.org/)

[8] Assisted Living Technology A market and technology review (http://microelectronics-inet.co.uk/wp-content/uploads/2013/12/Assisted-living-Research-Report-22-Mar-12.pdf)

[9] The 2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States (2010-2060), http://ec.europa.eu/economy_finance/publications/european_economy/ageing_report/index_en.htm

[10] BMBF-Projekt SELBST: Ein innovatives Dienstleistungskonzept zur Unterstützung älterer Menschen und deren Angehörige. https://www.vde-verlag.de/proceedings-de/453323008.html

[11] ALT Market in the UK - AKTIVE Market Report, UK Technology Strategy Board

[12] Study on business and financing models for ageing well. European Commission DG Communications Networks, Content & Technology. 2011

countries, for example the Czech Republic, is accustomed to free medical and social needs, therefore interest may decline when they learn that they would be required to pay a fee.

5.3.1 Actual and Potential Demand Documents

Fifty-three documents and/or websites related to "Actual and Potential Demand" were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, covered a wide range of topics related to AAL covering a number of countries in Europe as well as other geographies and the broader European and global markets.

Relevant data was presented in a variety of formats and was frequently embedded in a document that covered the topic of AAL as part of a report on the broader assisted living space. The data was relatively recent and very often was available at no cost. The challenge for the Market Observatory would be in trying to maintain the Market Observatory in a current state, because sourcing these documents and websites in an efficient and effective way could be difficult since they are not organized in a way that provides for highly structured or automated capture. Consequently, the data capture process is labour intensive (see Tables in Annex).

5.3.2 Sources of Actual and Potential Demand Documents

As the following table indicates, data about the actual and potential demand for AAL solutions is primarily sourced from Government and Near Government Organizations. Given that demand for AAL products and services is closely driven by the aging society, demographic data is of critical importance. Official statistics are considered by many to be the best source for this type of data; it is not surprising therefore that the primary providers are government and near government organizations.

Market research and consulting firms conduct market research including analysis of actual and potential demand for specific products and services. These reports provide more targeted market demand data, but other than high level summary data presented at public events, it is rarely available at no cost.

Table 9 Main Sources of Demand Documents

Primary Source of the Document	Percentage of Actual and Potential Demand Documents
Government and NGO	34%
Market Research and Consulting Firms	25%
Academia	9%
EU projects	15%
Other (Association, Publisher, Corporation, Advocacy)	17%

5.4 Market Value and Size

Sizing the market is a necessary task for business and marketing planning, and budgeting for all start-ups, especially those that seek third-party financing such as venture capital (VC). Even though their investment philosophies may

differ, most VCs and angel investors would like to know that they are investing in a market with a large potential size (typically, at least $1 billion).[13]

Once the target customer(s) and their number have been identified and an estimated penetration rate has been established, it is possible to estimate the market size for a particular product by multiplying these two numbers. The result would be the size of the target market for that product. However, published market value and size data is a useful guide against which an organizations projections can be compared. Unfortunately, the AAL market in itself is very large; consequently it is extremely challenging to extrapolate the value of the market for an individual product or component, especially if it is a new entrant with no track record.

It should be noted that published estimates of market sizes and definitions of the market vary and the types of technologies and devices may not always be the same. Also, the data may not be specific to AAL; for example, Frost & Sullivan estimates[14] the European ALT (Assisted Living Technology) market for 2009 to be $154.9 million, rising to $525.56 million in 2015. In 2009, Germany was the biggest market with 32.9% market share. Although these data are for the ALT market, take up of AAL is considered by Frost & Sullivan to be a primary driver of growth in that market.

5.4.1 Market Value and Size Documents

Through desk research we located fifty-eight documents and/or websites related to "Market Value and Size" were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, covered a wide range of topics related to AAL covering a number of countries in Europe as well as other geographies and the broader European and global markets.

Market value and size data was often included as part of the lead up to or rationale for the main topic or project described in the document. This does not discount its relevance, but it does add to the challenge of finding the data. For example, it is not uncommon for market value and size data sourced from a market research or consulting firm to be quoted in a research paper.

Since market size and value data are of vital importance to the Market Observatory audience, investing in the acquisition of good data could be the key to ensuring that it satisfies the key objective of supporting wise investment decisions.

5.4.2 Sources of Market Value and Size Documents

As anticipated and as shown in Table 10, data regarding the AAL market value and size is primarily sourced from market research companies (e.g., Frost & Sullivan, IDC) or from EC project reports. Market value and size data is mostly relevant for players in the commercial market; consequently it is not always available from government or near government organizations. However, since the Commission is interested in having a Market Observatory that helps to bridge the gap between research and commercialisation, market value and size data will be of immense value to the users of the Observatory.

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[13] How to estimate market size: Business and marketing planning for startups, http://www.marsdd.com/mars-library/how-to-estimate-market-size-business-and-marketing-planning-for-startups/

[14] Assisted living in Europe technology and market trends 2010, http://www.slideshare.net/FrostandSullivan/assisted-living-in-europe-technology-and-market-trends-2010?qid=000ca65d-bf63-4d33-9486-

Table 10 Main Sources of Market Value and Size Documents

Primary Source of the Document	Percentage of Market Value and Size Documents
Government and NGO	12%
Market Research and Consulting Firms	45%
Academia	5%
EU Project	12%
Other (Association, Publisher, Corporation, Advocacy)	26%

5.5 Market Trends and Drivers of Evolution

The roots of AAL are in traditional Assistive Technologies for people with disabilities, Design for All approaches to accessibility, usability and ultimately acceptability of interactive technologies, as well as in the emerging computing paradigm of Ambient Intelligence, which offers new possibility of providing intelligent, unobtrusive and ubiquitous forms of assistance to older people and to citizens in general.

The evolution of the AAL market in the EU is set against a backdrop of tight business lending, a shaky euro zone recovery and national economies that are struggling to reconcile the growing demand for social and health care with available public funds. Governments are eager to find innovative, technologically advanced, affordable solutions to the challenges this presents, particularly in a rapidly ageing society that will inevitably increase the pressure.

As anticipated in the Inception Report, the most relevant trends to be monitored are driven by the convergence of mobile technologies, remote patient monitoring and social/geolocalisation services. But important innovations are expected by the emergence of augmented reality applications and new generations of wearables (Google glass, smart fabrics), as well as by the use of crowdsourcing and open data approaches in the elderly/ social care/ eHealth community, and the emergence of personalised health systems and the use of technologies for personalised medicine.

The most interesting drivers of new solutions in the AAL market are the following:

- New generation sensors, including passive, wireless sensors that can be worn (e-g- fitness devices, sensor woven into fabrics and even tattooed onto the patient's skin) swallowed, embedded in the body, or placed in the home to support a variety of use cases;

- The convergence between mobile health, telehealth, and social technologies. As mobile technology becomes increasingly more sophisticated, mobile devices are replacing proprietary gateway appliances that provide connectivity to AAL systems. Social media will play an important part in consumer engagement.

- Geo-localization services based on the localisation of the user.

- Last but definitely not least, smart environments based on Internet of Thing (IoT) technologies. IDC defines the IoT as a network connecting (either wired or wireless) devices, or "things," that is characterized by autonomous provisioning, management, and monitoring. The IoT is innately analytical and integrated), driving the emergence of a new generation of solutions in the AAL market. In the next years up to 2020, the IoT is expected to reach a new level of maturity, based on fully deployed Machine-to-Machine (M2M) communication enhanced by Cloud Computing services and advanced networks. IDC considers the emergence of new IoT based digital ecosystems

one of the most relevant innovation trends in the next 5-10 years, with potential impacts ranging from incremental to disruptive innovation for most vertical markets.

5.5.1 Market Trends and Drivers of Evolution Documents

Fifty-seven documents and/or websites related to "Market Trends and Drivers of Evolution" were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, covered a wide range of topics related to AAL covering a number of countries in Europe as well as other geographies and the broader European and global markets.

The documents identified reflect the key directions from which pressure to develop this market is coming – demand from the aging population and technological advances. These two developments are expected to drive growth in the AAL market, however when viewed holistically they represent a very diverse and complex marketplace. Relevant data was presented in a variety of formats and was frequently embedded in a document that covered the topic of AAL as part of a report on the broader assisted living space. The data was relatively recent and very often was available at no cost.

5.5.2 Sources of Market Trends and Drivers of Evolution Documents

As shown in Table 11, data regarding the AAL market trends and drivers of evolution are primarily sourced from market research companies (e.g., Frost & Sullivan, IDC). Along with the market size and value data discussed above, market trends and drivers are presented in detail by the market research firms, with defensible data driven rationale for their projections. Government and NGO organizations also produce a relatively high volume of data on AAL market trends and drivers of evolution – this is unsurprising given the potential impact AAL could have on healthcare delivery.

Other documents present market trends and drivers from a variety of perspectives, e.g. the role of policy is presented by the Government of New Zealand, the increasing incidence of dementia and the role of AAL is discussed by the University of Stirling, and insights into the relationship between working and "active aging" are presented by Studio Corcos - Psicologia delle organizzazioni. It is important to consider the range of trends and drivers of evolution, when considering a market with wide applicability such as AAL.

Table 11 Sources of Market Trends and Drivers of Evolution Documents

Primary Source of the Document	Percentage of Market Trends and Drivers Documents
Government and NGO	14%
Market Research and Consulting Firms	34%
Academia	12%
EU Project	17%
Other (Association, Publisher, Corporation, Advocacy)	24%

5.6 Interoperability and Standards Issues

In March 2010, the European Ambient Assisted Living Alliance Roadmap report concluded that "a common AAL platform based on selected standards which allow the interoperability of applications and services could be the basis for 3rd party service development and provision, and could stimulate the development of products at an early stage and the establishment of value chains that put into effect the business opportunities within AAL. The contradiction

between a user-centred system design and the need for a common application platform approach might turn out to be the central contradiction and challenge for AAL in the years ahead."[15]

The European Innovation Partnership[16] echoes the AALiance"s concern and suggests that the lack of interoperability and standardization present a challenge for the AAL market even though technologies for active ageing and AAL are already available and often in use, most are incompatible, expensive and potentially not sustainable. The Partnership believes that: "The definition, validation and implementation of a global architecture of the AAL ecosystem, that can be applied to other countries, can contribute to accelerate the uptake of ICT solutions for active ageing and AAL across EU, to strength partnerships across the value chain, contribute to the creation of an EU-wide market and to the world leading position of EU industry in this field."

5.6.1 Interoperability and Standards Issues Documents

Industry standards are established rules, regulations, and generally accepted operating procedures, practices and requirements defined by national trade associations, and state and local government laws relevant to a product or service. Technology standards and specifications somewhat different inasmuch as they provide the basis to achieve interoperability, integration, and scalability through standardized protocols and data models. Both types of standards are relevant to the evolution of the AAL market.

Twenty-one documents and/or websites related to "Interoperability and Standards Issues" were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, and were related to countries across the European Union as well as other geographies in the broader global market.

Relevant data were presented in a variety of formats and were relatively recent and very often available at no cost. The documents covered a wide range of topics related to AAL, but the breadth of perspective was significant. For example, IDC covered the topic from the perspective of "wearable" technology, which is expected to have a major impact on this market, VIN-DE of Germany addressed the issue of standards in electromobility, and GSMA addressed the issue of standards to support mobile technology in the smart home. These few examples clearly point out the technical complexity of the AAL market, driven by the broad spectrum of products and components from which it is derived.

5.6.2 Sources of Interoperability and Standards Documents

As shown in the table below, data regarding the AAL interoperability and standards were sourced almost equally from government and NGOs, market research companies (e.g., Frost & Sullivan, IDC), and "other" types of organizations. The latter includes organisations such as the Royal Institute of British Architects (Guide for Assisted Living) and the juried journal Sensors ("SmartMonitor"— An Intelligent Security System for the Protection of Individuals and Small Properties with the Possibility of Home Automation).

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[15] AALIANCE Project (Deliverable 2.7 (ec.europa.eu/digital-agenda/events/cf/ict2013/document.cfm?)

[16] https://webgate.ec.europa.eu/eipaha/initiative/index/show/id/22

Table 12 Sources of Interoperability and Standards Documents

Primary Source	Percentage of Interoperability and Standards Documents
Government and NGO	24%
Market Research and Consulting Firms	29%
Academia	14%
EU Project	4%
Other (Associations, Publishing, Corporations)	29%

5.6.2.1 Comprehensive Sources of Non-Specific Data Related to Monitoring the AAL Market in the EU

In addition to the 143 documents discussed above, 15 comprehensive sources of data were examined and considered to be relevant to achieving the objectives of the AAL Market Observatory. The table below provides a list of these resources.

Table 13 Comprehensive Sources of Non-Specific Data Related to Monitoring the AAL Market in the EU

Name of Source	Type of Resource	Level of Access	Brief Description
AAATE Journal on Technology and Disability	Journal	Restricted -- Included in AAATE membership dues	Collection of basic and applied research papers, review articles, case studies, programme descriptions, letters to the Editor and commentaries
Ambient Assisted Living Documents	Report	Abstract free -- Reports purchase only	List of Market Research reports produced by Frost & Sullivan that respond to the search term "assisted ambient living" -- reports provide market data of all types covering a variety of products
Ambient Assisted Living Joint Programme: Catalogue of Projects 2013	Report	Public	Comprehensive list and description of AAL projects funded by the EC AAL JP as of 2013
Ambient Assisted Living: Italian Forum 2013	Book	Online preview -- Book purchase only	This book presents the refereed proceedings of the Fourth Italian Forum on Ambient Assisted Living (AAL), held in Ancona, Italy, in October 2013. The knowledge and insights provided in this book will help researchers and others involved in AAL to understand relevant societal trends, novel technological developments, and pressing challenges.
BlueSky	Blog	Public	Ongoing posts about the issues associated with aging and facilities and services needed by and provided for the senior community
Comodal (Consumer Models for Assisted Living)	Database	Public	Web portal for The Health Design & Technology Institute (HDTI) activities in support of developing a consumer market for electronic Assisted Living Technologies (eALTs) for the 50-70 year old age

Name of Source	Type of Resource	Level of Access	Brief Description
			group.
Fortune webpage (remote patient monitoring)	Web portal	Public	List of articles resulting from a search using "Remote Patient Monitoring"
Fortune webpage (wearable technology)	Web Portal	Public	List of articles resulting from a search using "Wearable Technology" including M&As, market data, etc.
HMI-basen	Web portal	Public	Information on nearly 60,000 devices (including discontinued products) and more than 1,000 suppliers of assistive devices.
International Longevity Centre Global Alliance	Web portal	Public	Access to data and reports on the following: Care Communities and Housing Dementia Economics of Ageing Equality and Human Rights Future of Ageing Global Ageing Health and Healthy Ageing Intergenerational Longevity Nutrition and Hydration Older Consumers Pensions Quality of Life Work and Retirement
Network for the market uptake of ICT for Ageing Well	Web portal	Public (full access for members only)	ICT for Ageing Knowledge Centre
Publications and Activities in the Area of: "Technology and Aging"	Bibliography	Public	List of publications and activities in the area of technology and aging
Research Repository UCD -- Browsing CLARITY Research Collection by Subject "Ambient assisted living"	Database	Public	Comprehensive research database of academic papers on the topic of AAL
Scandinavian Conference on Health Informatics 2013	Conference Proceedings	Public	Selection of papers presented at the 2013 Scandinavian Conference on Health Informatics
South East Health Technologies Alliance (SEHTA)	Web portal	Public	

5.7 Assessment of data availability and accessibility in the EU

A total of 143 documents and/or websites (not including the Comprehensive Sources listed above) related to Ambient Assisted Living were identified as relevant to Monitoring the AAL Market Evolution in the EU. In these documents there were 182 references to Monitoring the AAL Market Evolution in the EU in these documents, as shown in Table 10 below.

The AAL market is one of overlaps, interdependencies and inter-relationships; consequently the incidence of multiple reference points in a single document is not unexpected. The existence of this overlap adds little complexity to the research process, and in many cases having AAL data presented in an integrated way is a reflection of the ideal state of the technology and the market, presenting a rich view to the Market Observatory user. However, the overlap could also be a symptom of a low level of innovation which could lead to a lack of usable and affordable AAL systems coming to market.

Table 14 Documents containing data relevant to Monitoring the Evolution of the AAL Market in the EU

Monitoring area	Number of documents containing relevant data
Actual and potential demand	53
Market value and size	58
Market trends and drivers of evolution	59
Interoperability and standardization issues	21

Note: Documents were counted multiple times when there are references to more than one topic in a single document

5.7.1 Main Sources of Documents

As shown in the table below the documents containing data relevant to the Evolution of the AAL Marketing in the EU came from a wide variety of primary sources, different countries across the European Union as well as other geographies in the broader global market. Relevant data were presented in a diversity of formats, were relatively recent and very often available at no cost. The documents covered a wide range of topics related to AAL, but the breadth of perspective was significant.

Market research and consulting firms provide much of the data that would be of most interest to the users of the Market Observatory. These data are sometimes available at no cost, particularly at a high level however, detailed data may require some investment.

Table 15 Sources of Documents Pertaining to the Evolution of the AAL Market in the EU

Primary Source	Percentage
Government and NGO	18%
Market Research and Consulting Firms	33%
Academia	10%
EU Project	14%
Other (Association, Publisher, Corporation, Advocacy)	25%

5.7.2 Geographies Covered

The documents examined were sourced from a variety of geographies, although as Table 16 shows, just 20% of the documents (non-European national) contained little or no data specific to Europe. The data obtained from these sources is still considered to be relevant because of the global nature of the AAL market, particularly at this fragmented and nascent stage, it is important to understand what the rest of the world is doing, even if this is only for comparison purposes. The geographic source of the documents accessed is well balanced and quite evenly distributed across the categories and geographies.

Table 16 Availability of documents by Geography

Assessment Criteria	% of Documents Accessed in each Category			
Monitoring the AAL Market Evolution	Global	Pan-Europe	National (Europe)	National (non-Europe)
Actual and potential demand (53 documents)	10%	23%	44%	23%
Market value and size (58 documents)	24%	31%	29%	16%
Market trends and drivers of evolution (59 documents)	23%	30%	32%	16%
Interoperability and standardisation issues (21 documents)	33%	24%	33%	10%

Note: Documents were counted multiple times when there are references to more than one topic in a single document

5.7.3 Accessibility of Documents

A high volume of data is available at no cost. This is important for assessing the feasibility of the Market Observatory. As shown in Table 17, the majority of the sources evaluated during the desk research process provided full access and download to the data. However, it should be noted that market size and trends data is primarily available for purchase only – this is directly related to the source, which is most often a market research or consulting firm. It is not unusual for these data to be included in a presentation which may then provide free access, however detailed analysis is usually restricted to the more comprehensive reports which must be purchased.

Table 17 Availability of Documents

Monitoring area	% of Documents Accessed		
Monitoring the AAL Market Evolution	Public – free download	Public – abstract only	Availability by subscription or purchase only
Actual and potential demand	100%*		
Market value and size	77%	14%	9%
Market trends and drivers of evolution	84%	10%	6%
Interoperability and standardisation issues	81%	14%	5%

Note: *1 document was "view only"

5.8 Monitoring the Main Players in the EU

In terms of the identification and collection of data and information for the main players in AAL field need for a precise mapping of stakeholders was indicated as one of the most significant areas of investigation. Workshop participants stressed the importance of obtaining accurate data and information for at least four distinct stakeholders' categories:

- Businesses/Large Companies/SMEs, with particular attention to the latter type of businesses;

- Users;

- Researchers;

- Health and care providers;

- Business developers, facilitators, Venture Capitalists.

Regardless of whether it is a service business, manufacturer, retailer, or some other type of business, the business owner should know the industry well, particularly industry participants, competitors, and their distribution channels. No matter what the industry is, the internet has had an enormous impact on the availability of business information and there are websites for business analysis, financial statistics, demographics, trade associations, and just about everything an organization might need to develop a complete business plan.

However, in the case of AAL, there were few documents that provided comprehensive lists of main players in the market; a few lists identified players in a particular segment of the market were sourced, but an in-depth search for a more detailed, all-inclusive list was not very fruitful. Provision of a holistic view of the market that includes a more complete list of players would add significantly to the Market Observatory's credibility.

Maintaining a market watch is particularly important when it is a nascent or rapidly changing market such as Ambient Assisted Living with new entrants making an appearance on a very regular basis, often from surprising industry sectors. For example, in January 2014 Nintendo promised to wow customers with health-related innovations to turn around the business.[17]

It will be important for the Market Observatory to provide insights into data the covers the broader definition of AAL, including consumer devices from multiple sectors (e.g., healthcare, physical fitness, entertainment, security and safety, smartphones, mobility), clinical and medical devices (regulated and non-regulated), and pharmaceutical companies who will undoubtedly enter this market. This could present a challenge because of the sheer volume of relevant data required to support an appropriate level of depth as well as breadth.

During the desk research process, the broader interpretation of the AAL was considered and documents that spoke to innovative new entrants were included as relevant to the Observatory. Of the total number of 117 documents accessed, thirty-two documents and/or websites related to Ambient Assisted Living were identified as relevant to Monitoring the Main Players in the EU.

5.8.1   Main Sources of Documents

The documents containing data relevant to Monitoring the Main Players in the EU came from a variety of sources, however the majority were produced by market research or consulting firms. Other organizations, including some

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[17] http://www.theguardian.com/technology/2014/mar/04/nintendo-games-wiifit-health-strategy

from which documents were sourced and included in the list of relevant documents for the Observatory, contained data about main players in AAL that originated with market research firms.

Market research data is credited with removing some of the risks inherent in management decision making; it does not guarantee success, however good market research should specify the risks, suggest alternative courses of action and the probability of success of these alternatives, wherever this is possible. Market research firms are also the source of much of the forward looking, or forecast data about a market including new entrants. All of this is critical to the stakeholders in a market that is as complex as AAL.

The incidence of EU Projects included in this list is low because there was a deliberate attempt to look for alternative sources, given that the Commission is already aware and has access to all internally funded project documentation. These would of course be ideally suited for inclusion in the Market Observatory as part of the overall collection.

Table 18 Sources of Documents pertaining to the Monitoring the Main Players in the EU

Primary Source	Number of Documents	Percentage of Documents Accessed (117)
Government and NGO	4	3%
Market Research and Consulting Firms	15	13%
Academia	1	1%
EU Projects	4	3%
Other (Association, Publisher, Corporation, Advocacy)	8	7%

5.8.2   Geographies Covered

The documents examined were sourced from a variety of geographies, which is not surprising given the global nature of the technology market today. Of the 32 documents considered relevant to Monitoring the Main Players, 10 provided Pan-European data, 10 provided national data for various European countries, 7 were global in coverage and 5 provided national data from the US.

Table 19 Availability of documents pertaining to the Monitoring the Main Players in the EU by Geography

Monitoring area	% of Documents Accessed in each Category			
	Global	Pan-Europe	National (Europe)	National (non-Europe)
Monitoring the AAL Players	6%	9%	9%	4%

5.8.3   Accessibility of Documents

The majority (24 in total) of the documents related to Monitoring the Main Players were available in the public domain at no cost. The same comments apply to the data in these documents as it does to the documents related to the Evolution of the AAL Market in the EU – much of the free data is high level, although still relevant and useful as a baseline. There is a cost associated with obtaining more specific data and deeper analysis of the market players. It is not the Market Observatory's role to provide all of the data required by the stakeholders, and in many cases the high level data will suffice.

Table 20 Accessibility of documents on Main Players

Monitoring Area	% of Documents Accessed		
	Public – free download	Public – abstract only	Availability by subscription or purchase only
Monitoring the AAL Main Players	21%	4%	4%

5.9 Conclusions

Monitoring the AAL market was considered highly important by stakeholders who participated in the Workshop, as it contributes to answering the following questions:

- Which solutions[18] are out there and what kind of solutions are needed?

- Do the existing solutions meet the demand expectation? Do the existing solutions are adopted by the demand?

- Who is my customer? Who could be my customer?

- Why would people buy my solutions?

It was agreed that information about solutions is highly important to avoid the 'reinventing-the-wheel' effect. Information about solutions in all stages of development as well as solutions already in the market would be of interest of stakeholders. Different stages are relevant to different groups of stakeholders. Furthermore, information on consumer trends and end-users would help better understanding this umbrella-market and help a better match between supply and demand sides.

5.9.1 Assessment of data availability and relevance

As the Figure below shows, at a high level there appears to be a high volume of relevant data for the initial population of an AAL Market Observatory. The red blocks identify areas where there is a low level of relevant data. For example, there is a paucity of data that address the number of actual users *and* providers of AAL technology. This is not surprising given the fragmented state of the market – it includes a wide range of consumer products, many medical devices (some of which are regulated, some not), as well as many component parts of other systems that may or may not be defined as AAL – home safety systems for example.

However, the problem is the lack of data comparable across the 28EU and with a high frequency of updating, able to feed periodical reporting of the Observatory.

Although several documents were sourced that referenced partial classification of AAL technologies and devices, the situation will remain a challenge until a more definitive AAL device classification system is developed and adopted. In the meantime, the Commission could assume a leadership role and adopt a classification system recommended by one of the many AAL studies; otherwise it will continue to be difficult to speak to the AAL market in a cohesive and consistent way.

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[18] In this context '**solutions**' is use as an umbrella term for any kind of product or service.

Figure 6 Assessment of data availability and relevance

Figure 6 Assessment of data availability and relevance
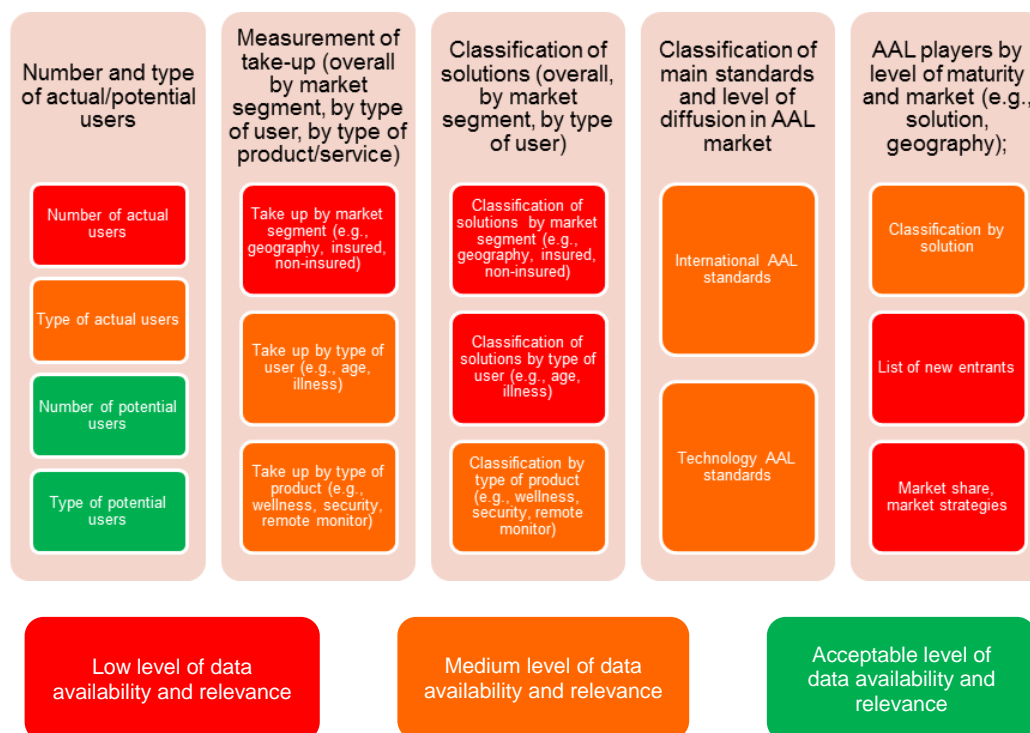
On the other hand, there is a significant amount of data about *potential* users, mainly based on demographics. This is a good start to defining the market potential, however further segmentation is needed in order to be specific about market development recommendations. Aging is an indicator of future growth for the AAL market, but the incidence of conditions that could benefit from AAL is not confined to the elderly, so more data related specifically to AAL potential would be beneficial.

Data about standards is available, but fragmented, a situation that reflects the state of the AAL industry. This will change as the market changes and as there is more attention paid to implementing standards across the many AAL products.

5.9.2 Assessment of data validity and reliability

To assess the validity of the data for Monitoring the Evolution of the AAL Market in the EU and Monitoring the Main Players, we determined whether the data responded to the following criteria, which are inspired by the criteria for the quality of indicators known as RACER in the Commission's Impact Assessment Methodology:

- **Relevant**. Closely linked to what we are measuring;

- **Accepted**. Reflects the stakeholder needs;

- **Credible**. Unambiguous and easy to interpret;

- **Easy to monitor**. Low cost data collection;

- **Robust against manipulation**. Withstands sensitivity analysis.

To assess reliability, the following criteria were applied:

- **Scientific quality**. Metrics, calculation methods, and presentation of results at a high scientific quality;

- **Internal consistency**. Coherent, consistent data;

- **Full transparency**. Data collection and calculation methods that are clear and fully documented.

As Figure 6 below shows, while the volume of available data at relatively low cost is high, the completeness, comparability and quality of the data leave much to be desired. The challenge is not with the individual documents, which were determined to have a high quality of validity and reliability, but overall the *collections* of data are inconsistent, which makes comparison across various documents and projects very difficult. Moreover, there is insufficient comparable data for the 28EU at country level. This situation could make it difficult for users to capitalize on the full value of the Market Observatory. At the time of search, this will be overcome to a certain extent by the quality of the search engine, which will find the relevant documents despite the lack of consistency; however in real terms the need to compare will still exist.

Figure 7 Assessment of data validity and reliability
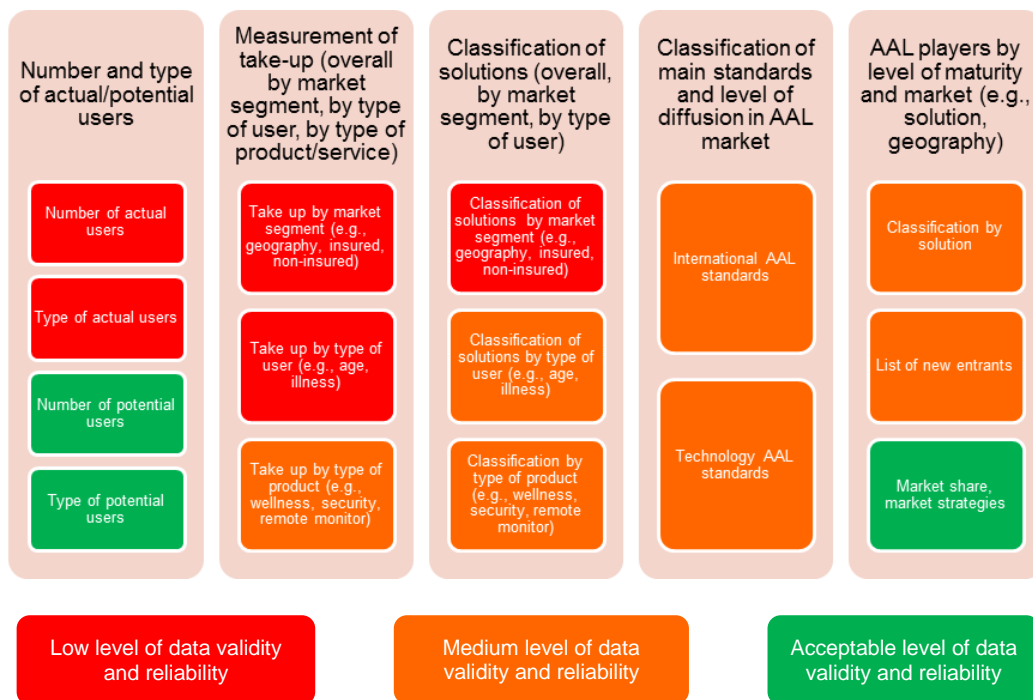
The challenge for the Market Observatory will be in trying to maintain the Market Observatory in a current state, because sourcing these documents and websites in an efficient and effective way could be difficult since they are not organized in a way that provides for highly structured or automated capture. Consequently, the data capture process is labour intensive.

5.9.3 Assessment of data gaps and quality

The needs of the stakeholders are the primary concern when assessing whether there are gaps in the data that is available and whether the quality of the data is sufficient to ensure that it provides value. Given this scenario, there is a need to cover both the supply and demand sides and therefore, the Market Observatory must address the following questions:

- What AAL products, services and solutions are needed?

- Who needs AAL products, services and solutions?

- How are customer segments defined?

- What AAL products and solutions are available?

- How are AAL product, services and solutions defined?

- Do currently available AAL products, services and solutions satisfy the demand?

- What is the rate of adoption of currently available AAL products, services, and solutions?

- Who paid (or is paying) for the AAL products, services, and solutions that are in use?

- What AAL product, services, and solutions are in development?

- What AAL product, services, and solutions are in the research stage?

These questions were uppermost when the desk research for this feasibility study was designed. Table 21 below depicts the ability of the data sourced during the project to provide answers to stakeholders' questions and forms the basis for the gap analysis and associated recommendations for action.

Table 21 Gap analysis: Overall ability of the data to answer stakeholders' primary questions

Question	Required Data	Data Availability and Relevance	Data Validity and Reliability	Suggested Actions to fill the gap
Who needs AAL products, services and solutions?	Segmented demographic data (by age, health, residence)	High level of availability of relevant data – may not have a high enough level of segmentation to suit a stakeholder's needs	High level of validity and reliability	No action required – it is not the role of the Observatory to provide highly segmented demographic data, i.e., beyond age, health, residence.
What AAL products, services and solutions are needed?	Demographic data segmented by specific medical condition Projections re growth in incidence of specific medical conditions	Medium level of availability of relevant data – cohorts of people with similar medical conditions can satisfy this need in some cases	Medium level of validity and reliability – this data is often developed by not for profits, it may not be maintained in a current state	Form a partnership with patient advocacy groups, e.g., International Diabetes Federation, Alzheimer Europe, European Stroke Organisation with the goal of obtaining up to date statistics on the incidence of diseases for which AAL products, services and solutions are needed
How are AAL products, services and solutions defined?	Definition of the AAL market (map of the AAL ecosystem) Classification of AAL products, services and solutions	Low level of availability of relevant (i.e., complete) data	Low level of validity and reliability – in many cases the data is incomplete, i.e., representing a small portion of the overall market	Develop a map of the AAL ecosystem and a list of products classified according to category and based on the conclusions and recommendations of the many EC funded projects that have presented full or partial ecosystems – this can be used as the foundation for the Observatory's structure
What AAL products, services and solutions are available?	List of AAL products, services and solutions already on the market	Low level of availability of relevant (i.e., complete) data	Low level of validity and reliability – in many cases the data is incomplete, i.e., representing a small portion of the overall market	Based on the classification system, develop a list of product, service, and solution providers and their products –this can be based on existing sources, and as suppliers provide information the list needs to be updated
What is the rate of adoption of currently available AAL products, services, and solutions?	Market data re adoption rates for AAL products, services and solutions	Medium level of high level relevant data is available at no cost; high level of detailed data is available for purchase	High level of validity and reliability	Form a partnership with one or more market research firms to provide access to specific data sets needed to support AAL stakeholders – the Commission's leadership in developing a cohesive and consolidated source of this key data would justify the existence of the Observatory

Question	Required Data	Data Availability and Relevance	Data Validity and Reliability	Suggested Actions to fill the gap
What AAL product, services, and solutions are in development?	Data re AAL projects in development with regular updates	Low level of consolidated data re AAL projects in development – academic reports, EC funded projetu hai ct reports are often "one-off" reflecting the project at a single stage	Low level of consolidated valid and reliable data on AAL projects that are in development	The deliverables of research projects are already public. Based on the classification system, develop a list of products, services, and solutions that are in development.
What AAL product, services, and solutions are in the research stage?	Data re AAL research projects with regular updates	Low level of consolidated data re AAL research projects – academic reports, EC funded project reports are often "one-off" reflecting the project at a single stage	Low level of consolidated valid and reliable data on AAL research projects	The deliverables of research projects are already public. Providing mapping of contents according to common criteria would be helpful.

6 Monitoring Investment-related developments

6.1 Overview

The AAL field consists of multiple players across a broad range of technology domains such as remote patient monitoring, remote device diagnostics, mobile health apps, home automation, connected devices, physical security systems, smart public transport, intelligent emergency services and various others. In addition to large, established ICT vendors, most of the market participants are smaller, privately held start-up companies. In order to keep track of players in this space, the Observatory could use different sources that provide data about technology companies, their activities and investment-related developments.

In recent years, AAL-related fields have become key areas of investment for venture capital (VC) and private equity (PE) firms, angel investors, business accelerators, business incubators and others. These investors provide financial support to start-up companies in order to earn a return on their investment through "exits" or "liquidation events", namely mergers and acquisitions (M&A) and initial public offerings (IPO).

Investments in AAL-related companies are also being made by technology vendors that look to establish their presence in this market and gain visibility into emerging technologies developed by related niche players. Technology vendors are also highly prominent in M&A activities. As in other domains, acquisitions of specialized AAL players by technology vendors are driven by motivations such as gaining unique technological capabilities, achieving a competitive edge, increasing market share, shortening time to market, and others.

Given the above, in order to gain insight into the entire ecosystem of AAL companies and AAL market trends, the Observatory would have to continuously monitor the entire scope of investment-related developments, including funding deals, M&A transactions and IPOs.

6.1.1 Main monitoring areas

The table below presents the main monitoring areas that are suggested for the Observatory in order to provide a consistent monitoring and measurement of investment-related developments in the AAL field.

Table 22 Description of Monitoring Areas

	Monitoring Investment-Related Developments	Description	Examples
1	Data on number, type and size of funding initiatives: Venture Capital financing, Seed Funding, IPOs in AAL field	News and data on funding initiatives including private funding rounds and IPOs of tech companies	CrunchBase, VentureBeat, VentureDeal, Freshnews, CB Insights, VC Experts, ArcticStartup, myFrenchStartup, IVC-Online, StartUp Health Insights
2	Data on number, type and size of investment facilitators: Business Angels, Accelerators, Incubators in AAL field	Investor databases and news on fundraising by venture capital firms, private equity firms and others	CrunchBase, VentureBeat, VentureDeal, CB Insights, VC Experts, StartUp Health Insights
3	Data on number, type and size of other market oriented initiatives: M&A in AAL field	News and data on M&A deals involving tech companies	CrunchBase, VentureBeat, VentureDeal, Mandasoft, Telecompaper, Freshnews, CB Insights, VC Experts
4	Data on number, type and size of organizations receiving financing: Start Ups in the AAL field	News and data on start-up companies	CrunchBase, VentureSource , VentureDeal, CB Insights, VC Experts, VentureSource, ArcticStartup, myFrenchStartup, IVC-Online, Medtech Company Startups Database, StartUp Health Insights

- **Funding initiatives:** Funding initiatives are aimed at providing technology companies with external investment for their activities, including R&D, sales and marketing, geographic expansion and others, across the entire company lifecycle, from seed and early stage to later stage. By keeping track of investments in AAL-related fields, the Observatory should be able to provide continuous assessment of the development of the market, identify new technologies and the companies that bring them to the market. The data should include ongoing updates on AAL-related funding initiatives as well as in a given period (i.e. per month/quarter/year), and statistics such as total funding and breakdown of deals by company lifecycle stage, technology market and market segment, location, sources of funding (i.e. VCs and PE firms), location and others. It should also be possible to provide data on IPOs, including company description, IPO size, and company revenue (where available), technology market and market segment.

- **Investment facilitators:** There are multiple sources of funding available for technology companies, including VCs, PE firms, angel investors, business incubators, business accelerators and the public (in the case of IPO events), among others. Looking into the activities of investment facilitators should enable the Observatory to assess the availability of financial sources to support the development of entrepreneurial companies in the AAL field. The Observatory should include constantly updated lists of entities that are actively involved in AAL investments, including statistics on amount of funds under their management, AAL-related portfolio companies, and others. It should also be useful to provide ongoing updates on fundraising by investment facilitators, as these funds can potentially be used for investments in relevant companies.

- **M&A deals:** The ICT industry is highly dynamic in terms of M&A activities. Monitoring these activities would provide the Observatory with data on key issues such as market maturity and the entrance of established players into the market, which may have a significant impact on the availability of AAL solutions for target audiences. Data on M&A deals would include ongoing updates on AAL-related transaction as well as in a given period (i.e. per month/quarter/year), and statistics such as total AAL-related M&A spending and breakdown of

M&A deals by technology market and market segment, location (both for the acquirer and target company), types of deal (i.e. merger/management buyout/asset acquisition and so forth), and others.

- **Start-ups:** By continuously tracking start-up companies in the AAL field and gaining insight into market participants, emergence of new players and other related matters, it should be possible to assess the evolution of the global market, as well as in the EU and in specific countries. The Observatory should include constantly updated lists of AAL-related start-ups, including statistics such as breakdown of companies by location, market and market segment, etc.

6.2 Identification of main sources

Data about funding initiatives, investment facilitators, M&A deals and start-up companies is widely available through news websites and blogs that provide dedicated coverage of these activities, and specialized (usually subscription-based) online databases. These sources typically provide different levels of granularity in their coverage. Therefore, by obtaining data from multiple sources it should be possible to improve our ability to expand the scope of the collected data. In addition, most of the proposed sources cover the start-up scene at the global level and are not focused on specific regions and countries. Therefore, it should be necessary to use additional sources that are dedicated to the coverage of EU countries.

Generally speaking, most of the proposed sources provide regularly updated data about investment-related developments in the general ICT sector rather than specific data about the AAL field. In order to search the proposed sources for AAL-specific data, it is necessary to use specific knowledge and expertise such as that owned by IDC in monitoring the global ecosystem of start-up companies, investment and M&A trends. For example, it is possible to search through the news websites, using common search mechanisms (using relevant keywords, for example). Specialized online databases support a more granular search of investment-related developments that match the scope of the Observatory as they may support the option of search by technology market. It should be noted that many of the proposed sources (both news websites and online databases) provide data that is relevant to several of the indicators suggested by this study and in some cases all indicators.

The tables in Annex present the sources that could be used by the Observatory to track investment-related developments in the AAL field focused on the main monitoring areas.

6.3 Assessment of data availability

Based on IDC's vast experience in tracking M&A and investment deals involving technology start-ups, and working with most of the abovementioned sources on an ongoing basis, we are positive in our assessment of the availability of data on investment-related developments in the AAL field. As depicted above, constantly updated data about financial and business development activities in the global start-up ecosystem is widely available from a variety of sources. Given that, we assess IDC's ability to provide regularly updated quail-quantitative data on a high level.

We assess the availability of quali-quantitative data by market segment and across Europe on a medium level. Although we believe that the vast majority of investment-related developments can be tracked using the proposed sources, we assume that gaps may exist in the tracking of deals in specific countries, as well as in the tracking of deals that we may fail to identify as related to specific AAL market segments (due to lack of sufficient data). Based on IDC's experience and after reviewing multiple sources, breakdown of investment-related activities by end-user group (e.g. age groups) is not available. Still, the Observatory should be able to provide a less granular segmentation of companies and activities by primary audience – i.e. consumers/businesses. In some cases, we will be able to provide more data about specific target audiences – i.e. small/medium/large businesses.

Monitoring Investment-Related Developments	Availability of quantitative data			
	Across Europe	By market segment	By end-user market	Regularly updated
Data on number, type and size of funding initiatives: Venture Capital financing, Seed Funding, IPOs in AAL field	🟧	🟧	🟥	🟩
Data on number, type and size of investment facilitators: Business Angels, Accelerators, Incubators in AAL field	🟧	🟧	🟥	🟩
Data on number, type and size of other market oriented initiatives: M&A in AAL field	🟧	🟧	🟥	🟩
Data on number, type and size of organizations receiving financing: Start Ups in the AAL field	🟧	🟧	🟥	🟩

6.3.1 Assessment of data gaps and quality

For the most part, the abovementioned potential data gaps may stem from the nature of specialized online databases, which the Observatory will use as primary sources. These databases provide high quality data about start-up companies, investments, M&A deals and IPOs, across a broad range of technology domains, including all the markets defined as AAL-related, and across the entire globe. However, they may fail to track specific "low profile" companies, mostly smaller companies that are focused on domestic niches market rather than international markets, companies that have not raised any external funding, etc.

Part of this gap can be filled-in using news websites, and especially country-specific ones. To improve our ability to provide a complete coverage of AAL-related investment developments, we could employ teams of local analysts in specific countries, and especially in non-English speaking EU countries. These teams will review country-specific news websites on an ongoing basis. Still, the data that can be obtained using these sources might be partial, for example if it is only given in the context of a press release. In these cases, the quality of data will likely be lower and may not allow the in-depth understanding of a company's business as provided by professional online start-up databases.

6.3.2 Conclusions on feasibility

We believe that based on the proposed methodology we should be able to address the research requirements for continuous coverage of investment-related developments in the AAL field on a global basis and in the EU. Data gaps, should they exist, would likely revolve around more esoteric companies and developments, which accordingly will have limited impact on our ability to meet the objectives of the research. However it is clear that this activity will be costly and is not simply based on aggregating existing sources.

7 Monitoring the US/Canada markets

7.1 Overview

The Canadian and US healthcare markets are different from each other, both from a funding and delivery perspective. However, both countries have an aging population and an increase in the incidence of chronic disease and multiple morbidities that are driving up the cost of care. There is keen interest in both Canada and the US in developing delivery models that increase self-care and also allow people to continue to live at home for as long as possible. In tandem with exploring independent aging, the US is also investing significant effort in testing the assisted living model, which is somewhat different from aging in place. At this point in time, no definite path has been established, all options are still being considered.

Canada has shown more interest in AAL than in Assisted Living facilities and has been accepted as a participating country in the new-born AAL Programme. The AAL Programme, in its second phase, will run until 2020 with an estimated budget of € 700 million to invest in ICT for active and healthy ageing. Despite the non-eligibility of this North American country for the EU funding, Canadian companies and organizations will be able to join European consortium and therefore to contribute to the improvement of know-how, quality and commercial opportunities of the AAL projects. Canadians may be joining the projects starting form the next call in 2015.[19]

Using the same desk research process described earlier in this report and used to evaluate documents for the EU market, a total of 50 documents related to AAL in the US and Canada markets were sourced and evaluated for relevance to the AAL Market Observatory.

7.2 Actual and Potential Demand Documents

Twenty-five documents and/or websites related to "Actual and Potential Demand" in the US/Canada markets were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources and covered a wide range of topics related to AAL. Relevant data was presented in a variety of formats and was frequently embedded in a document that covered the topic of AAL as part of a report on the broader assisted living space. The data was relatively recent and very often was available at no cost.

7.2.1 Sources of Actual and Potential Demand Documents

As the following table indicates, data about the actual and potential demand for AAL solutions is primarily sourced from Government and Near Government Organizations. Given that demand for AAL products and services is closely driven by the aging society, demographic data is of critical importance. Official statistics are considered by many to be the best source for this type of data; it is not surprising therefore that the primary providers are government and near government organizations. Few Actual and Potential Demand documents were sourced from academia.

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[19] http://www.aal-europe.eu/canada-to-join-the-aal-programme/

Table 24 Main Sources of Actual and Potential Demand Documents

Primary Source of the Document	Percentage of Actual and Potential Demand Documents
Government and NGO	20%
Market Research and Consulting Firms	12%
Academia	4%
Other (Association, Publisher, Corporation, Advocacy)	14%

7.2.2 Market Value and Size Documents

Through desk research we located sixteen documents and/or websites related to "Market Value and Size" in the US/Canada markets that were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, covered a wide range of topics related to AAL

7.2.3 Sources of Market Value and Size Documents

Like the European market, as shown below, data regarding the AAL market value and size is primarily sourced from consulting and market research companies.

Table 25 Main Sources of Market Value and Size Documents

Primary Source of the Document	Percentage of Market Value and Size Documents
Government and NGO	6%
Market Research and Consulting Firms	63%
Academia	0%
Other (Association, Publisher, Corporation, Advocacy)	31%

7.2.4 Market Trends and Drivers of Evolution Documents

Fifteen documents and/or websites related to "Market Trends and Drivers of Evolution" in the Canada and US markets were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources and covered a wide range of topics related to AAL.

The drivers of the AAL market are somewhat different in Canada and the US – in Canada the aging population is certainly a factor but the large number of Canadians living in remote or rural communities with minimal access to a physician and Canada's commitment to universality in provision of healthcare services, dictates that alternative methods of service delivery are essential.

7.2.5 Sources of Market Trends and Drivers of Evolution Documents

As shown in Table 26, data regarding the AAL market trends and drivers of evolution in the Canada and US markets are sourced almost equally from market research companies and government. Along with the market size and value data discussed above, market trends and drivers are presented in detail by the market research firms, with defensible data driven rationale for their projections. Government and NGO organizations also produce a relatively high volume

of data on AAL market trends and drivers of evolution – this is not surprising given the potential impact AAL could have on healthcare delivery and its cost.

Table 26 Sources of Market Trends and Drivers of Evolution Documents

Primary Source of the Document	Percentage of Market Trends and Drivers Documents
Government and NGO	40%
Market Research and Consulting Firms	47%
Academia	0%
Other (Association, Publisher, Corporation, Advocacy)	13%

7.2.6 Interoperability and Standards Issues Documents

Five documents and/or websites related to "Interoperability and Standards Issues" in the Canadian and US AAL markets were identified as potentially relevant for inclusion in the AAL Market Observatory. The documents came from a wide variety of primary sources, and were related to countries across the European Union as well as other geographies in the broader global market.

7.2.7 Sources of Interoperability and Standards Documents

Although few documents were sourced pertaining to interoperability and standards for the Canada and US markets, as shown in Table 27 below they were sourced primarily from government.

Table 27 Sources of Interoperability and Standards Documents

Primary Source	Percentage of Interoperability and Standards Documents
Government and NGO	40%
Market Research and Consulting Firms	20%
Academia	0%
Other (Associations, Publishing, Corporations)	40%

7.3 Conclusions

7.3.1 Summary of availability and main sources

A total of 50 documents and/or websites related to Ambient Assisted Living were identified as relevant to Monitoring the AAL Market Evolution in the EU. In these documents there were 61 references to Monitoring the AAL Market Evolution in the EU in these documents, as shown in the table below.

Table 28 Documents containing data relevant to Monitoring the Evolution of the AAL Market in the EU

Monitoring Area	Number of documents containing relevant data
Actual and potential demand	25
Market value and size	16

Monitoring Area	Number of documents containing relevant data
Market trends and drivers of evolution	15
Interoperability and standardization issues	5
Total	50

Note: Documents were counted multiple times when there are multiple references in a single document; the total of 50 refers to the number of documents actually sourced with data relevant to Monitoring the Evolution of the AAL Market in the EU (not including Monitoring the Main Players or Investment Opportunities)

As shown in the table below, the documents containing data relevant to the Evolution of the AAL Marketing in Canada and the US came from a wide variety of primary sources. Relevant data were presented in a diversity of formats, were relatively recent and very often available at no cost.

Table 29 Sources of Documents Pertaining to the Evolution of the AAL Market in the US-Canada

Primary Source	Number of Documents	Percentage of Documents Accessed (50)
Government and NGO	13	26%
Market Research and Consulting Firms	15	30%
Academia	2	4%
Research Institutes	7	14%
Publishers, Journals	5	10%
Other (Associations, Corporation, Advocacy)	8	16%

7.3.2 Assessment of Accessibility

A high volume of data is available at no cost. As shown in the table below, the majority of the sources pertaining to the Canada and US markets evaluated during the desk research process provided full access and download to the data.

Table 30 Accessibility of Documents Pertaining to the Evolution of the AAL Market in the US-Canada

Monitoring area	% of Documents Accessed		
Monitoring the AAL Market Evolution	Public – free download	Public – abstract only	Availability by subscription or purchase only
Actual and potential demand	100%	0	0
Market value and size	69%	31%	0
Market trends and drivers of evolution	87%	13%	0
Interoperability and standardisation issues	81%	14%	0
Total	80%	20%	0

7.3.3 Assessment of data gaps and quality

The assessment of data availability and relevance for the US and Canada is similar to that carried out for Europe by type of data. There is in fact greater availability of data, but with the same characteristics of unevenness, difficult comparability and difficult aggregation.

Concerning data validity and reliability, the pattern is very similar with some higher level quality data. Overall, the suggested measures to fill in the gaps are not different from those indicated for Europe.

Figure 8 Assessment of data availability and relevance in the US and Canada
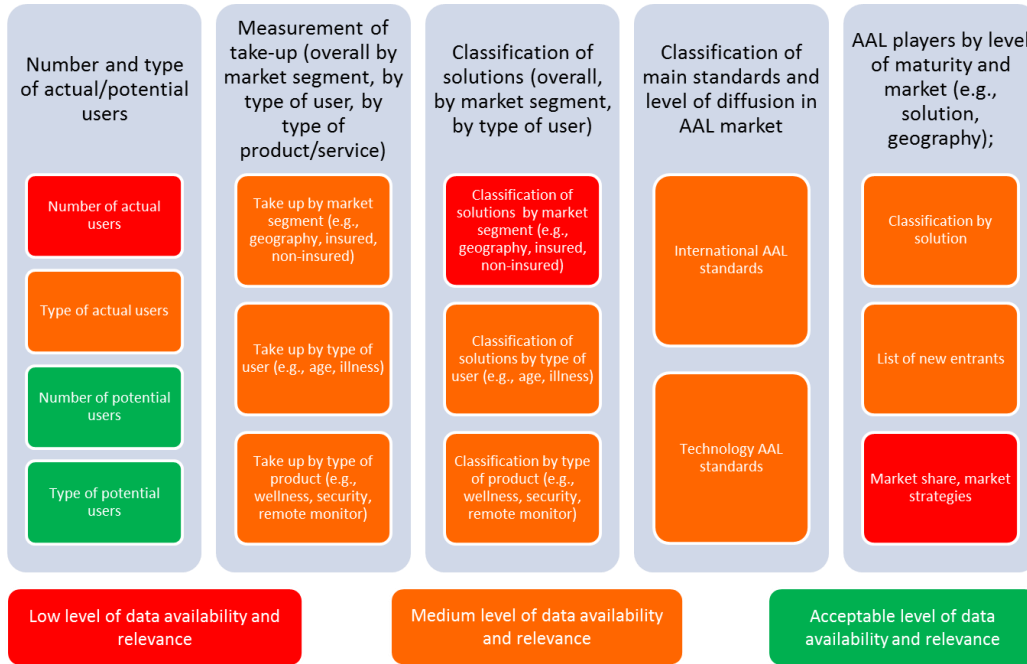
Figure 9 Assessment of data validity and reliability in the US and Canada
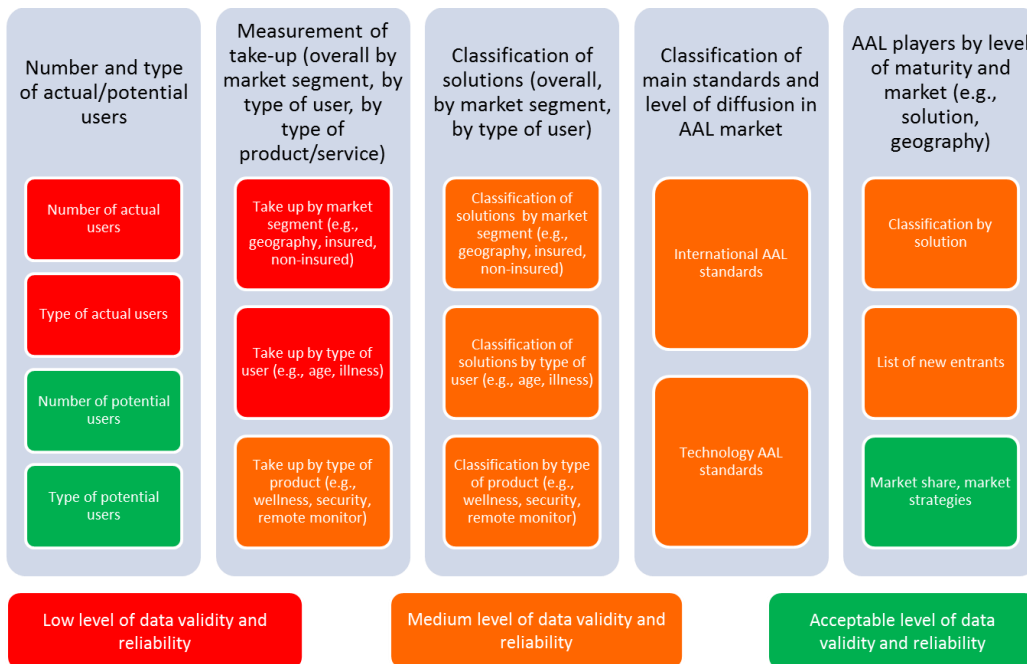
8 Monitoring the Asia-Pacific markets

8.1 Overview

The section reports the results of the desk-research of documents and sources related to AAL in the Asia-Pacific markets, potentially relevant for the Market Observatory.

8.2 Actual and Potential Demand Documents

The study team identified 14 documents of different types (websites, presentations, reports, articles) that report information and data on the "actual and potential demand" for the AAL market in Asia-Pacific; and that can be considered interesting and relevant sources for the Market Observatory.

These documents have been produced by different sources, including:

- Government agencies acting both at national and international level;

- Consulting and market research companies;

- Media companies;

- Academia.

A large part of the information is publicly available on the web and for free; while other documents are pay-as-you-go products, especially because they are produced by market research and commercial companies that indeed publish press releases, abstracts and Power Point presentations for free.

As shown in the table below, in general the identified documents are quite recent as they cover the period from 2010 to 2014, so they can provide a good and up-to-date overview and understanding of the current status of these markets.

Most of the documents we found are about the Chinese and the Japanese countries while other focus on the Asian region as a whole, often including countries profiles reporting on the local peculiarities.

From the point of view of the content of the data, the key findings can be summarized as follows:

- There is a high availability of demographic data and this is mainly due to the research and surveys carried out by the Statistical Offices on behalf of the national governments and international organization (e.g. U.N. Agencies).

- There are cases of non-Asian governments, like Australia and Canada governments that produce reports and dissemination materials highlighting the potential business opportunities in the field of the ICT for ageing and AAL in Asia- Pacific in order to encourage the local companies to address these markets.

- In general we found a number of sources reporting about the actual and potential demand of ICT products and services for ageing population in these countries; however these seem to be mainly ad-hoc and non-periodic documents.

8.3 Market Value and Size Documents

Out of 20 collected, data and information related to the market size and value relevant for the AAL and ICT for active ageing can be found in 8 documents.

Most of these documents are fully available on the web and have been produced by different primary sources (government, academia stakeholders, and market research companies); the articles reported in the table below are publicly available on the media websites but in some cases they are secondary sources reporting data from private commercial primary sources.

As already mentioned in the previous paragraphs, the data available through these documents are not produced on a periodic timing and cannot be compared due to the lack of statistical criteria.

8.4 Market Trends and Drivers of Evolution Document

11 documents report data and information on the Market Trends and Drivers of Evolution in the Asia-Pacific and except for one, all are fully available for free; 6 documents specifically address the China and Japan markets (3 each) while 5 of these focus on Asia as a whole and they sometimes provide brief country insights.

Most of the documents highlight the numerous emerging opportunities for the companies in the field of ICT and ageing technologies to address this market and the growing demand in these countries. The main factors driving the market opportunities are the high percentage of old population in these countries, and their dynamic living conditions from the socio-economic point of view.

8.4.1 Accessibility of Documents

The large majority of the collected documents is available on a free basis and is fully accessible on the web. Concerning the online articles however, sometimes they are secondary sources that report primary data from private and commercial organizations.

8.4.2 Assessment of data gaps and quality

Following the same approach as in paragraph 5.9 the assessment of data gaps and quality is based on their ability to respond to the following questions:

- What AAL products, services and solutions are needed?
- Who needs AAL products, services and solutions?
- How are customer segments defined?
- What AAL products and solutions are available?
- How are AAL product, services and solutions defined?
- Do currently available AAL products, services and solutions satisfy the demand?
- What is the rate of adoption of currently available AAL products, services, and solutions?
- Who paid (or is paying) for the AAL products, services, and solutions that are in use?
- What AAL product, services, and solutions are in development?
- What AAL product, services, and solutions are in the research stage?

Concerning the Asia-Pacific market for AAL solutions, the study team has been able to develop the following assessment on the basis of the results of the desk research.

As the table below shows, most of the data that are considered relevant for the purpose of the Market Observatory to monitor the Asian AAL market are not available at the moment.

Specifically, the single documents published by the different primary sources and collected through the desk research do not provide a satisfactory picture of the Asian market as they are very fragmented and do not allow carrying out comparisons. The inconsistency affecting the data on this market and the lack of systematic data collections are the main gaps to the data availability and quality.

Table 31 Gap analysis: overall capability of data to respond to stakeholders' primary questions

Question	Required Data	Data Availability and Relevance	Data Validity and Reliability
Who needs AAL products, services and solutions?	Segmented demographic data (by age, health, residence)	Medium level of availability of relevant data	High level of validity and reliability - this data is often developed by national statistical offices and international organizations
What AAL products, services and solutions are needed?	Demographic data segmented by specific medical condition	Low level of availability of relevant (i.e., complete) data	Medium level of validity and reliability – this data is often developed by not for profits, it may not be maintained in a current state
	Projections re growth in incidence of specific medical conditions		
How are AAL products, services and solutions defined?	Definition of the AAL market (map of the AAL ecosystem)	Low level of availability of relevant (i.e., complete) data, lack of standard definitions of the AAL market	Low level of validity and reliability – lack of comparability and classification criteria, in many cases the data is incomplete, i.e., representing a small portion of the overall market
	Classification of AAL products, services and solutions		
What AAL products, services and solutions are available?	List of AAL products, services and solutions already on the market	Low level of availability of relevant (i.e., complete) data	Low level of validity and reliability – in many cases the data is incomplete, i.e., representing a small portion of the overall market
What is the rate of adoption of currently available AAL products, services, and solutions?	Market data re adoption rates for AAL products, services and solutions	Detailed data is available for purchase	High level of validity and reliability
What AAL product, services, and solutions are in development?	Data re AAL projects in development with regular updates	Low level of consolidated data re AAL projects in development – data only from academic reports	Low level of consolidated valid and reliable data on AAL projects that are in development
What AAL product, services, and solutions are in the research stage?	Data re AAL research projects with regular updates	Low level of consolidated data re AAL research projects	Low level of consolidated valid and reliable data on AAL research projects

8.5 Conclusions

In this section we have presented the results of the desk-research of documents and sources related to AAL in the Asia-Pacific markets that are potentially relevant for the Market Observatory, as well as the assessment of the data availability and quality and the resulting data gaps.

Most of the available sources focus on the Asian region as a whole, while looking at the countries the majority of information available concern China, Japan and Malaysia.

The research brought to the identification of 20 relevant documents related to the AAL area in Asia. The minor number of documents found about these markets compared to the analysis carried out for Europe is mainly due to language barriers since a high number of website are mainly in local languages and the English section has limited information. The documents analyzed for this section are all in English.

Generally speaking, in most cases both quantitative and qualitative data are available in these documents: from statistical data and market estimates to qualitative variables.

Most of the documents collected are relevant for more than one "core monitoring data" area identified by the study team (demand, market, players, and investments) so they are often repeated in the different sections below.

These documents do not provide comparable data and information as they are mainly ad-hoc and one-off reports, presentations, etc., that are hardly repeated on a periodical basis and using a statistical and comparable sample.

The main barriers to the data availability for the Asia-Pacific AAL markets are mainly the fragmentation of the documents and sources producing the data, and the lack of systematic data collections in the AAL field except for the purpose of collecting demographic data.

9 Overview of comparable initiatives

This chapter presents the process and the results of the research carried out by the study team to identify and analyze existing websites and portals in the specific domain and outside the ambient assisted living field that might inspire the design and implementation of the AAL Market Observatory.

Since one of the goals of this study is to investigate about the most adequate business model of the future AAL Market Observatory that will ensure its sustainability, the study team focused on those websites' business models, as a combination of information about their sources of founding, payment models, and the way their users can access to the information.

The process that led the study team to the identification of 16 relevant websites (9 within the AAL field and 8 focused on other domains) is described in the following paragraphs.

9.1 Identification and classification

The adopted approach was performed through desk research and analysis of the available documents since the end of April 2014.

Specifically, in order to collect information on the existing initiatives similar to the future Market Observatory the study team carried out:

- A literature review of the main documents available on the AAL Association's website and on the main public sources;

- A systematic desk research of the relevant websites, national and institutional websites in and outside the field of the Ambient Assisted Living.

 As a first step of this activity, the study team prepared a structured template of database for the data collection and analysis of the results. The websites listed in the database were analyzed taking into account the following information:

- Website name;

- Website URL;

- Type of online/offline entity (network, community, platform, EU project, observatory, cluster, etc);

- Sector/industry (within or outside the AAL field);

- Size of the online community;

- Type of ownership of the website (publicly/government owned, private, association/cooperation of non-profit organizations, other);

- Leading partner (name of the leading organization);

- Type of entity of the leading partner running the website (company, public body/government, association, non-profit organization, research/academia, other);

- Partners (list of the partner organizations running the website, if any);

- Target audience of the website (business companies, government, investors, research/academia, end-user organizations, end-users, combination of the above, etc);

- Membership, relevant if the access to the website is subject to some kind of membership programmes;

- Funding/revenue model of the website (privately funded, government funded, membership/subscription fees, donations, pay-as-you-go);

- Geography (geographical scope of the website, if appropriate);

- Objective/s of the website (according to the information usually available in the "About us" section);

- Services offered on the website;

- Starting date (when the website was set up);

- Frequency of updating of the content on the website;

- Contact details.

In order to search for existing websites and portals the study team identified a set of keywords to be used on the web. The following AAL-related keywords were combined with these other "ICT", "observatory", "monitoring", "portal", and "community":

- Ambient assisted living;

- Ageing well;

- Active, healthy ageing;

- Assistive technology;

- Assisted living technology;

- Ambient intelligence;

- Domotics.

The research brought to the identification of 15 websites as the most relevant examples for the AAL Market Observatory. The websites are listed below.

Table 32 AAL-related websites identified through desk research

Website/Organization	URL	Type of website	Funding Sources
Network for the market uptake of ICT for Ageing Well	http://www.ict-ageingwell.net/	EC project website for dissemination, restricted online community	EC funding until 2014/ new BM
ALIP Assisted Living Innovation Platform	https://connect.innovateuk.org/web/assisted-living-innovation-platform-alip	Platform for knowledge sharing and dissemination	Government funding
ICAA International Council on Active Aging	http://www.icaa.cc/index.asp	online community, online shop, online magazine	Subscriptions, members fees, advertising, sponsorship, partnerships
American Health Care Association	http://www.ahcancal.org/	Online platform for healthcare community, online shop	Not-for-profit, subscriptions, online marketplace
Global Age Watch Index 2013 by Help Age International	http://www.helpage.org/global-agewatch/	Open online observatory, statistical tool	Not-for-profit, donations, partnerships
UNECE Active Ageing Index	http://www1.unece.org/stat/platform/display/AAI/Active+Ageing+Index+Home	Open online observatory, statistical tool	Not identified
European Connected Health Alliance	www.echalliance.com/	Network of partnerships	Members fees, EC funding
AGE Platform Europe	http://www.age-platform.eu/	EC project website for dissemination, restricted online community	EC funding (80%), membership fees and donations

Table 33 Relevant Comparable websites identified through desk research

Website/ community/ entity name	URL	Type	Funding Sources
EBN European Business and Innovation Centre Network	http://www.ebn.eu/	Online platform, business network	Unclear
The Eco-Innovation Observatory	http://www.eco-innovation.eu/	Open online observatory, EC project	EC funding
Cluster Observatory	http://www.clusterobservatory.eu/	Open online observatory	Unclear
European Audiovisual Observatory	http://www.obs.coe.int/web/obs-portal/home	Open online observatory, EU project	EU funding, online marketplace
Digital Entrepreneurship Monitor	http://ec.europa.eu/enterprise/dem/monitor	Open online observatory, EC project	EC funding
European Information Technology Observatory	http://www.eito.com/	Online platform, online store	Online marketplace
Grand Coalition Pledge Tracker	http://www.linkedpolicies.eu/pledge/	Open online observatory, EC project	EC funding

The study team included in the list of relevant existing initiatives some of the websites launched under European Commission projects that can be considered as good practices for the AAL Market Observatory because of the functionalities available on those websites and user-friendly approach adopted.

9.2 Positioning and characteristics

The portals were analysed on the basis of the items included in the database and reported in the previous paragraph. The main results can be summarized as follows.

The websites have different goals: we found online platforms aiming at sharing content and disseminating the project findings online, enabling the online cooperation of different stakeholders through a community and networking approach and also selling products and online services through an online marketplace.

There is a great variety of ownership options identified during the desk research but in most cases the websites are managed by partnerships of organizations. In the case of EU funded portals, the websites are managed by the project consortium and owned by the European Commission. Some websites are owned by national governments and public bodies like the innovation agencies, or by non-profit organizations.

All the websites are often addressed to multiple target categories: business organization, policy makers, researchers, service providers in the healthcare and ageing sector.

Another key element of the analysis is the level of access to the information on the websites:

- Open access if the information is accessible by anyone on the web, the content can be downloaded and the user can make use of the website for free.

- Restricted access to members only if the website cannot totally or partially be accessed by the general audience, there are multiple options:

- Mandatory registration to the website in order to make the content and services available only to a selected community of users. The approval can be subject to specific requirements that the user must have and the decision is up to the owner or an ad hoc committee.

- Membership fee to access premium content/services: in some cases, the websites are partially accessible for free while they offer premium services or exclusive content only with fee.

- Pay per access when the website is structured as a marketplace or online shop of products/services.

The analysis carried out by the study team took into account also the websites' different funding sources; the main financing options identified are the following:

- EU project/ Government/ Sponsorships/ Partnerships Advertising : research and consulting project funded by the European Commission, open online websites/portals managed and sponsored by national or local government, open online websites/portals managed and sponsored by private organizations publishing advertising on the website.

- Subscription/ membership fees: periodical fee or ad hoc fee that registered users must subscribe/pay in order to access specific content or services on the website and be part of the community.

- Online sales of content (pay as you go): anyone can buy the products offered on the website.

- Online sales of services (pay as you go) anyone can buy the services offered on the website.

- Donations: the website offers information/services for free and raises donations on a voluntary basis.

9.3 Analysis of the main business models
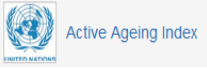
Part of the assessment carried out by the study team consisted of the analysis of sustainability aspects of the identified websites in order to draw conclusions related to the Market Observatory. Sustainability depends on the business model.

The understanding of the type of business model adopted by those websites was not always that easy. In order to carry out the analysis of the business models, the study team compared 2 main features: the source of funding and the type of access to the websites, as presented in the previous paragraph:

- Funding sources:
  - > EU project/ Government/ Sponsorships/ Partnerships Advertising;
  - > Subscription fees;
  - > Online sales of content (pay as you go);
  - > Online sales of services (pay as you go).

- Type of access:
  - > Open;
  - > Registered members;
  - > Selected Community.

Among the identified websites, the study team selected some relevant examples and developed the following analysis.

Figure 10 Mapping of "Observatory" type initiatives and their business models

| Type of access | Business Model | | | |
	Free / Sponsorship	Free + Premium services/content for payment	Subscription fees	Online sales
Open access	Global AgeWatch Index 2013			EITO
	CLUSTER OBSERVATORY			
	Active Ageing Index	ICAA		
Membership/ Community	AgeingWell			
		AHCA		

IDC *Analyze the Future* Kurt Salmon

Global Age Watch Index 2013

http://www.helpage.org/global-agewatch/

It was developed by HelpAge International from international data sets drawn from the United Nations Department of Economic and Social Affairs, the World Bank, World Health Organization, International Labour Organization, UNESCO and the Gallup World Poll. The aim of the Index is both to capture the multidimensional nature of the quality of life and wellbeing of older people, and to provide a means by which to measure performance and promote improvements.

The website is open and all data are accessible for free. The organization running the website is a non-profit organization.

Cluster Observatory

http://www.clusterobservatory.eu/

The Cluster Observatory is an online, free and user-friendly platform that provides a single access point to data and analysis of clusters, cluster organizations and regional microeconomic framework conditions in Europe. Furthermore it provides a cluster library, and a classroom for cluster education. The Cluster Observatory also produces reports on clusters and regional competitiveness conditions. In 2012 the Cluster Observatory, was separated from the European Cluster Observatory (hosted at DG Enterprise and Industry), and is now run privately by CSC in Stockholm.

At the starting phase 100% of the budget was allocated to the start-up of the website that was developed by a subcontractor of the consortium, while in the current phase the maintenance of website takes around 5%. Other relevant costs are the purchase of data from the primary sources and management which take about 50%.

The access to the data and tools is open and free for all the users. Registered users become part of the community and receive regular updates on the cluster network and can directly edit or add data to the databases.

Active Ageing Index (AAI)

http://www1.unece.org/stat/platform/display/AAI/Active+Ageing+Index+Home

The AAI wiki was developed by the European Commission and the United Nations Economic Commission for Europe (UNECE) with the aim to enhance the availability of this new statistical tool to all its potential users. The index measures the extent to which older people can realise their full potential in terms of employment, participation in social and cultural life and independent living. It also measures the extent to which the environment they live in enables seniors to lead an active life. It also provides potential users with access to an excel file that contains detailed data sets on the AAI for the EU Member States.

The access to the website and to the data is open and free. The website is financed by European Commission, DG Employment, Social Affairs and Inclusion.

Network for the Market Uptake of ICT for Ageing Well

http://www.ict-ageingwell.net/

The AgeingWell website aims at creating a Community of Actors interested in improving the life of older persons by promoting the market uptake of ICT solutions for Ageing Well. The AgeingWell website is the "show-window" of the network activities; it is regularly updated with information of the project's ongoing activities and results.

Currently the website has some sections open to the general audience that include the repository of the project deliverables, and some news. The access to the rest of the website is restricted to the associate members of the community. They offer additional services including: match-making services addressed to startups and investors in the field of ICt for ageing; research activities such as the identification and analysis of innovative business case

studies across Europe; and the organization of multiple events at national level across Europe. The estimated budget funded by the EU Programme is around 500,000; of this a significant part is addressed to the organization of the network events while the cost for the website is around 25-20% of the original budget.

The website was developed by the AgeingWell Thematic Network that is co-funded by the European Commission, Information Society and Media Directorate-General, under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Framework Programme. Until the end of the project (at the end of 2014) the website is financed by the EC. The organizations leading the website are now assessing the valuable options to ensure sustainability after the end of the EU funding.

Aging In Place Technology Watch – Industry market trends, research and analysis

http://www.ageinplacetech.com/

This is a blog focused on the US market, run by a market research firm of technology veterans in the ageing market, who also publish an annual report on the market (mainly aggregating other sources data). The blog is an aggregator of existing news, studies and links and provides comments and discussion on issues of interest for the professional community of users of ICT for ageing in the home. The audience seems to be mostly the care takers, the social associations active in the field, and other analysts not specialised in the specific market. It also appears to aim at the consumers themselves to provide easy to understand and realistic information about products and services. The blog is open access, free content and clearly is sustained as part of the communication activities of the market research firm.

ICAA International Council on Active Aging

http://www.icaa.cc/

ICAA is a commercial organization for individuals and businesses. ICAA's website is structured as a commercial online shop; the website offers an extended catalogue of products including publications, research reports, educational products, discounts and resources. ICAA has partnered with a market research organization in order to provide research reports, market data and similar products.

In order to join the community and participate to online and offline events (webinars, conferences, virtual summits etc) users have to subscribe a membership fee.

American Health Care Association

http://www.ahcancal.org/

The American Health Care Association is a non-profit federation of affiliate state health organizations, representing more than 11,000 non-profit and for-profit organizations in the care sector. The website is both an open information portal on healthcare and an online store of research and data.

EITO European Information Technology Observatory

http://www.eito.com/

The EITO's website is set as an online observatory on European and global markets in the ICT, telecommunications and consumer electronics fields. EITO is managed by Bitkom Research GmbH, and research activities are carried out in collaboration with multiple research organizations including IDC and GfK and supported by the European Commission and the OECD. EITO is sponsored by Deutsche Telekom, KPMG and Telecom Italia.

EITO's website is based on an online marketplace approach where products and services are available through a pay-as-you-go model.

9.4 Conclusions on business models and sustainability

The main goal of this analysis was to investigate which type of business models were able to sustain Observatory-like initiatives, in order to provide input for the recommendations on a sustainable strategy for the AAL Market Observatory. A business model is essentially a market strategy based on the definition of an offering package for a targeted audience paid for by a combination of funding and/or revenues. For sustainability, funding and revenues must be sufficient to reward past investments and maintain the offering. We selected 16 initiatives, of which 8 active in the AAL market space and 8 which could be defined as Market Observatories (such as EITO or the Cluster Observatory). We were particularly focused on web portals initially launched as EU-sponsored initiatives, to understand if and how they moved towards sustainability, and/or initiatives addressing professional communities with a strong element of ICT innovation, rather than consumer-oriented blogs and the like.

While this is a small sample compared to the Internet world, it is sufficient to provide a good picture of the main challenges faced by online Observatories and how they can be dealt with. Based on our analysis, the main common challenges appear to be the following:

- Designing an appropriate mix of content and services responding to the targeted audience needs;

- Managing the collection, aggregation, presentation and delivery of value-added content, within the cost-benefits balance of the revenue model;

- Achieving visibility in the crowded internet world;

- Managing the interaction with the online community/visitors of the website and delivering good quality services.

Interestingly enough, there do not appear many different solutions to these common challenges. Broadly speaking we found two main business models:

- Providing open access to free content to gain visibility; costs are paid for by the owners of the website who gain other benefits (for example selling other services, such as market research), or are no-profit organizations who include the website in their communication activities (sponsorship model). This is the case for example of the Global Age Watch Index, the Active Ageing Index, the Cluster Observatory, the Aging In Place Technology Watch blog.

- Providing some free content, but mainly value-added content and services with access restricted to the targeted professional community, sustained by subscriptions or selling data. This is the case of the portals run by industry associations, such as ICAA (the International Council on Active Aging), AHCA the American Health Care Association, or EITO.

We did not find evidence of websites sustained by advertising only, which is the mainstream revenue model on the Internet. The reason is probably because these initiatives do not so far address the mainstream consumer market and their attractiveness for advertisers is not high.

European projects represent a variation on these models. Normally they start off with the sponsorship model, fully paid for by the European Commission. The majority of them are closed when the funding ends, the websites are kept open but without updating contents they become rapidly obsolete. Recently there have been a few more efforts to keep these initiatives alive through sustainable models.

This was the case of the Cluster Observatory. This was run for many years as an EU project, then one of the leading contractors, the Centre for Strategy and Competitiveness of the Stockholm School of Economics decided to take over. The Observatory collects, elaborates and publishes data on EU industry clusters. The initiative is sustainable because all the development work of the databases was done under the EU project. Nor the maintenance of the

website takes only 5% of the running costs. The CSC considers this research as part of their research activities and the reward is their visibility and leadership on the topic, which enhances the reputation of the business school. Interestingly, they offer match-making services for innovative initiatives looking for funding through a specialised closed platform linked to the Observatory website. This shows how the sponsorship model can still sustain an Observatory even if the original sponsor, the EC, is not willing to continue.

A different case, still in the making, is the Network for the Market Uptake for Ageing Well, led by INOVA (a EU-funded Thematic Network). The information resources present on the website are being shared only with the community, but their main value added is value-added services (match-making innovators and investors, assessing the validity of business cases of implementation, organizing events). They are looking into ways to leverage the community to make it sustainable. They appear to be complementary with the objectives of the potential AAL Market Observatory.

None of these experiences are run in purely commercial terms; that is none of them can sustain themselves only through the sale of data and services. EITO is the initiative coming closer to a commercial model, since their website is mainly designed to sell their periodic reports. However, Bitkom, the German IT trade association and show running EITO, acknowledges the difficulty and admits that sales do not cover all the costs of the production of the reports.

In conclusion, a sustainable business model in the AAL space appears to require a combination of revenue sources, probably leveraging sponsorships and pay-as-you-go models for some content and services. Open access and free valuable information seem to be a critical success factor, in order to reach out to audiences in the Internet environment; subscriptions for a flat fee seem more difficult to manage. So far advertising seems of little value in this world, but this might change if the AAL market grows fast.

10 Conclusions and recommendations

10.1 The need for an AAL Market Observatory

There is no doubt that the AAL market is growing beyond its traditional boundaries and this is attracting a growing interest by potential investors, the ICT industry and all service and care providers. The double factors of demand pull (by the rapidly growing population of the elderly) and technology push (developing new ICT solutions and services) are combining to deeply modify the very landscape of the market. More important, the market is evolving from a mainly public market (sustained by public payers such as social care and healthcare service organizations) to a public-private market with an increasing relevance of products and services paid for directly by end users with out-of-pocket money. This means that more ICT vendors and service organizations are becoming interested, with a growing overlapping with the consumer electronics market.

Within this context, our research has confirmed that there is plenty of information and data around, but it is most often incomplete, lacking coherence and comparability, of uneven quality and reliability.

The majority of stakeholders agreed that this lack of information and transparency can influence negatively the development of the market, particularly in Europe. The reasons why are clearly shown in the Figure below about the main barriers to growth in the next 3-5 years in the AAL market. The most relevant barriers mentioned by stakeholders are directly related with the lack of market intelligence. Surely lack of awareness should be fought with better information and communication; the policy and economic leaders who do not provide sufficient support must be convinced with facts and trends; the availability of clear business cases and evidence on social benefits would help to make investment decisions. A Market Observatory would help to fill these information gaps.

Figure 11 Opinions on Main Barriers to AAL Market growth in the next 3-5 years, May 2014
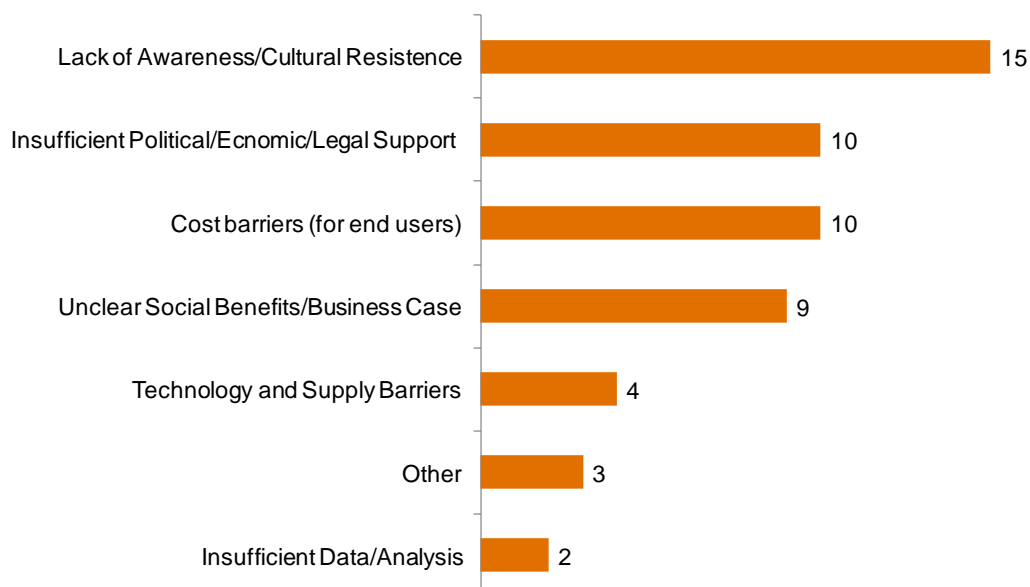
Source: Workshop Experts survey, IDC elaboration, N. Respondents: 17; multiple answers

The stakeholders agreed and confirmed the classification of relevant market information suggested by the study team (core monitoring data), including monitoring the market, the main players and the IPOs and investment opportunities. This is reflected by the stakeholders' ranking of the most important ways in which the potential Market Observatory

could help the development of the market, shown in Figure 11 below. The priority shared by all was the need to showcase emerging innovations and ideas, so as to provide visibility to researchers and potential entrepreneurs in front of potential investors. But providing market intelligence on potential demand was considered equally important as well as providing data and information on the suppliers and their marketing portfolios. The lack of a common classification of the market segments and solutions is a barrier to the successful achievement of all this.

Figure 12 Opinions on the role of the AAL Market Observatory

Question 6: How can an AAL Market Observatory support the development of the market? Indicate the 3 most important factors in ranking of importance
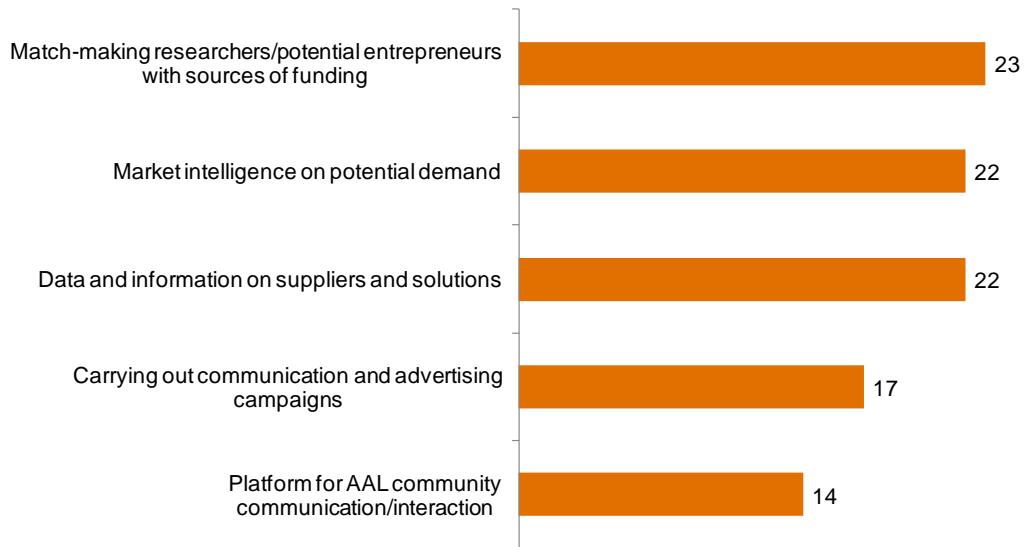
Source: Preliminary Participants survey, IDC Elaboration, 17 respondents (multiple answers) – the ranking is based on the aggregated score of all respondents answers, with factor ranked 1st = score 3, ranked 2nd = score 2, ranked 3d = score 1, no mention = score 0

While our research shows common information needs by all stakeholders, going more in depth we find also different priorities, correlated with their role in the market. They can be summarised as follows, based on the classification of stakeholders identified by the study.

Demand-side stakeholders:

- Health and care providers, being responsible for the implementation of new services, are particularly interested in trusted information about actual implementations, benefits achieved, negative and positive impacts on the social system, which technology solutions are mature and proven. There is also interest in the emerging solutions and ways to evaluate them, in order to make informed decisions about innovative services – possibly through trusted peer-review mechanisms based on objective evidence.

- For these reasons, health and care providers, as well as other secondary users (i.e.: informal care providers, family members, friends, neighbours, etc…) would particularly benefit from an Observatory having as primary mission to represent the main reference source of trusted and high quality information and data on the market (model A; see Executive Summary and 9.4 Conclusions on business models and sustainability). Its combination of data and online services would satisfy the secondary users' needs of keeping up-to-date with the latest AAL market's products and services in order to improve quality of care and find the best balance between service level and costs to be sustained.

- The interest of secondary users in this type of observatory would also enhance the possibility of adopting a business model based on a mix of sponsorship and pay-as-you go services. While sponsorship would pay for the

considerable start-up costs of the observatory, the very presence of (primary and secondary) users would ensure a wide basis of potential payers for "pay-as-you-go" services, thus improving the overall sustainability of the observatory.

- Main payers (tertiary users) such as government agencies, insurances and pension funds share the interest in benefits achieved and emerging solutions. Since they are mainly responsible for funding rather than implementation they are particularly focused on the business case for new solutions and applications (including for example data on the return on investment (ROI), the cost-benefits balance and the revenue and payment models (for example, if a final user payment should be foreseen or expected). In addition, they are concerned with the influence on the market of the national policy and regulatory systems, in terms of safety/security requirements for new products and services, payment/funding models, the overall legal framework influencing privacy and data protection.

Supply-side stakeholders:

- Business actors (large enterprises but also high-tech, high growth SMEs) prioritize the analysis of emerging demand and the willingness to pay particularly by final customers (the famous "out-of-pocket" money), since the emerging products and services often have a consumer dimension (such as remote monitoring apps working on iPhones, or the new wearables).

- Research and innovation actors, often participating in EU research projects, start-ups, investors such as venture capitalists and business angels, are most interested in the Observatory becoming a key reference source for potential investors, where they could present their new solutions and potential ventures to potential investors. Likewise, investors are interested in such a source to look for the next good business opportunity. As remarked above in chapter 7, there is no information yet specific to the AAL market in this field in Europe.

Policy Stakeholders

- The AALA partners as well as the leaders of the EU initiatives complementary to the AAL Programme (the EIP-AHA, the Better years JP) are primarily interested in overall information about the market dynamics and the time of development and exploitation of AAL technologies, in order to improve overall governance and bridge the research-market gap.

- National and regional industry policy makers, innovation development agencies, agencies promoting regional "smart specialisation" strategies, are looking for new businesses to support and barriers to remove, and are interested to learn about potential bottlenecks to the market development, as well as worthwhile enterprises to attract and support.

10.2 Sourcing the data for the Observatory: filling the gaps

The assessment of data availability and quality carried out through the desk research in Europe and the main world regions provided clear, but unsatisfactory results. The requirements of a potential Market Observatory about full coverage across Europe, regularly updates, transparency of data collection, quality and reliability, are only occasionally fulfilled, as shown by the previous chapters.

Concerning the market and main players monitoring areas in Europe the main considerations are the following:

- There is a high number of information sources and reports, providing quali-quantitative information and data, but they follow a huge variety of taxonomies and market segments definitions;

- The only category of data fully available and covered by statistical offices is demographic data on potential demand; this is complete, with full coverage of the EU28, and regularly updated.

- The main sources of data on market size, value, take-up and actual demand, market shares of the main players are private market research companies; this means that data are only partially public, methodologies are not fully transparent, and data are not necessarily regularly updated.

- The requirements of a potential Market Observatory about full coverage across Europe, regularly updates, transparency of data collection, quality and reliability, are only occasionally fulfilled, as shown by the previous chapters.

- We have examined the different typologies of data and suggested actions to fill the gap (see table 21). They require establishing partnerships with various groups of stakeholders to get their collaboration to extract data, or in alternative to carry out original data collection and field research to generate new market data.

For these typologies of data the situation is similar in the other world regions, even though in the US and Canada there is certainly more and better information, it is difficult to use it for comparative purposes. For example, in order to provide better market intelligence, it would be useful to compare take-up rates and barriers for similar typologies of products between Europe and the US. Again this is not possible in the current situation.

Concerning the availability and quality of data on investment developments, including funding initiatives, investment facilitators, M&A and start-ups, the main considerations are the following:

- There are many specialised databases and data sources with a global coverage (not only Europe) such as CrunchBase, Venture Deal and others providing high quality data across a broad range of technology domains, but they do not usually offer ready-made information on the specific AAL field.

- By combining these sources with news websites, country specific sources, and Internet information it is possible to extract news and information on start-ups and M&A (mergers and acquisitions) in the specific AAL field. But this would require specific ad-hoc research to be carried out periodically in order to fill in the Observatory in this field.

  In summary, this is not a situation where we may have to fill in some data gaps in order to complete the Observatory. If we want to provide valuable information and data there is a need for additional elaboration and possibly field research to bring all the data required for the Observatory to the necessary level of quality and coherence. The amount of work required will depend on the choice about the level of detail and depth of the Observatory (for example, should the Observatory provide market data once a year only for the entire EU, or provide specific datasheets for each Member State?). Assuming naturally that more precise data and information would be better in principle; the real question becomes the feasibility and affordability of such efforts within a sustainable business model.

  In order to fill in the missing data the following approaches must be considered:

- Develop a coherent map of the AAL ecosystem (current and emerging) and an updated, flexible classification of solutions and technologies, suitable to evolution in time. This should take into account the results of the main AAL-funded projects and also of the main market studies, in order to develop a common language between the technology innovators and the market. The resulting map and landscaping should be the foundation of the AAL Observatory, open to feedback and updating based on stakeholders inputs as well as market evolution.

We have considered all the existing taxonomies and have suggested in this report an indicative market definition framework. However, there is a need for a shared, consensus based set of classifications and definitions promoting a

shared view of the market and its main evolution trends. If the AAL programme adopts and promotes a coherent market definition framework, this will become a cornerstone of the reputation of the Market Observatory.

Once the market definition is finalized, the data collection strategies could be the following:

- **Use automated data collection tools on the Internet** and data mining, big data analytics and semantic technologies to extract significant data and present it with advanced data visualization techniques. This approach is particularly useful when dealing with unstructured, quali-quantitative data as in our case. There are several young companies in Europe developing innovative tools and providing high-quality services of this kind.

    > **Pros**: this method is very cost-effective and once designed, after the start-up phase, could lead to frequent updates, almost real-time, very appreciated by potential investors. Clever aggregating and elaborations can lead to considerable market intelligence.

    > **Cons**: the quality of results depends on the quality of the materials collected. If the data on the players market shares is not public, for example, it cannot be collected.

- **Commission a private research company** to carry out periodical field research and surveys in order to measure the most relevant indicators.

    > **Pros**: this method allows full control of the scope and quality of results, depending on the size of the survey sample. It also allows applying the Observatory segmentation and publishing original results, with high thought-leadership results.

    > **Cons**: field research is expensive, for example a survey of a representative sample of European enterprises across the EU28 may cost up to EUR half a million, even if extrapolating techniques cold be used. The update or results depends on the frequency of the field research.

- **The third alternative is to stipulate partnerships with data holders** organisations (patient advocacy groups for potential users; AAL national associations for tracking national initiatives...) to receive periodical data from them. These data could be harmonized and aggregated (if common, standardized definitions could be agreed upon) or simply presented (in this case the Observatory would act as a showcase, one-stop-shop for such data).

    > **Pros**: Once established, this approach is cost-effective and potentially high quality. Also, it creates multiplier effects for dissemination and communication of results, as the partner organizations have a stake in the visibility and success of the Observatory.

    > **Cons**: This approach is very time-consuming to set up and requires to identify the appropriate incentives for the potential partners (visibility for example) and to make sure that they can source and provide the data needed. Also, it may generate long discussions about the precise definitions of the indicators (since organizations collect data with different specifications).

- **Finally, leverage social media and networking activities** to collect data and information (Crowdsourcing, blogs, events).

    > **Pros**: this approach is very low cost, requiring only some manpower to animate the online network. Also, it may provide unexpected results.

    > **Cons**: the results are difficult to foresee and the control of the quality and timing of information is not high. For a Market Observatory requiring in principle predictable timing and quality control, this approach is not the best, even though it can be used as a complementary tool.

Whatever the method of data collection selected, there will always be the need for final quality check, control of consistency and analysis of results by a competent analyst organization.

10.3 Suggested strategies for the AAL Market Observatory

We wish to suggest two possible alternative models for the AAL Market Observatory, based on a different mix of offering and strategic positioning. They were originally discussed at the stakeholder workshop and have been developed by the study team on the basis of the desk research and the analysis of sustainable business models.

Both Observatory models exclude to address the end users whose information needs will be covered by the planned AAL Information Portal.

The suggested models are the following:

A. The AAL Market Observatory as the main source of trusted and high quality information and data on the market.

B. The AAL Market Observatory as a digital catalogue of all the main sources of data and information on the market.

They are described more in detail below. Their common elements are outlined in the concluding paragraph.

10.4 The AAL Market Observatory as the reference source

10.4.1 Mission and Value Proposition

The mission is to become the main reference source of trusted and high quality AAL market intelligence, recognized as such in Europe and in the world.

The value proposition of this Observatory will be to provide value-added information and services suited to the needs of each of the main stakeholder categories in the professional stakeholder community, enabling them to make informed investment decisions and promoting the development of the European industry in the field.

10.4.2 Offering Portfolio and Targeted Audience

The Observatory will target the professional stakeholder community and tailor its offering to each of the main stakeholder segments: health and care providers; main payers' organizations; business and industry associations; researchers and innovators; start-ups, investors and venture capitalists; policy makers and naturally the AALA partners.

The main offering portfolio should include:

- A library of coherent and updated data covering the four main monitoring areas identified as core by the study, including:

    > Monitoring the Market evolution in the following sections:

        o A periodically updated report on the market taxonomy and its evolution;

        o Actual and potential demand;

        o Market value and size;

        o Market trends and drivers of evolution;

        o Interoperability and standardization.

> Monitoring the main players in Europe and the world;

> Monitoring the market evolution in the US, Canada, China, India and other relevant world countries;

> Monitoring investment-related developments including:

  o Data on number, type and size of funding initiatives;

  o Data on investment facilitators such as Business angels, accelerators, incubators;

  o Data on M&As and IPOs in the AAL field globally;

  o Data on start-ups in the AAL field.

All the data and information shall be verified and validated by the Observatory managers, also through peer reviews. No data will be published without documentation on sources and methodology of data collection and elaboration, aligned with scientific best practices. A quality label might be used to signal which data has been directly produced and/or validated by the Observatory team and which is simply published.

The information and data should be provided on the basis of visual analytics tools, user-friendly and interactive.

The observatory managers will periodically extract updated information, data and interesting stories to feed into a newsletter.

The Observatory data will be provided for the total EU and possibly for individual MS. There will be links to national level reports and sources.

The Observatory should offer the following services:

- A showcase of emerging solutions and new company business ideas by AAL-engaged researchers and innovators, open to potential innovators, selected by the Observatory managers (perhaps with a two tier system for early and more advanced ideas). This could be a partnership with the match-making of innovators service launched by the Network for ageing well.

- A meeting place for the main stakeholders, with restricted access, to share knowledge, experience, and possibly validate solutions.

- A consensus based definition of good-practice criteria and a library of business cases with actual impacts and benefits data.

- A collaborative platform offering the opportunity of crowdsourcing for answers to problems in the deployment and implementation of AAL technologies.

- The organization of an annual event for the stakeholder community with prizes for the most innovative companies, to be selected through an evaluation methodology developed by the Observatory managers and voted on by the stakeholder community.

10.4.3 The Business and Organizational Model

The business model of the Observatory should be based on a mix of sponsorship and pay-as-you-go services. More specifically:

- In the start-up phase there will be high costs to design and launch the Observatory, establish the services, open and run the website, launch a communication campaign. In this phase the costs should be covered by sponsors, possibly a combination of the EC and other actors (national AAL associations? Large vendors?).

- The Observatory should establish immediately partnerships with national AALs and other actors such as industry associations and global IT vendors willing to provide some input and knowledge, but also to eventually provide some funding support in exchange for visibility and the chance to shape the indicators and data to be elaborated. Another potential partnership could be with a leading University business school, or research centre specialised in the AAL market.

- Once the reputation of the Observatory is made, the Observatory could start asking for payment for some of the services, for example match-making innovators and funding organizations and the meeting place for professional stakeholders. This could be supported by for example organising executive dinners for pay, or visits to good practice experiences.

- The annual event should be self-sustainable by asking participants for a fee, as with main EC conferences. This should be done from the start, perhaps with a lower fee in the start-up phase.

Data Collection methods

To collect and produce data to feed the Observatory it will be necessary to use a combination of the following data collection methods:

- Automated data collection on the Internet and data analytics to provide periodically updated information for all monitoring areas;

- Networking with other existing portals and sources;

- Ad-hoc field research only to assess the market current and forecast value and the addressable market (potential demand) once a year, to feed into an annual report;

Observatory Management and Quality Control

The management of the Observatory will require the following mix of skills and tasks:

- Capability to design, set-up and run an online Internet portal, managing periodical updates, and a communication/media campaign also through social media to increase its visibility, producing a newsletter;

- Capability to set-up and animate an online collaborative platform for stakeholders, including crowdsourcing services, and a meeting place reserved for registered stakeholders;

- Capability to establish an effective and ongoing networking strategy with the main stakeholders representatives and with the main websites producting data and content;

- Capability to design an appropriate data collection strategy, to collect, organize and produce data to feed the Observatory according to the necessary requirements of quality, reliability and coverage. This should include the capability to develop an updated and coherent definition of the AAL market; to consult the main stakeholders to validate the definition; to design and carry out original field research where needed in order to produce data; capability to use automated data collection tools on the Internet and data mining, big data analytics and semantic technologies to extract significant data and present it with advanced data visualization technologies; and periodical updates of the methodology and scope of analysis to keep pace with the evolution of the market;

- Capability to design and implement an appropriate quality management and control strategy to insure that the published data is trusted and recognized of high quality by the stakeholder community;

- Capability to design, launch and organize an annual event presenting the Observatory results.

These capabilities may be provided by a consortium or a single professional organization. We recommend to include a scientific steering committee revising once a year the methodology approach and the quality of data and information published, providing a sort of "quality label" of the Observatory.

At this stage there are too many uncertainties to provide an estimate of cost-benefits, however the main investment items required to launch and operate this business model are presented in the table below.

Table 34 – Indicative list of main investments required

Item	Description
Design, set-up and run the Internet portal	Standardized, commodity services
Communication and media campaign of the portal	Limited investment: the visibility of the portal is planned to grow gradually based on word of mouth by stakeholders
Networking strategy	Limited investment
Animation and management of collaborative platform	This requires ongoing support by specialised staff – say 1 FTE person per year
Data collection strategy and methodology design; ad hoc market research; production of annual report	This is likely to be the main source of costs (because of the need to use only high quality data). As an indication, an ad-hoc survey of a representative sample of enterprises in each of the EU28 MS may cost around 450,000 EUR (IDC estimate). But there are methods to extrapolate data from a sample including a smaller number of MS.
Showcase of emerging solutions and business ideas	Some management costs to collect, screen, revise submissions on the basis of quality criteria and a standardized template.
Use of automated data collection tools on the Internet and data visualisation	Depending on the scope. A ballpark cost of 100,000 EUR per year would provide a very rich and high quality service constantly updated.
Quality control and Steering Committee	A ballpark figure of 2-5% of total costs.
Annual event	An annual conference by EC programmes (such as DG CNECT e-challenges) with approximately 2000 participants may have a budget of 1 Mil EUR, much of it participation costs (without registration fees).

10.4.4 Development strategy

The Observatory should start with a staged approach, developing a core set of data and services and then gradually expanding. It will be important to grow gradually and adjust to the audience reactions, particularly the interactive services. A starting point could be to focus on Europe and the core market development data, adding the data on market players on the second year.

10.5 The AAL Market Observatory as a content aggregator

10.5.1 Mission and Value Proposition

The mission is to become the best known digital catalogue and content aggregator of the AAL Market – something like the Huffington Post for AAL.

The value proposition is to be a user-friendly single point of access to databases and news on the AAL market, through extensive partnerships and links to main data sources, and to publish lively blogs, posts and comments to

data in the main EU languages. This is a "light" approach to the Observatory, compared to the one designed above which requires considerably greater central management, organization, and data collection and elaboration. This Observatory will not produce special reports but news, and focus on links and visualisation of third-party information rather than create its own information. Still, the information collection will be sufficiently extensive and rich to also support the stakeholders in making informed investment decisions. . The "blog" approach could be similar to that of the "Aging in Place" US blog.

10.5.2 Offering Portfolio and Targeted Audience

The Observatory will target the professional stakeholder community in all its components. It will focus on interface design and visualisation to satisfy the information needs of all the main stakeholder categories.

The main offering portfolio should include:

- A library of well-referenced links, with some meta-data on the typology of available sources covering the four main monitoring areas identified as core by the study as discussed above.

- The information and data should be provided on the basis of visual analytics tools, user-friendly and interactive.

- The Observatory data will be provided for the total EU and possibly for individual MS. There will be links to national level reports and sources. Unless the relevant data is free and open access, it will not be used.

The Observatory should offer the following services:

- A showcase of emerging solutions and new company business ideas by AAL-engaged researchers and innovators, open to potential innovators, with a very light screening process by the Observatory managers. The entrepreneurs and innovators should be responsible for most of the organization and presentation of the content, based on a light standardized template. This could be a partnership with the match-making of innovators service launched by the Network for ageing well.

- A meeting place for the main stakeholders, with restricted access, to share knowledge, experience, and possibly validate solutions.

- A consensus based definition of good-practice criteria and a library of business cases with actual impacts and benefits data.

- A collaborative platform offering the opportunity of crowdsourcing for answers to problems in the deployment and implementation of AAL technologies.

- The organization of an annual virtual meeting and webinar for the stakeholder community, with prizes for the most active collaborators of the portal.

The Business and Organizational model

The start-up phase will be much lighter and faster to organize than in the other Observatory model.

The business model will be low cost, based on gathering free available data and partnering with other stakeholders to link their databases. The Observatory should establish immediately partnerships with the main stakeholders with relevant databases and look for sponsors willing to provide some funding in exchange for visibility and perhaps even some advertising. This type of observatory is by definition open access and free content. It could also join forces with news sites and blogs.

Data sources and data collection

To produce data the Observatory will use the following methods:

- Automated data collection on the Internet and data analytics to provide periodically updated information for all monitoring areas;

- Networking with other existing portals and sources.

Observatory Management and Quality Control

The management of the Observatory will require the following mix of skills and tasks:

- Capability to design, set-up and run an online Internet portal, managing periodical updates, and a communication/media campaign also through social media to increase its visibility;

- Capability to set-up and animate an online collaborative platform for stakeholders, including crowdsourcing services, and a meeting place reserved for registered stakeholders;

- Capability to establish an effective and ongoing networking strategy with the main stakeholders representatives and with the main websites producing data and content;

- Capability to design an appropriate data collection strategy, to collect and present data and data sources, feeding the Observatory according to the availability of data, exploiting at best existing sources;

- Capability to use automated data collection tools on the Internet and data mining, big data analytics and semantic technologies to extract significant data and present it with advanced data visualization technologies; periodical updates of the methodology and scope of analysis to keep pace with the evolution of the market;

- Capability to design and implement an appropriate quality management and control strategy suited to the Observatory status and role;

- Capability to design, launch and organize an annual virtual meeting presenting the Observatory results, linked with the communication campaign.

These capabilities may be provided by a consortium or a single professional organization. In this case a scientific steering committee should not be needed.

At this stage there are too many uncertainties to provide an estimate of cost-benefits, however the main investment items required to launch and operate this business model are presented in the table below.

Table 35 – Indicative list of main investments required

Item	Description
Design, set-up and run the Internet portal	High quality service, since the quality and visibility of the portal is key
Communication and media campaign of the portal	Important investment in the start-up phase: the visibility of the portal should be immediate in order to multiply links with data sources. Once established, a much lower annual investment should be required to maintain and refresh the image of the portal
Networking strategy	Medium level investment to connect with stakeholders
Animation and management of collaborative platform	This requires ongoing support by specialised staff – say 1 FTE person per year
Showcase of emerging solutions and business	Low management costs to collect and publish submissions based on

Item	Description
ideas	minimal quality screening and presentation criteria (example, the e-Government best practice cases on ePractice)
Data collection strategy based on the use of automated data collection tools on the Internet and data visualisation	Depending on the scope. A ballpark cost of 100,000 EUR per year would provide a very rich and high quality service constantly updated.
Quality control	A ballpark figure of 1% of total costs.
Annual event	A virtual meeting would require very low marginal costs in addition to the communication campaign and networking strategy with stakeholders

10.5.3 Development strategy

The Observatory should assemble a sufficient volume of links and data sources before becoming active. These types of digital catalogues are immediately discarded by Internet users if they do not show good content from the start.

The start-up phase will need to be covered by the EC perhaps in combination with a few other sponsors. However the managers should immediately look for other sponsors and supporters to move towards sustainability.

The Observatory should launch a communication and media campaign to insure its visibility and become known to the main stakeholders, with a "big bang" approach rather than a gradual growth. The communication and media campaign should also push the annual communication event, leveraging all social media channels.

10.6 Summary view

The two models of Observatory have different strong and weak points which are briefly summarized in the table below and commented here.

Satisfaction of stakeholders' information needs

There is no doubt that the "reference source" model would satisfy the main information needs expressed by the main stakeholders, particularly the demand stakeholders because of the focus on trusted and validated information and data and the support to share and compare information.

The second model the "digital catalogue" would provide a one-stop entry point and easy access to all relevant information and data, but would not provide comparability, quality control and validation. Therefore it would satisfy some information needs, especially those of investors and start-ups interested in showcasing emerging solutions and business ideas, but would not satisfy completely the demand stakeholders and the policy makers.

Both models would provide a collaborative platform and interaction support, with the first focused on the professional community and the second less structured and therefore more open to spontaneous interactions and contributions.

Communication and media impacts

The "reference source" model is more oriented towards visibility within the professional community. The investments would focus more on the production and presentation of data rather than building up the image. The second model would have higher communication and media impacts since it needs to build immediate visibility and links to implement its "digital catalogue" model.

Quality and reliability of data – Variety of data

These two aspects are opposite. The "reference source" would focus on quality and reliability and therefore screen/exclude data and information of low quality, even if would mean not covering some subjects or areas. The second model is open to all data because it does not provide any screening and quality control, it simply provides access to data.

Showcasing new businesses

We believe that this service is key and necessary for both models. The type and approach would change given their different approaches; the "reference source" would manage the process of selection of new business ideas and keep them to a standardized template, while the "digital catalogue" would provide only minimal screening and require minimal presentation standards.

Start-up investments and Operational costs

While it is difficult to estimate exactly the level of start-up costs, they will probably be higher for the first model, whose structure is more complex and with a wider offering portfolio. The design and start-up of the online platform is a common element. However the operational costs of the first model will be higher because of the ongoing need for data collection, ad-hoc research, and elaboration and quality control of data. The second model will have higher communication costs in the start-up phase but much lower management costs in the operational phase.

Business model sustainability

Both models are potentially sustainable. The "reference source" model however will required higher revenues sources to become sustainable, because of its higher ongoing operational costs, and will probably always need sponsors. The "digital catalogue" model will require lower revenues and might even exploit advertising, so it has a higher chance to become self-sustainable.

Table 36 – Comparative evaluation of the Observatory models

11 Evaluation aspects	The AAL Market Observatory as the Reference source	The AAL Market Observatory as a Digital Catalogue
Satisfaction of stakeholders information needs	Very high	Medium
Communication and media impacts	Medium	High
Quality and reliability of data	High	Low
Variety of data	Medium	High
Showcasing new businesses	High	High
Start-up investments	High	Medium
Operational investments	High	Low
Business model sustainability	Medium	High

10.7 Recommendations

Based on the results of our research these are our recommendations.

- There is an objective need for better information and data on the AAL market and its evolution, requested by all stakeholders. Therefore the AALA should proceed with its plans for a Market Observatory targeted at the professional stakeholder community.

- The Market Observatory should cover the four areas identified as necessary and sufficient to provide market intelligence: they are monitoring the market evolution in Europe, monitoring the main players, monitoring the investment-related opportunities, monitoring the market evolution in the rest of the world, in order to provide comparisons with Europe.

- In our opinion, the optimal format to develop the Observatory is the first one (model A) with the mission to become the main source of trusted and high quality information and data on the market. Its combination of data and online services guarantees to satisfy the information needs of stakeholders and to support their informed decisions. It does require a high level of investment, particularly in the start-up phase. The combination of products and services should be tested in such a way to progress towards sustainability through also pay-as-you-go services.

- The alternative model (the AAL digital catalogue) is lighter in structure, with a narrower focus, and lower costs (since it excludes ad-hoc research to create the missing data). Therefore it could achieve sustainability faster. This second type of Observatory will also satisfy the needs of stakeholders, even if with less quality and at a lower level of reliability (since all the data is collected instead of produced). It would rely more on motivating and engaging stakeholders, rather than informing them and providing content.

Annex 1 – Methodology

The study leverages a wide range of data sources and applies several research methods to present the results and base the report conclusions and recommendations. The key methodology steps which were undertaken to conduct and realize the study are summarized below.

Desk Research:

The study team was first confronted with the task of obtaining the necessary context and background information and then devise a viable and operational definition of the AAL market. To do so, the study team performed ad-hoc desk research among several secondary sources, including:

- Existing IDC's standard and custom research in the healthcare sector;
- Existing publications and studies from the AAL Association;
- Existing publications from academia and other research institutes;
- Specialized press;
- Dedicated websites of relevant AAL stakeholders in Europe and worldwide.

The sources above were used to devise a workable definition of the AAL market articulated along a proposed value chain and subsequently differentiated between a supply-side view and a demand-side view of the market. Desk research was also instrumental in creating a detailed description of the technology framework underpinning the AAL market and identifying the main stakeholders' categories involved in the AAL market.

The secondary sources indicated above were also used to identify the main areas of the AAL market to be monitored and classify data according to a specific typology. With regards to data validation and availability, additional desk research was conducted to leverage data from the following key sources:

As suggested in the Inception Report, the desk research systematically leveraged data from the following key sources:

- AAL JP documents, the AAL JP projects documents where relevant. Since it is assumed that these documents are already known to the project sponsors, less emphasis was placed on assessing and evaluating them for applicability to the Market Observatory.

- Reports published about the AAL market;

- Websites/documents published by the main AAL partners and national initiatives;

- Official statistics websites, starting with Eurostat, OECD and the national statistical institutes of the main EU MS;

- Ministries of Health and Ministries of Welfare studies, Think Tanks, etc;

- IDC's databases on the main ICT solutions related to the AAL market;

- Public reports by other market research companies, such as Forrester or Frost & Sullivan;

- Sources indicated by the stakeholders during the stakeholder consultation.

Use of Keywords

In order to ensure a broad level of enquiry coverage a variety of keywords and phrases and combinations were used during the desk research (examples are shown in 5.1.1, Table 7). Over time, these were used in conjunction with other words or in combination with each other. As the search progressed, they were used in conjunction with words or phrases connected with specific technologies or solutions, e.g., sensors, mobile, safety alarms.

The desk research for the current final report was conducted predominantly in English as the key sources identified by the study team were essentially found in this language. The study team was also able to identify additional sources in other languages such as French, German, Spanish and Portuguese. The desk research was conducted primarily in Europe, and in selected non-European countries, namely: The US, Canada, and Asia-Pacific markets. South America and Africa were not taken covered by the desk research approach.

When it comes to the actual data collection and data sources methodologies and the running of the Market Observatory, the study team has suggested the usage of automated data collection tools on the Internet and data analytics/business intelligent tools (see 10.3 and 10.4). It should be noted that the cost for acquiring the necessary intellectual property rights (IPRs) of such tools, as well as the need to have such tools in at least the most widespread European languages (in addition to English) woud need to be taken into account when planning for the start-up costs of the Observatory.

Stakeholders' Workshop

The actual feasibility of creating a Market Observatory in the AAL field was further validated through the workshop *'AAL Market Observatory – Identifying Stakeholders' Needs'*.

The workshop aimed at bringing together a group of highly qualified and relevant stakeholders in the AAL field across Europe and among a wide range of different organizations (industry associations, large businesses and small & medium enterprises, health and care providers, payers, research & development organizations, academia, public and non-for-profit organizations, etc.) to collect their views and feedback on the preliminary study results and the implementation of a Market Observatory in the AAL field. Prior to the workshop, confirmed participants were asked to complete a preliminary short survey in order to help the study team to better to prepare the interactive sessions of the workshop and make them more effective. All answers were elaborated and presented in an aggregated way.

The workshop was conducted in an interactive fashion, based on a predefined agenda. The study team facilitated interactive sessions and break-out panels in order to gather stakeholders' information needs on the AAL Market, their opinions and views on the possible role of the Market Observatory, as well as the potential business models to ensure the sustainability of the Observatory.

Preceded by a preliminary surveying, and a careful selection and recruitment, the workshop brought together a group of highly qualified and relevant stakeholders in the AAL field across Europe and among a wide range of different organizations (industry associations, large businesses and small & medium enterprises, health and care providers, policy makers, research & development organizations, academia, public and non-for-profit organizations, etc.) to collect their views and feedback on the preliminary study results and the implementation of a Market Observatory in the AAL field. In particular, the workshop called together stakeholders from these types of organizations:

- Business actors, with large enterprises, SMEs, and start-ups;

- Research and Development actors, including university and clinical research, private and public research institutes, foundation, standardisation bodies;

- Health and Care provider associations;

- Associations, such as regional and local e-Health innovation centres, national e-Health foundations, and e-Health centres;

- Investors, such as venture capitalists and business angels.

- Policy makers, such as the European Commission, DG Communications Networks and Technologies.

The workshop allowed the study team to better apprehend the stakeholders' needs in the AAL field and propose a viable model of the Observatory under investigation. The workshop's results are summarized in Chapter 3 of the present report.

In-Depth Interviews

To collect information on comparable initiatives and then derive meaningful conclusions and actionable recommendations, the study team conducted a limited number of in-depth interviews with organizations directly involved in managing existing similar endeavours in different areas than the AAL. The study team developed an interview guideline which served as a checklist of topics to be covered, allowing for interaction with the interviewee. Each interview was conducted in English and lasted approximately one hour.

The interviews write-ups are available in Annex 2 of the present report.

Annex 2 – Interview write-ups

Cluster Observatory

Identification

Name of interviewee	Sergiy Protsiv
Title	Project Manager
Organization	Center for Strategy and Competitiveness (CSC) at the Stockholm School of Economics
Contact info (email + telephone)	+46 8-736 95 11 Sergiy.Protsiv@hhs.se
Country and location	Sweden
Date of interview	01/07/2014
Place of interview	Telephone interview
Name of interviewer	Stefania Aguzzi
Does the Interviewee wish to be quoted or prefers to be anonymous? During the interview, please specify which data or content can be quoted, if any	
Yes you can quote my name and organization	x

Questions to Interviewees running a portal/ website

Can you briefly explain the main goals and the value proposition of your website?

The project was launched in 2004 within a European Commission funded project in Europe Innova under FP6 in a preliminary version (cluster mapping) covering 10 EU countries. In 2006 the European Cluster Observatory granted further funding from the European Commission's Directorate-General for Enterprise and Industry to map clusters in the EU-27 plus Iceland, Norway, Switzerland, Turkey and Israel and launch the website. In this preliminary phase the website was a simple website for dissemination of the project outcomes.

In 2012 the Cluster Observatory was separated from the European Cluster Observatory and is now managed by the Center for Strategy and Competitiveness (CSC) at the Stockholm School of Economics.

The Cluster Observatory's website has a twofold objective:

- online/offline networking platform: through the website they provide support to cluster organizations and cluster initiatives across Europe in different industry sectors with the overall goal to bridge the gap between stakeholders, especially universities and venture capitalists.

- online statistical tool: the Observatory carries out statistical analysis on clusters around EU covering multiple industries. The analysis is based on the collection of secondary data that they elaborate and harmonize in order to get comparable data; the observatory developed 2 databases including more than 20,000 organizations. The databases include sensitive data.

The sources used by the Cluster Observatory include Eurostat – from which they get around 20% of the total data - and national statistical offices, around 25 across Europe. The databases developed by the observatory are a unique source of data built ad-hoc for the first time for the initial EU project.

What is your target audience?

The Cluster Observatory mainly targets cluster initiatives and the cluster environment in general, universities, start-ups and venture capitalists

- Which type of access do you offer?

- Open access – most of the services, including the visualization of data and access to the reports are open;

- Registered members (currently around 4,000) – users can register for free in order to receive news on the events organized by the Observatory; registered users can also access the Observatory's online databases and edit/add data;

- What is your offering? (Information, data, match-making services, community services….).

In the launch-phase of the project the plan included the offering of match-making services but then they moved to a platform for information and data. A specialized platform on match-making was developed and it is now linked to the website but run separately.

The initial investments led to the creation of a highly customized online tool that is a valuable resource of their offering.

What is the business model of your website/portal, and what are its main revenue/funding sources? Would you share with us the contribution of the main sources of funding?

Sources of funding	% input in 1 year	Description
Funding from EU / EU project	100%	2006-2007 the website was funded by EU DG enterprise until 2009-2010
Sponsorships/ Partnerships	100%	Currently the website is run privately by the CSC; they developed an exit strategy after the end of the EU funding in order to ensure continuity and sustainability

What are the main categories of cost you face to run your website? Would you be willing to share with us the structure of costs of your website in a typical year? That is, if total costs are 100%, what is the relative weight of the main cost categories? Or could you give us a ranking by relevance?

At the starting phase 100% of the budget was allocated to the start-up of the website that was developed by a subcontractor of the consortium, while in the current phase the maintenance of website takes around 5%. Other relevant costs are the purchase of data from the primary sources and management which take about 50%.

Network for the Market Uptake of ICT for Ageing Well

Identification

Name of interviewee	Miguel Sousa
Title	Project Manager
Organization	INOVA for the Network for the Market Uptake of ICT for Ageing Well
Contact info (email + telephone)	+351 229 397 130/140 miguel.sousa@inovamais.pt
Country and location	Portugal
Date of interview	01/07/2014
Place of interview	Telephone interview
Name of interviewer	Stefania Aguzzi
Does the Interviewee wish to be quoted or prefers to be anonymous? During the interview, please specify which data or content can be quoted, if any	
Yes you can quote my name and organization	x

Questions to Interviewees running a portal/ website

Can you briefly explain the main goals and the value proposition of your website?

The Thematic Network was launched in 2012 and will run until the end of 2014. It is funded European Commission, Information Society and Media Directorate-General, under the ICT Policy Support Programme (ICT PSP) as part of the Competitiveness and Innovation Framework Programme. The aim of the AgeingWell Network is to build and animate a European network focused on improving the quality of life of Elderly People by promoting the market uptake of ICT solutions for Ageing Well. The Thematic Network is composed by 16 founding members and by a network of associate members. All the partners are involved in the development of the planned activities which involve the organisation of events (3 international and 11 national events), but also the creation of an ICT for Ageing knowledge centre, an ICT for Ageing Society Strategic agenda, and the development of guidelines for deployment and sharing of best practice between key knowledge centres.

The project also aims at facilitating the cooperation among stakeholders, they bring together stakeholders from different ICT and Ageing market segments to boost the synergies and promote business relationships between innovative enterprises and the investment community.

Thanks to the contribution from the stakeholders the Network has acquired detailed knowledge on business opportunities at national and local level across EU; through a bottom-up approach they leverage local partners' knowledge from 24 EU MS to identify successful and innovative cases.

What is your target audience?

The Network addresses ICT stakeholders (vendors of AAL technology solutions), investors, venture capitalists, and start-up companies.

Which type of access do you offer?

Selected Community: most of the features on the website are accessible only to registered members of the community. This condition ensures a higher stakeholder engagement, and a more collaborative environment. The registered members are defined as Associate members (distinction from the founding members); they can join for free under the request to actively contribute to the community, provide updated information, and the network gives back to them visibility among relevant actors and insights on business opportunities.

However, the general audience can access without registering the public results of the project, the section informing about the Network, and the news on the events.

What is your offering? (Information, data, match-making services, community services….)

The offering mainly includes the following: match-making services addressed to startups and investors in the field of ICt for ageing; research activities such as the identification and analysis of innovative business case studies across Europe; and the organization of multiple events at national level across Europe.

What is the business model of your website/portal, and what are its main revenue/funding sources? Would you share with us the contribution of the main sources of funding?

Currently the Thematic Network is 100% funded under the EU Programme, until December 2014. The plan is to keep the project (both the network and the website) active after the end of the EU funding; in order to ensure sustainability to the project in the next phase the consortium leading the Network is considering different options of business model, including other EU funding opportunities (e.g. H2020, AALA, etc). The overall goal for the future is to continue enlarging the stakeholder community.

What are the main categories of cost you face to run your website? Would you be willing to share with us the structure of costs of your website in a typical year? That is, if total costs are 100%, what is the relative weight of the main cost categories? Or could you give us a ranking by relevance?

The estimated budget funded by the EU Programme is around 500,000, of this a significant part is addressed to the organization of the network events while the cost for the website is around 25-20% of the original budget.

The resources dedicated to the project include the project manager, and the community manager.

What are your main lessons learned in terms of drivers and barriers, mistakes you would avoid if you started again? What is your advice for a potential AAL online Market Observatory, based on your experience?

The main barrier addresses the enlargement of the Network as it might prove difficult to attract new members so the organization of events represents the opportunity to present the benefits of the network and bring together relevant stakeholders that can be interested in becoming a member and obtain visibility

Opinions on AAL Market Observatory Preliminary Vision and Business Models

Would you be willing to contribute to-participate with such an observatory?

They see potential synergies to collaborate with the Observatory. The stakeholders claim an information need about the ICT and ageing market and both the Network and the Observatory aim at bridging this knowledge gap.

The observatory could be used as a communication tool to disseminate the Network outcomes; the collaboration would create valuable knowledge.

Annex 3 – Detailed tables on desk research

Table 37 Summary of Actual and Potential Demand Documents for Europe

Name of document	Type of document	Brief description of content	Geography	Reference year
"Active and Healthy Ageing" La domotica assistiva e le opportunità di integrazione per l'industria delle costruzioni	Presentation	Demographic data	Italy	2012
Active Ageing e lavoro - Dal dire al fare	Presentation	Labor statistics by age	Italy	2013
Ageing and the use of the internet: CURRENT ENGAGEMENT AND FUTURE NEEDS	Report	Demographic data Data re use of the Internet by seniors	UK	2011
ANALYSIS OF UK LONG TERM CARE MARKET	Report	Data re technology access and use by seniors Demographic data	UK	2012
Assisted living technologies for older and disabled people in 2030	Report	Demographic data Projections of healthcare demand Projections of social care demand	UK	2010
Assisted Living Technology - A market and technology review	Report	Users of assistive technology	UK	2012
Assisted Living UK Capabilities and Opportunities Report	Report	Demographics Current state of AAL by region	UK	2012
Carers and Telecare - Carers UK's report Future Care	Report	Number of telecare users and potential users	UK	2010-2011
Deloitte - Assistive ICT Workshop Presentation	Presentation	Number of people with a disability in the EU Internet use by people with a disability	Europe	2011

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Name of document	Type of document	Brief description of content	Geography	Reference year
		EU 27 estimated assistive ICT use 2010-2016		
Development of a non-invasive CAPactive sensor oral MOUSE interface for the disabled elderly - D1.4: Market Analysis	Report	Demographic data (OECD)	Europe	2011
English Longitudinal Study of Ageing (ELSA)	Report	Demographic data Household structure Housing and income Health data	UK	2012
Finnish Centre for Pensions	Web portal	Official statistics on pensions and persons covered by earnings-related pension insurance	Finland	2014
Future of Ageing Research in Europe: a Road Map	Report	Demographic data	Europe	2011
German AAL Standardization Roadmap (= Ambient Assisted Living)	Report	Demographic data Health data	Germany	2014
GIPdatabank / NL database of assistive devices	Database	Healthcare statistics	Netherlands	2014
Health and Social Care Information Centre	Web portal	National health and social care data	UK	2014
Healthy Ageing Network of Competence - demographic map	Online map	Demographic data	Germany	2014
ICT and Ageing - European Study on Users, Markets and Technologies	Report	Country-by-country description of the 'market', i.e., level of provision, uptake and mainstreaming for each of three main groups of ICT-based service/application in support of independent living and/or homecare for older	Europe	2010

Name of document	Type of document	Brief description of content	Geography	Reference year
		people: •social care (telecare) •home healthcare (home telehealth) •home automation/ assistive technologies (smart homes).		
ICT Assistive Technology Industry in Europe	Presentation	Demographic data	Europe	2007-08
ICT enabled independent living for elderly: A status-quo analysis on products and the research landscape in the field of Ambient Assisted Living (AAL) in EU-27	Report	Demographic data on the ageing society in Europe	Europe	2010
Irish Longitudinal Study on Ageing (TILDA)	Report	Demographic data Household structure Housing and income Health data	Ireland	2014
Long Term Care and Ambient Assisted Living (AAL) in Germany	Report	Demographic data	Germany	2013
Office of National Statistics (UK)	Database	Demographic data	UK	2014
OVER 50s IN A CHANGING IRELAND Economic Circumstances, Health and Well-Being	Report	Socio-demographic and socio-economic data for the elderly	Ireland	2012-2013
Selfcare in the Digital Age	Report	User survey data on selfcare and use of technology	UK	2014
Smart Home: Hope or hype?	Report	Smart Homes penetration data User interest data	Europe	2013
State of Senior Living and the Senior Living Capital Markets 2013	Presentation	Demographic data Financial data Housing data	US	2013

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Name of document	Type of document	Brief description of content	Geography	Reference year
Supporting care recipients with technical assistance systems	Report	Demographic data	Germany	2013
Survey of Health, Ageing and Retirement in Europe (SHARE)	Database	Data on health, socio-economic status and social and family networks	Europe	2011
The 2012 Ageing Report - Economic and budgetary projections for the 27 EU Member States (2010-2060)	Report	Key demographic and macroeconomic data	Europe	2012
The Silver Economy in Southwest Europe	Report	Demographic data	Europe	2014
Turning Demographic Ageing in Europe into Opportunities	Report	Demographic data	Europe	2014
Understanding consumer needs in a changing assisted living market: Insights for Industry	Report	Demographics	UK	2012-2013

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Table 38 Summary of Actual and Potential Demand Documents for the other world regions

Name of document	Type of document	Brief description of content	Geography	Reference year
An Ageing Australia: Preparing for the Future	Database	Demographic data Labour statistics Health expectancy	Australia	2013
Applying ICT & Innovation for the Aged – Enabling better health and enhanced participation to create economic and societal multiplier effects	Presentation	Type and number of users	Global	2012
Australian Longitudinal Study on Ageing (ALSA)	Report	Demographic data Household structure Housing and income Health data	Australia	2010
Canadian Longitudinal Study on Aging	Web portal	Demographic data Financial data Health and fitness data	Canada	2014
Canadian provincial, territorial, and federal government aging policies: A systematic review	Report	Demographic data	Canada	2012
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	Ownership of Health or Monitoring Devices (2010) Interest in Health or Monitoring Devices	US	2010
Health Expenditures by Age and Gender	Web portal	Demographic data Healthcare spending data	US	2002-2010
Living Long & Well in the 21st Century Strategic Directions for Research on Aging	Report	Demographic data	US	2007
Sensor Technology Innovations Enabling Quantified Self -- new era of self-monitoring	Presentation	Adoption potential	Global	2014
Sensors	Journal	Drivers and challenges of adoption	Global	2014

Name of document	Type of document	Brief description of content	Geography	Reference year
Seven Myths of Population Aging: How Companies and Governments can turn the "Silver Economy" into an advantage	Report	Population data Economic impact of aging in the workplace Purchasing power of over 60s Propensity of elderly to use technology	Global	2012
Socio-Economic Impact of Mobile Health	Report	Demographic data by Cluster User profiles	Cluster 1: Norway, Denmark, Sweden, Hungary, Serbia, Montenegro Cluster 2: Thailand, Malaysia, Russia Cluster 3: Bangladesh, Pakistan, India	2012
State of Senior Living and the Senior Living Capital Markets 2013	Presentation	Demographic data Financial data Housing data	US	2013
Technology for Aging in Place: Market Watch 2014	Report	Senior use of technology Senior use of Internet	US	2014
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	Report	Demographic data Data re use of the Internet	US	2011
Thematic Investing: The Silver Dollar -- Longevity Revolution Primer	Report	Birth, death and population statistics Aging statistics Income statistics Incidence of aging related medical conditions and costs	Global	2014

Name of document	Type of document	Brief description of content	Geography	Reference year
Understanding the needs and consequences of the ageing consumer	Report	Population data Life expectancy statistics Over 60s income share data Overs 60s in the workforce Over 60s technology use	Global	2013
US National Institute on Aging	Web portal	Data on ageing	US	2014
Using the United Nations' Madrid indicators to better understand our ageing population.	Web portal	Demographic data	New Zealand	2013
World Health Organization - Ageing and Life Course	Web portal	Data on ageing	Global	2014

Table 39 Summary of Actual and Potential Demand Documents for US and Canada

Name of document	Type of document	Brief description of content	Geography	Reference year
2015 Advancing Canada's next generation of healthcare	Report	Healthcare IT expenditure	Canada	2009
Aging Statistics	Web portal/database	Profile of Older Americans AGing Integrated Database (AGID) Census Data & Population Estimates Projected Future Growth of Older Population Minority Aging Key Indicators of Well-Being	US, Canada, the UK, Germany, France, Italy, Spain, Japan, China, India, Australia and Brazil	2014
Canadian Longitudinal Study on Aging (CLSA)	Online database	Data on demographic and lifestyle/ behaviour measures, social measures, anthropometric measures, psychological measures, socio-economic measures, and health status measures.	Canada	2014
Canadian provincial, territorial, and federal government aging policies: A systematic review	Report	Demographic data	Canada	2012
Caring for BC's Aging Population Improving Health Care for All	Report	Aging population data Acces to care statistics	Canada	2012
Connecting Patients with Providers: Pan-Canadian Study on Remote Patient Monitoring	Report	Patient groups that would be associated with the greatest benefit from being included in	Canada	2014

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Name of document	Type of document	Brief description of content	Geography	Reference year
		an RPM program		
Continuing Care Reporting Systems (CCRS)	Online database	Information on hospital-based continuing care and residential care facilities, with data currently available from seven provinces and territories.	Canada	2014
Deloitte 2012 Survey of U.S. Health Care Consumers: The performance of the health care system and health care reform	Report	Data re use of US healthcare system User/potential user profiles, e.g. willingness to use technology)	US	2012
Discharge Abstract Database (DAD)	Online database	Data on hospital inpatient and day surgery events. More than 3 million records are submitted to the DAD annually.13 Inpatient records submitted to the DAD represent all inpatient discharges in Canada outside of Quebec.i Each record captures a standard clinical, demographic and administrative data set on a patient-specific basis.	Canada	2014
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	Ownership of Health or Monitoring Devices (2010) Interest in Health or	US	2010

Name of document	Type of document	Brief description of content	Geography	Reference year
		Monitoring Devices		
Health Care in Canada 2011: A Focus on Seniors and Aging	Report	Demographics Independent Living Statistics Residential Care Statistics	Canada	2011
Health Expenditures by Age and Gender	Web portal	Demographic data Healthcare spending data	US	2002-2010
Healthy Aging Data Portfolio	Online interactive database and tool	The Healthy Aging Data Portfolio includes data from the following publications: State of Aging and Health in America (SAHA) State of Mental Health and Aging in America (MAHA) Promoting Preventive Services Report (PPS) Enhancing Use of Clinical Preventive Services Among Older Adults (CPS)	US	2014
Home Care Reporting System (HCRS)	Online database	Demographic, clinical, functional and resource utilization information on clients served by publicly funded home care programs in Canada.	Canada	2014
Improving the Health of Canadians: An Introduction to Health in Urban Places	Report	Health statistics related to place and type of residence	Canada	2006

Name of document	Type of document	Brief description of content	Geography	Reference year
Living Long & Well in the 21st Century Strategic Directions for Research on Aging	Report	Demographic data	US	2007
Market Potential for Ambient Assisted Living Technology: The Case of Canada	Report	Demographics	Canada	2009
Medical Device Home Use Initiative	Report	Health care cost data comparing inpatient care to home care for specific conditions	US	2010
National Social Life, Health, and Aging Project (NSHAP)	Report: Longitudinal, population-based study of health and social factors,	Data re the well-being of older, community-dwelling Americans-- examination of the interactions among physical health and illness, medication use, cognitive function, emotional health, sensory function, health behaviors, social connectedness, sexuality, and relationship quality.	US	2011
Seniors Fact Sheet: Health Care	Infographic	Aging population data	Canada	2013
State of Senior Living and the Senior Living Capital Markets 2013	Presentation	Demographic data Financial data Housing data	US	2013
Technology for Injury Prevention in Seniors (TIPS)	Web portal	Arthritis data Osteoporosis data Hip injury data	Canada	2014

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Name of document	Type of document	Brief description of content	Geography	Reference year
		Falls data		
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	Report	Demographic data Data re use of the Internet	US	2011
The National Social Life, Health, and Aging Project: An Introduction	Journal article	Information on physical and cognitive health, health behaviors, medications, and health service utilization	US	2009
US National Institute on Aging	Web portal	Data on ageing	US	2014

Table 40 Summary of Actual and Potential Demand Documents for Asia-Pacific

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
2nd Asia Pacific Silver Economy Business Opportunities Report	report	Ageing Asia	abstract only	According to 2nd Asia-Pacific Silver Economy Business Opportunities Report 2013, Asia-Pacific's silver economy is expected to hit $3 trillion by 2017. The industries affording the brightest prospects for silver hair strategies are healthcare, lifestyle & leisure, pharmaceuticals, insurance and medical equipment.	Singapore, Malaysia, Thailand, Philippines, China, Hong Kong SAR, India, Korea, Japan, Indonesia, Myanmar, Australia, New Zealand, Taiwan, Vietnam	2013
Ageing society and ICT - A new growth industry?	article	International Telecommunication Union	public	Societies are ageing throughout the world and ICT offer responses to this dynamic social change. A good ICT policy will provide the services and tools that match the needs of elderly people. It is especially important to improve their accessibility of e-services as a way of enhancing their daily lives. There are four areas in which ICT can play an essential role for elderly people: infrastructure; lifelines; communications; and enhancement of the richness of daily life.	Japan	2013
Ageing: Impact on Companies in Asia	report	Community Business	public	The report investigates about opportunities for companies in Asia to do more to address the impact of the ageing population on their business, ensuring access to the right talent and the right markets. It highlights some of the characteristics of the ageing population specific to 5 key countries in Asia and explores some of the work-related issues, including the prevalence of age discrimination in Asia. Finally, it recommends initiatives companies in Asia can introduce to	Asia Overview, Japan, Hong Kong, Singapore, China, India	2010

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
				create age diverse workplaces with a particular focus on creating inclusive workplaces for older employees.		
As Silver Economy Booms, Retirement Homes Spring Up	article	CNBC	public	This article reports about the Asian market potential of life-style oriented retirement homes; it presents data from a survey conducted in 2011 by real estate consultancy Jones Lang LaSalle, and the 2011 Asia-Pacific Silver Economy Business Report published by Ageing Asia	Asia	2012
Business opportunities in an ageing China	Slideshare presentation	Silver	public	China is one of the fastest ageing countries on the planet. It faces huge challenges as a result. But there are also business opportunities for the wise. This presentation outlines the market potential, why ageing China is different from other 'ageing' societies and deserves a different approach to business opportunities arising.	China	2014
China National Working Commission on Ageing	website	China National Working Commission on Ageing	public, no material to download	China National Working Commission on Ageing is an advisory organization of the State Council with main responsibilities for developing and monitoring strategies and policies on ageing, and promoting well-being of the elderly at national and global level (initiatives sponsored by UN and other international organizations).	China	2013
Japan Market Report	report	Austrade - Australian Governement	public	The report analyses the current status of the technology market as an opportunity to exploit Australian industry, Japan's ageing population is forging new demand for a wide range of products and services.	Japan	not available

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
Japan's ageing population: From silver to gold	report	The Economist	public	This paper provides insights into implications for Japan of the rapidly ageing population, and outlines some of the challenges that will need to be addressed for Japan to capitalize on the potential opportunities presented by this demographic phenomenon. It is based on interviews with leading experts and senior executives as well as extensive desk research.	Japan	2010
Population Ageing in China - Facts and Figures 2013	report	UNFPA - China	public	The data used in this publication were obtained from official sources, including the 6th National Population Census of the People's Republic of China by the Population Census Office under the State Council. This brochure is developed based on analysis and research conducted by the Institute of Gerontology of Renmin University of China on the China's 6th Population Census in 2010. The National Bureau of Statistics (NBS), UNFPA and UNICEF provided technical and financial support to this work through the joint Data Project.	China	2013
Promoting ICT innovations for the ageing population in Japan	report	Waseda University, Graduate School of Asia-Pacific Studies, Japan for the International Journal of Medical Informatics	public	The paper aims to explore effective measures for the promotion of ICT-enabled innovations for the elderly and people with special needs. The paper reviews current government initiatives in the field of e-health and accessibility that are addressing challenges faced by Japan's rapidly ageing society. It evaluates the results of Japanese government efforts in the promotion of ICT solutions for its older population against the availability of special infrastructure, device interfaces, and services and applications that meet five essential needs of the elderly with regard to quality of life in highly developed countries.	Japan	2012
Riding the ageing Asian Tiger and Dragon - Opportunities for life insurers in the Asian pensions market	report	Ernst&Young	public	The report looks at the factors driving new opportunity for life insurers in the Asian pension markets; examines three of the region's most promising markets that are China, Malaysia and Indonesia; and outlines some of the very different strategies life insurers are either considering, or already implementing, to move into this new area.	Asia: China, Malaysia, Indonesia,	2013

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
Senior living communities emerging as growing market among elderly	article	News18	public	Senior living communities are steadily emerging as a growing market among the elderly who are increasingly looking for a better social lifestyle and security. With 98 million elderly people in India and growing at a rate of 3.8 per cent annually, senior living communities providing assisted living environment for them are emerging as a trend.	India	2014
The Silver Dragon - How to succeed in China's Silver market	article	Spire Journal	public	As their populations aged, Japan and Korea nurtured globally competitive "Silver industries" and technologies, from mobile phones to telemedicine. This article answers to the following questions: What may be the greatest market opportunity yet for these industries now beckons – China, the most rapidly aging large economy today. How will China's Silver market change the game for marketers? What can be done to win in this arena?	China	2013
The Silver Lining: Opportunities in Aging Asia	report	Government of Canada	public	The aging of populations in several parts of Asia is normally seen as a profound economic challenge for these societies and their governments. However, this demographic shift is catalyzing a new way of thinking about opportunities in different areas, and the rights of the elderly. Identifying these opportunities will be just as important as addressing the challenges. These opportunities will also extend to non-Asian countries, especially to those with firms that produce product lines that cater to elderly consumers and their families. It will also include opportunities to offer services, especially from countries with welfare, social security and elderly rights systems that can be 'exported' and then adjusted to Asia's varying social and economic circumstances.	Asia	2014

Table 41 Summary of Market Value and Size Documents for Europe

Name of document	Type of document	Brief description of content	Geography	Reference year
"Active and Healthy Ageing" La domotica assistiva e le opportunità di integrazione per l'industria delle costruzioni	Presentation	Market overview at national level Map of national AAL initiatives	Italy	2012
12TH AFIPA BAROMETER ON SELFCARE PRODUCTS: AN IMBALANCED AND CONTRASTED SITUATION FOR PRODUCTS IN THE SELFCARE MARKET	Press release	Sales of selfcare devices by pharmacies in France	France	2013
Ageing and the use of the internet: CURRENT ENGAGEMENT AND FUTURE NEEDS	Report	Current state of AAL by region	UK	2011
ALT Market in the UK - AKTIVE Market Report	Report	Assisted living technologies delivery chain Barriers and challenges to widespread ALT adoption by older people Classification of demand side players Definition of buyers versus end users	UK	2013
ANALYSIS OF UK LONG TERM CARE MARKET	Report	Forecast for long term care market in UK by residential and non-residential Comparison of UK long term care market to global markets	UK	2012
Assisted living in Europe technology and market trends 2010	Presentation	Geographic analysis of market by revenue	Europe	2009
Assisted living technologies for older and disabled people in 2030	Report	State of the ALS market, take-up enablers State of the telehealth market	UK	2010

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Name of document	Type of document	Brief description of content	Geography	Reference year
		State of the telecare market		
Assisted Living Technology - A market and technology review	Report	Classification of ALT technologies Current and projected market size Markets for assistive technology	UK	2012
Best Practices: Remote Patient Monitoring Projects in Central and Eastern Europe	Report	Current and projected remote patient monitoring market size and value	Central and Eastern Europe	2012
BRAID Bridging Research in Ageing and ICT Development D1.3 Technology & Market Baseline & Trends	Report	Classification of ICT relevant to aging Assessment of current state of ICT in ageing Penetration of social alarms in the EU by country Taxonomy	Europe	2011
Carers and Telecare - Carers UK's report Future Care	Report	Type of telecare used by carers Case studies -- benefits and challenges to patients	UK	2010-2011
Deloitte - Assistive ICT Workshop Presentation	Presentation	EU Service Delivery models EU MS Government Support	Europe	2011
Development of a non-invasive CAPactive sensor oral MOUSE interface for the disabled elderly - D1.4: Market Analysis	Report	Classification of interface devices SWOT analysis of interface devices	Europe	2011

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Name of document	Type of document	Brief description of content	Geography	Reference year
Equipment for older and disabled people: an analysis of the market	Report	Estimates of market size Insights into the complexity of the market and supply channels	UK	2010
European Market for Remote Patient Monitoring Applications	Abstract	Remote patient monitoring market size by revenue	Europe	2011
European Medical Technology Industry in Figures	Presentation	Classification of medical technology (not specific to AAL) Worldwide medical technology (not specific to AAL) market by revenue and type of application, specific to AAL); by market growth rate (based on manufacturers prices) European trade statistics for medical technology by country	Global Europe	2012
European Smart Homes and Assisted Living Market (2010 – 2015)	Report	Categorization of smart homes market on the basis of applications and countries	Europe	2011
Growing the Assisted Living market using managed service framework supply chains	Report	Assisted Living market	UK	2013
Healthy Ageing Network of Competence	Web portal	Information on value chains	Germany - Netherlands	2014
How Does Europe Do It? Balancing Adoption and Affordability of Medical Devices	Presentation	Spending on medical devices	Germany	2007

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Name of document	Type of document	Brief description of content	Geography	Reference year
ICT Assistive Technology Industry in Europe	Presentation	Assistive technology delivery models by EU country	Europe	2007-08
ICT enabled independent living for elderly: A status-quo analysis on products and the research landscape in the field of Ambient Assisted Living (AAL) in EU-27	Report	Number of AAL public, private and mixed organisations working in the field of AAL by country Range and volume of products	Europe	2010
Living in Old Age in Europe - Current Developments and Challenges	Report	Living/Residential situation of the elderly in the EU	Europe	2012
Market Developments – Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth	Report	Market size date for the Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth Markets	Europe	2012
MarketsandMarkets: European Smart Homes and Assisted Living - Advanced Technologies and Global Market Worth €152.2 million	Report	Smart home and assisted living market size and revenue	Europe	2010-2015
Mobility aids - An Office of Fair Trading market study	Report	Overview of the Mobility Aids sector Competitive analysis	UK	2011
Research Activities in Ambient Assisted Living (AAL) @ it	Presentation	Classification of AAL applications	Italy	2012
Smart Home: Hope or hype?	Report	Smart Homes market data	Europe	2013
Supporting care recipients with technical assistance systems	Report	Classification of support	Germany	2013

Name of document	Type of document	Brief description of content	Geography	Reference year
		systems by type of use Quality and suitability assessment of available products in each category		
The 2012 Ageing Report - Economic and budgetary projections for the 27 EU Member States (2010-2060)	Report	Pension expenditure projections Health care expenditures Long-term care expenditures	Europe	2012
Turning Demographic Ageing in Europe into Opportunities	Report	Overview of the on-going projects, innovative EU initiatives, key policy documents and new funding programmes for the new financial period 2014-2020	Europe	2014
UK database of assistive devices	Web portal	Product classification and comparison	UK	2014
Understanding consumer needs in a changing assisted living market: Insights for Industry	Report	Market size by category Business models Consumer considerations Buying behaviours	UK	2012-2013

Table 42 Summary of Market Value and Size Documents for the other world regions

Name of document	Type of document	Brief description of content	Geography	Reference year
Ambient Assisted Living Healthcare Frameworks, Platforms, Standards, and Quality Attributes	Journal article	Overview of current usage and real world deployment of specific AAL systems and platforms.	Global	2014
Applying ICT & Innovation for the Aged – Enabling better health and enhanced participation to create economic and societal multiplier effects	Presentation	Takeup by type of solution	Global	2012
Case studies and reports focused on issues associated with home care	Web portal	Case studies on innovative practices in home care	Canada	2014
Connected Health Opportunities for Service Providers	Report	Consumer interest and demand for connected health solutions	US	2013
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	US Aging in Place Market size Connected care market size	US	2010
Expanding Opportunities for Smart Textiles	Presentation	Revenue projections for smart textile market	Global	2013
Health Management and Monitoring in the World's Largest Market	Report	Market size and potential for healthcare technologies including smart devices for wellness, home care and community care	US	2014
Home Accessibility as an Alternative to Retirement Community & Assisted Living	Presentation	Comparison of costs (living at home vs assisted living facility)	US	2010
ICAA names top 10 trends in active aging	Press release	Insights and predictions into	Global	2011

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Name of document	Type of document	Brief description of content	Geography	Reference year
		markets and associated growth driven by an aging population		
IDC's Worldwide Wearable Computing Devices Taxonomy, 2013 #243964	Report	Classification of wearable technologies	Global	2013
ISA-Platform: "Integrated Service Areas"	Web portal	M-health apps classification Economic benefits of m-health adoption	Denmark Germany Japan Netherlands Sweden Switzerland US	2013
Perspective: mHealth in Canada — Smartphones and Apps Bring Better Healthcare to Your Fingertips	Report	Survey data re the Canadian healthcare mobile device market	Canada	2013
Rise of Connected Living and What it Means for ICT	Presentation	Market drivers Adoption potential Global Connected Living Market Size in 2020	Global	2014
Risking Australia's telehealth future	News article	Data on size of Australian telehealth monitoring market Data on size of Asian telehealth monitoring market	Australia Asia	2013
Self-Care Medical Devices Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019	Abstract	Self-Care Medical Devices Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019	Global	2013

Name of document	Type of document	Brief description of content	Geography	Reference year
Socio-Economic Impact of Mobile Health	Report	Data on mobile subscribers	Cluster 1: Norway, Denmark, Sweden, Hungary, Serbia, Montenegro Cluster 2: Thailand, Malaysia, Russia Cluster 3: Bangladesh, Pakistan, India	2012
Technology for Aging in Place: Market Watch 2014	Report	Aging in place technology categories Market size estimates	US	2014
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	Report	Type of health and wellness technologies used Type of communications technologies used Type of safety and security technologies used	US	2011
Thematic Investing: The Silver Dollar -- Longevity Revolution Primer	Report	Senior living industry revenue expectations	Global	2014
Top 20 Wearable Technology Companies 2014	Report	Market size data	Global	2014
Vision of Smart Home: The Role of Mobile in the Home of the Future	Report	Home medical devices revenue	Global	2011-2016
Wearable Computing: New Market Opportunities and Challenges	Presentation	Market forecast data	US	2012-2018
Wearable Technology – Market Assessment	Presentation	Revenue and shipments	Global	2013
Worldwide Wearable Computing Device 2014-2018 Forecast and Analysis #247318	Report	Five-year forecast for the	Global	2014

| Name of document	Type of document	Brief description of content	Geography	Reference year
		worldwide wearable computing devices market by product category.		
Worldwide Wearable Computing Market Gains Momentum with Shipments Reaching 19.2 Million in 2014 and Climbing to Nearly 112 Million in 2018, Says IDC	Press release	Five-year forecast for the worldwide wearable computing devices market by product category.	Global	2014

Table 43 Summary of Market Value and Size Documents for US and Canada

Name of document	Type of document	Brief description of content	Geography	Reference year
2013 Canadian Telehealth Report	Report	Data on current RPM takeup in Canada Classification of RPM	Canada	2013
Caring for BC's Aging Population Improving Health Care for All	Report	Market size and potential for healthcare technologies including smart devices for wellness, home care and community care	Canada	2012
Case studies and reports focused on issues associated with home care	Web portal	US Aging in Place Market size Connected care market size	Canada	2014
Connected Health Opportunities for Service Providers	Report	Comparison of costs (living at home vs assisted living facility)	US	2013
Connecting Patients with Providers: Pan-Canadian Study on Remote Patient Monitoring	Report	Market potential	Canada	2014
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	Case studies on innovative practices in home care	US	2010
Health Management and Monitoring in the World's Largest Market	Report	Market forecast data	US	2014
Home Accessibility as an Alternative to Retirement Community & Assisted Living	Presentation	Market, competitive landscape, and trends for the two remote patient monitoring market segments: implantable remote patient monitoring and external remote patient monitoring.	US	2010
Home Healthcare Services	Blog	Type of health and wellness technologies used Type of communications technologies used Type of safety and security technologies used	US	2012
Market Potential for Ambient Assisted Living Technology: The Case of Canada	Report	Current state of Digital Health deployment in Canadian healthcare organizations	Canada	2009

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Perspective: mHealth in Canada — Smartphones and Apps Bring Better Healthcare to Your Fingertips	**Report**	**Consumer interest and demand for connected health solutions**	**Canada**	**2013**
Remote Patient Monitoring Market to 2019 – Potential to Reduce Healthcare Cost Burden and Improve Quality of Care to Drive Future Growth	**Report**	**Provincial healthcare spending**	**US, Canada, the UK, Germany, France, Italy, Spain, Japan, China, India, Australia and Brazil**	**2011-2019**
Success of Telehealth in Canada	**Report**	**Data about market size for various industries**	**Canada**	**2012**
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	**Report**	**Survey data re the Canadian healthcare mobile device market**	**US**	**2011**
Trends in Telehealth	**Report**	**Use of Home Telehealth Monitoring Devices by Province and purpose (disease)** **Use of Home Telehealth Devices by Province and by type of data captured** **Data re use of medical peripherals to support telehealth consultations (by province)** **Data re use of desktop and mobile conferencing (by type of interaction)** **Data re use of electronic scheduling to support telehealth**	**US**	**2014**
Wearable Computing: New Market Opportunities and Challenges	**Presentation**	**Classification of telehealth products**	**US**	**2012-2018**
2013 Canadian Telehealth Report	**Report**	**Data on current RPM takeup in Canada** **Classification of RPM**	**Canada**	**2013**
Caring for BC's Aging Population Improving Health Care for All	**Report**	**Market size and potential for healthcare technologies including smart devices for wellness, home care and community care**	**Canada**	**2012**

Case studies and reports focused on issues associated with home care	Web portal	US Aging in Place Market size Connected care market size	Canada	2014
Connected Health Opportunities for Service Providers	Report	Comparison of costs (living at home vs assisted living facility)	US	2013
Connecting Patients with Providers: Pan-Canadian Study on Remote Patient Monitoring	Report	Market potential	Canada	2014
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	Case studies on innovative practices in home care	US	2010
Health Management and Monitoring in the World's Largest Market	Report	Market forecast data	US	2014
Home Accessibility as an Alternative to Retirement Community & Assisted Living	Presentation	Market, competitive landscape, and trends for the two remote patient monitoring market segments: implantable remote patient monitoring and external remote patient monitoring.	US	2010
Home Healthcare Services	Blog	Type of health and wellness technologies used Type of communications technologies used Type of safety and security technologies used	US	2012

Table 44 Summary of Market Value and Size Documents for Asia-Pacific

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
2nd Asia Pacific Silver Economy Business Opportunities Report	report	Ageing Asia	abstract only is public	According to 2nd Asia-Pacific Silver Economy Business Opportunities Report 2013, Asia-Pacific's silver economy is expected to hit $3 trillion by 2017. The industries affording the brightest prospects for silver hair strategies are healthcare, lifestyle & leisure, pharmaceuticals, insurance and medical equipment.	Singapore, Malaysia, Thailand, Philippines, China, Hong Kong, India, Korea, Japan, Indonesia, Myanmar, Australia, New Zealand, Taiwan, Vietnam	2013
As Silver Economy Booms, Retirement Homes Spring Up	article	CNBC	public	This article reports about the Asian market potential of life-style oriented retirement homes; it presents data from a survey conducted in 2011 by real estate consultancy Jones Lang LaSalle, and the 2011 Asia-Pacific Silver Economy Business Report published by Ageing Asia	Asia	2012
ICT Accessibility Solutions for Japan's Ageing / Disability in Societies	presentation	Dr. Toshio Obi Professor, Waseda University, Japan	public	The presentation provides an overview of the available ICT application sectors for elderly and people with disabilities and egovernment services designed for ageing people	Japan	2012
Japan Market Report	report	Austrade - Australian Governement	public	The report analyses the current status of the technology market as an opportunity to exploit Australian industry, Japan's ageing population is forging new demand for a wide range of products and services.	Japan	not available
Promoting ICT innovations for the ageing population in Japan	report	Waseda University, Graduate School of Asia-Pacific Studies, Japan for	public	The paper aims to explore effective measures for the promotion of ICT-enabled innovations for the elderly and people with special needs. The paper reviews current government initiatives in the field of e-health and accessibility that are addressing challenges faced by Japan's	Japan	2012

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
		the International Journal of Medical Informatics		rapidly ageing society. It evaluates the results of Japanese government efforts in the promotion of ICT solutions for its older population against the availability of special infrastructure, device interfaces, and services and applications that meet five essential needs of the elderly with regard to quality of life in highly developed countries.		
Riding the ageing Asian Tiger and Dragon - Opportunities for life insurers in the Asian pensions market	report	Ernst&Young	public	The report looks at the factors driving new opportunity for life insurers in the Asian pension markets; examines three of the region's most promising markets that are China, Malaysia and Indonesia; and outlines some of the very different strategies life insurers are either considering, or already implementing, to move into this new area.	Asia: China, Malaysia, Indonesia,	2013
Senior living communities emerging as growing market among elderly	article	News18	public	Senior living communities are steadily emerging as a growing market among the elderly who are increasingly looking for a better social lifestyle and security. With 98 million elderly people in India and growing at a rate of 3.8 per cent annually, senior living communities providing assisted living environment for them are emerging as a trend.	India	2014
The Silver Lining: Opportunities in Aging Asia	report	Government of Canada	public	The aging of populations in several parts of Asia is normally seen as a profound economic challenge for these societies and their governments. However, this demographic shift is catalyzing a new way of thinking about opportunities in areas such as healthcare, lifestyle management, work environments, adult education, and the rights of the elderly. Identifying these opportunities will be just as important as addressing the challenges. These opportunities will also extend to non-Asian countries, especially to those with firms that produce product lines that	Asia	2014

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
				cater to elderly consumers and their families. It will also include opportunities to offer services, especially from countries with welfare, social security and elderly rights systems that can be 'exported' and then adjusted to Asia's varying social and economic circumstances.		

Table 45 Summary of Market Trends and Drivers of Evolution Documents for Europe

Name of document	Type of document	Brief description of content	Geography	Reference year
"Active and Healthy Ageing" La domotica assistiva e le opportunità di integrazione per l'industria delle costruzioni	Presentation	Use of sensors to improve the home enviroment for AAL	Italy	2012
Accessible Technology Ecosystem and Why it is Critical	Presentation	Proposed framework for an elderly entertainment support system	Europe	2009
Active Ageing e lavoro - Dal dire al fare	Presentation	Market drivers Market dynamics Impact of AAL on ALT market Key ALT market trends	Italy	2013
Ageing and the use of the internet: CURRENT ENGAGEMENT AND FUTURE NEEDS	Report	List of research projects	UK	2011
ALT Market in the UK - AKTIVE Market Report	Report	Drivers and barriers to market growth AT structure and players AT industry drivers	UK	2013
Assisted living in Europe technology and market trends 2010	Presentation	mHealth applications Call to action: Realize remote monitoring opportunity	Europe	2009
Assisted living technologies for older and disabled people in 2030	Report	Smart home and assisted living market restraints and drivers Opportunity analysis for SMEs	UK	2010
Assisted Living Technology - A market and technology review	Report	Ecosystem for smart end-to end remote health monitoring describing the requisite components	UK	2012
BRAID Bridging Research in Ageing and ICT Development D1.3 Technology & Market Baseline & Trends	Report	Insights into engagement with theinternet by older people	Europe	2011
Business Models to Support New Approaches to Assisted Living in a Consumer Market	Presentation	Business models Financing options	UK	2014

Name of document	Type of document	Brief description of content	Geography	Reference year
		Value chain characeeristics		
Catalogo de productos de apoyo/Spanish database of assistive devices	Database	Design guide for new and refurbished homes for AAL New and future technologies in home adaptation (or new build) for AAL	Spain	2014
European Market for Remote Patient Monitoring Applications	Abstract	Roadmap for implementing interoperability standards for electromobility devices	Europe	2011
European Smart Homes and Assisted Living Market (2010 – 2015)	Report	Senior Housing Market Composition and Size	Europe	2011
Future of Ageing Research in Europe: a Road Map	Report	Areas driving the development of wearable technology	Europe	2011
German Standardization Roadmap for Electromobility – Version 2.0A	Report	Senior living continuum of care Cost of care data Home and community services cost data Accountable care organizations landscape Technology game changers	Germany (with some international data)	2013
Growing the Assisted Living market using managed service framework supply chains	Report	Best practices National senior citizen policy and the state of development of integrated service area concepts	UK	2013
GUIDE FOR ASSISTED LIVING: Towards LifeHome 21	Report	European level Initiatives, Research and Innovation Programmes and Funds Regional and National Programs for the Ageing society	UK	2011
Healthy Ageing Network of Competence	Web portal	Value of mobile technologies	Germany - Netherlands	2014
ICT Assistive Technology Industry in Europe	Presentation	Expectations for key ICT in aging technologies RDT Roadmap Summary of ICT in ageing solutions, baselines and trends for technology and market	Europe	2007-08
ICT enabled independent living for elderly: A status-quo analysis on products and	Report	Maturity of assistive technologies to support people	Europe	2010

Name of document	Type of document	Brief description of content	Geography	Reference year
the research landscape in the field of Ambient Assisted Living (AAL) in EU-27		with dementia New technological developments and implications for people with dementia		
Living Lab Denmark	Web portal	Scenarios for 2030 Requirements of older people Impact of digital inclusion	Denmark	2014
Long Term Care and Ambient Assisted Living (AAL) in Germany	Report	Overview of the market Influence of megatrends on the market Megatrend influence Technology development and adoption Key application segments Market drivers	Germany	2013
Market Developments – Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth	Report	Value of mobile technologies	Europe	2012
MarketsandMarkets: European Smart Homes and Assisted Living - Advanced Technologies and Global Market Worth €152.2 million	Report	Technology roadmap for smart textiles	Europe	2010-2015
Research Activities in Ambient Assisted Living (AAL) @ it	Presentation	Trends and opportunities	Italy	2012
Study on business and financial models related to ICT for Ageing Well	Report	Business opportunities offered by an aging population	Europe	2013
Telecare Services Association	Web portal	Analysis of the market for telemedicine and telehealth services in the US -- device vendors	UK	2014
The "Open Platform" Track in EU for Achieving AAL Market-Breakthrough	Presentation	Market opportunities Critical success factors	Europe	2013
The ageing marketplace: how some companies are successfully addressing the needs of the older consumer, whilst others are struggling to access this expanding market.	Report	Challenges of innovation	UK	2012
The Silver Economy in Southwest Europe	Report	Revenue forecasts for Smart Homes market	Europe	2014

Name of document	Type of document	Brief description of content	Geography	Reference year
		Revenue forecasts for Smart Homes applications		
Towards Influencing Factors on Business Models of Ambient Assisted Living Systems: An Analysis of the German Health Care Markets	Report	Catalogue of companies and products in the area of assistive technologies	Germany	2013
Turning Demographic Ageing in Europe into Opportunities	Report	Guidance for consumers	Europe	2014
Wearable Technology – Market Assessment	Presentation	Potential future AT ecosystem Technological trends	Global	2013

Table 46 Summary of Market Trends and Drivers of Evolution Documents for the other world regions

Name of document	Type of document	Brief description of content	Geography	Reference year
"SmartMonitor"— An Intelligent Security System for the Protection of Individuals and Small Properties with the Possibility of Home Automation	Journal article	Areas driving the development of wearable technology	Global	2014
Ambient Assisted Living Healthcare Frameworks, Platforms, Standards, and Quality Attributes	Journal article	Technology trends Social housing trends	Global	2014
Australian Longitudinal Study on Ageing (ALSA)	Report	Proposed concept of a personalized cognitive rehabilitation system in a naturalistic setting.	Australia	2010
Beyond Trade-offs: **How Medical Device Manufacturers can Balance Innovation, Quality and Compliance While Improving Profit**	Report	Insights into relationship between working and "active aging"	US	2012
Business Strategy: Monetizing Telemedicine — Consumer Device Opportunities	Report	Barriers and drivers to eALT adoption	US	2012
Expanding Opportunities for Smart Textiles	Presentation	Trends in the Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth Markets	Global	2013
Framework for a Context-Aware Elderly Entertainment Support System	Journal article	Remote patient monitoring market evolution Gaps in the market Growth drivers and hindrances	Global	2014
ISA-Platform: "Integrated Service Areas"	Web portal	Case examples	Denmark Germany Japan Netherlands Sweden Switzerland US	2013
Literature review: the cost effectiveness of assistive technology in	Report	Overview of the wearable device market	Global	2013

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Name of document	Type of document	Brief description of content	Geography	Reference year
supporting people with dementia				
Mobile Device System for Early Warning of ECG Anomalies	Journal Article	Results of new product tests in the user environment	Global	2014
Patient Access to Medical Devices — A Comparison of U.S. and European Review Processes	Journal article	Proposed solution in real-time monitoring of ECG signals using mobile technology	Europe US	2012
Preliminary Evaluation of a Personal Healthcare System Prototype for Cognitive eRehabilitation in a Living Assistance Domain	Journal article	Purchasing power of the silver economy Market segmentation by silver economy agents	Global	2014
Rise of Connected Living and What it Means for ICT	Presentation	Current and future assistive technology market drivers	Global	2014
Seniors Housing Market Overview	Presentation	Survey of the current state-of-the-art in AAL frameworks, architectures, technologies and standards	US	2013
Sensor Technology Innovations Enabling Quantified Self -- new era of self-monitoring	Presentation	Policies for supporting an aging society	Global	2014
Socio-Economic Impact of Mobile Health	Report	Overview of the World Market for Wearable Technology Market Structure Market Drivers	Cluster 1: Norway, Denmark, Sweden, Hungary, Serbia, Montenegro Cluster 2: Thailand, Malaysia, Russia Cluster 3: Bangladesh, Pakistan, India	2012
State of Senior Living and the Senior Living Capital Markets 2013	Presentation	Technological fields where research activities are growing	US	2013
Technology Selection: A Technology Framework for End-to-End Remote	Report	Expectations for rate of new medical device product introduction	Global	2013

Name of document	Type of document	Brief description of content	Geography	Reference year
Health Monitoring		US FDA Innovation Pathway		
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	Report	Assisted Living scenarios	US	2011
Thematic Investing: The Silver Dollar -- Longevity Revolution Primer	Report	Technology market opportunities driven by medical conditions	Global	2014
Top 20 Wearable Technology Companies 2014	Report	Policy implications of an ageing society	Global	2014
Understanding the needs and consequences of the ageing consumer	Report	Impact of aging society on the Consumer Goods Industry	Global	2013
US National Institute on Aging	Web portal	Interoperability standards REAAL Model and architecture Realization platform Operational support needed for AAL	US	2014
Using the United Nations' Madrid indicators to better understand our ageing population.	Web portal	Premarket Approval and Reimbursement Processes. Comparison of Time to Market Access for Five Innovative Devices in France, Italy, and the United States.	New Zealand	2013
Vision of Smart Home: The Role of Mobile in the Home of the Future	Report	Overview of the World Market for Wearable Technology Market Structure Market Drivers	Global	2011-2016
Wearable Computing: New Market Opportunities and Challenges	Presentation	Barriers to sustainability and replicability Recommendations for large-scale exploitation Succesful business models in the EU eldercare system	US	2012-2018
Wearable Technology – Market Assessment	Presentation	Potential future AT ecosystem Technological trends	Global	2013

Table 47 Summary of Market Trends and Drivers of Evolution Documents for US and Canada

Name of document	Type of document	Brief description of content	Geography	Reference year
2013 Canadian Telehealth Report	Report	Future priorities for Canada's telehealth program -- expand/upgrade infrastructure, increase use of digital stethoscopes, cameras and other devices, expand use of desktop videoconferencing in clinical areas, e.g. audiology, dermatology, eating disorders, gastroenterology and to provide education in the areas of general health, mental wellbeing, elder health and wellness, rheumatology and stroke	Canada	2013
2015 Advancing Canada's next generation of healthcare	Report	Roadmap for Canada's healthcare future Key priority -- Facilitate improvements in self-care, e.g., Create patient portals with access to EHR and other basic information and self-care tools	Canada	2009
Assisted Living State Regulatory Review 2011	Report	Summary of regulation of assisted living in each state and the District of Columbia		2011
Beyond Trade-offs: How Medical Device Manufacturers can Balance Innovation, Quality and Compliance While Improving Profit	Report	Expectations for rate of new medical device product introduction US FDA Innovation Pathway	US	2012
Business Strategy: Monetizing Telemedicine — Consumer Device Opportunities	Report	Analysis of the market for telemedicine and telehealth services in the US -- device vendors	US	2012
Connecting Patients with Providers: Pan-Canadian Study on Remote Patient Monitoring	Report	Potential for RPM implementation across Canada Emerging RPM solutions and programs	Canada	2014
Market Potential for Ambient Assisted Living Technology: The Case of Canada	Report	Canadian Federal and Provincial Policies Market drivers and barriers	Canada	2009
Medical Device Home Use Initiative	Report	Reported issues with use of devices	US	2010

Name of document	Type of document	Brief description of content	Geography	Reference year
		Need for tighter guidelines		
Opportunities for Action A Pan-Canadian Digital Health Strategic Plan	Report	Key priorities -- Bring care closer to home through use of mobile patient monitoring solutions; Improve chronic disease management with telehealth		
Seniors Housing Market Overview	Presentation	Senior Housing Market Composition and Size	US	2013
State of Senior Living and the Senior Living Capital Markets 2013	Presentation	Senior living continuum of care Cost of care data Home and community services cost data Accountable care organizations landscape Technology game changers	US	2013
Technology Survey Age 65 to 100: Extending Technology Past the Boomers	Report	Advice for technology providers	US	2011
Trends in Telehealth	Report	Telehealth market drivers and barriers	US	2014
US National Institute on Aging	Web portal	Guidance for consumers	US	2014
Wearable Computing: New Market Opportunities and Challenges	Presentation	Areas driving the development of wearable technology	US	2012-2018

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Table 48 Summary of Market Trends and Drivers of Evolution Documents for Asia-Pacific

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
2nd Asia Pacific Silver Economy Business Opportunities Report	report	AgeingAsia	abstract only is public	According to 2nd Asia-Pacific Silver Economy Business Opportunities Report 2013 conducted by Ageing Asia Pte, Asia-Pacific's silver economy is expected to hit $3 trillion by 2017. The industries affording the brightest prospects for silver hair strategies are healthcare, lifestyle & leisure, pharmaceuticals, insurance and medical equipment.	15 Asia Pacific countries – Singapore, Malaysia, Thailand, Philippines, China, Hong Kong SAR, India, Korea, Japan, Indonesia, Myanmar, Australia, New Zealand, Taiwan, Vietnam	2013
Ageing Asia Alliance Journal	brochure	AgeingAsia	public	The Journal is a quarterly publication by Ageing Asia Pte Ltd, focusing on key market trends observed in Asia-Pacific's silver economy, as well as opportunities and challenges	Asia: Japan, Malaysia, Singapore	2012

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
Ageing society and ICT - A new growth industry?	article	International Telecommunication Union	public	Societies are ageing throughout the world, and information and communication technologies (ICT) offer responses to this dynamic social change. A good ICT policy will provide the services and tools that match the needs of elderly people. It is especially important to improve their accessibility of e-services as a way of enhancing their daily lives. There are four areas in which ICT can play an essential role for elderly people: infrastructure; lifelines; communications; and enhancement of the richness of daily life. In Japan, for example, older people particularly appreciate applications that offer them access to social welfare services and regional activities. They also benefit from access to educational opportunities, for example through Internet classrooms.	Japan	2013
As Silver Economy Booms, Retirement Homes Spring Up	article	CNBC	public	This article reports about the Asian market potential of life-style oriented retirement homes; it presents data from a survey conducted in 2011 by real estate consultancy Jones Lang LaSalle, and the 2011 Asia-Pacific Silver Economy Business Report published by Ageing Asia	Asia	2012
Business opportunities in an ageing China	Slideshare presentation	Silver	public	China is one of the fastest ageing countries on the planet. It faces huge challenges as a result. But there are also business opportunities for the wise. This presentation outlines the market potential, why ageing China is different from other 'ageing' societies and deserves a different approach to business opportunities arising.	China	2014
Japan's ageing population: From silver to gold	report	The Economist	public	This paper provides insights into implications for Japan of the rapidly ageing population, and outlines some of the challenges that will need to be addressed for Japan to capitalize on the potential opportunities presented by this demographic phenomenon. It is based on interviews with leading experts and senior executives as well as extensive desk research.	Japan	2010
Opportunities in APAC's US$3 Trillion ageing market	slideshare presentation	AgeingAsia	public	Reporting about Asian key stakeholders' view on the future and opportunities of ageing business opportunities in Asia Pacific	Asia	2013

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
Promoting ICT innovations for the ageing population in Japan	report	Waseda University, Graduate School of Asia-Pacific Studies, Japan. International Journal of Medical Informatics (Impact Factor: 2.06). 06/2012; DOI: 10.1016/j.ijmedinf.2012.05.004	public	The paper aims to explore effective measures and strategies for the promotion of ICT-enabled innovations for the elderly and people with special needs. he paper begins by reviewing current government initiatives in the field of e-health and accessibility that are addressing challenges faced by Japan's rapidly ageing society. It then evaluates the results of Japanese government efforts in the promotion of ICT solutions for its older population against the availability of special infrastructure, device interfaces, and services and applications that meet five essential needs of the elderly with regard to quality of life in highly developed countries.	Japan	2012
The assistive device market booms as China lives longer and better	article	HKTDC	public	the article reports about the growth of the domestic assistive device market thanks to China's aging demographic, with innovation being rewarded by an increased willingness to spend by the elderly and being driven by competition with high-tech imports. -	China	2014
The Silver Dragon - How to succeed in China's Silver market	article	Spire Journal	public	As their populations aged, Japan and Korea nurtured globally competitive "Silver industries" and technologies, from mobile phones to telemedicine. What may be the greatest market opportunity yet for these industries now beckons – China, the most rapidly aging large economy today. How will China's Silver market change the game for marketers? What can be done to win in this arena?	China	2013

Name of document	Type of document	Primary Source of the document	Level of access	Brief description of content	Geography	Reference year
The Silver Lining: Opportunities in Aging Asia	report	Government of Canada	public	The aging of populations in several parts of Asia is normally seen as a profound economic challenge for these societies and their governments. However, this demographic shift is catalyzing a new way of thinking about opportunities in areas such as healthcare, lifestyle management, work environments, adult education, and the rights of the elderly. Identifying these opportunities will be just as important as addressing the challenges. These opportunities will also extend to non-Asian countries, especially to those with firms that produce product lines that cater to elderly consumers and their families. It will also include opportunities to offer services, especially from countries with welfare, social security and elderly rights systems that can be 'exported' and then adjusted to Asia's varying social and economic circumstances.	Asia	2014

Table 49 Summary of Interoperability and Standards Documents for Europe

Name of document	Type of document	Brief description of content	Geography	Reference year
ALIP Assisted Living Innovation Platform	Web portal	Insights into information needed by different industry sectors	UK	2014
Ambient Assisted Living Association -AAL-:Partnerships for Social Innovation in Europe	Session summary	Role of interoperability standards and platforms Obstacles to adoption of standards by technology providers	Europe	2011
Assisted Living Innovation Platform-Dallas and interoperability	Presentation	NHS Interoperability Toolkit Case study of a community AAL interoperability project	UK	2012
Assisted living technologies for older and disabled people in 2030	Report	Standards and networking strategies	UK	2010
German AAL Standardization Roadmap (= Ambient Assisted Living)	Report	AAL System model German AAL Standardization roadmap classification of standards	Germany	2014
German Standardization Roadmap for Electromobility – Version 2.0A	Report	Interoperability standards for Electromobility Devices Structure of the international standardization landscape	Germany (with some international data)	2013
GUIDE FOR ASSISTED LIVING: Towards LifeHome 21	Report	Housing standards matrix Requirements definition for home refurbishments for AAL Ergonomic data Connectivity requirements	UK	2011
How Standardisation can support the silver economy: Wiser standards for an ageing world	Report	Need for accommodation regulatory standards, social alarm standards, and accessibility standards	Europe	2014
Smart Home: Hope or hype?	Report	Home network technological ecosystem	Europe	2013
Telecare Services Association	Web portal	Industry standards	UK	2014

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Table 50 Summary of Interoperability and Standards Documents for the other world regions

Name of document	Type of document	Brief description of content	Geography	Reference year
"SmartMonitor"— An Intelligent Security System for the Protection of Individuals and Small Properties with the Possibility of Home Automation	Journal article	Proposed architecture for sensor-based smart monitor system for AAL homes	Global	2014
Ambient Assisted Living Devices Interoperability Based on OSGi and the X73 Standard.	Report	Use of Open Service Gateway architecture in AAL	Global	2013
Ambient Assisted Living Ecosystems of Personal Healthcare Systems, Applications and Devices	Report	Conceptual framework providing a holistic view of all AAL ecosystems. Architecture of CareStore Platform and its sub-systems	Global	2013
Diversity & interoperability : wireless technologies in ambient assisted living	Report	AAL is considered in light of the diversity of its constituent sensor components and the use of lightweight middleware architectures.	Global	2010
ICAA names top 10 trends in active aging	Press release	Context in which medical device regulations might influence mobile platforms Examples illustrating FDA's proposed classification (medical/non-medical) of connected devices based on risk	Global	2011
ISA-Platform: "Integrated Service Areas"	Web portal	Roadmap for implementation of mHealth solutions	Denmark Germany Japan Netherlands Sweden Switzerland US	2013
Sensor Technology Innovations Enabling Quantified Self -- new era of	Presentation	Convergence scenarios	Global	2014

| Name of document	Type of document	Brief description of content	Geography	Reference year
self-monitoring				
Understanding Medical Device Regulation for mHealth A Guide for Mobile Operators	Report	Context in which medical device regulations might influence mobile platforms Examples illustrating FDA's proposed classification (medical/non-medical) of connected devices based on risk	US and Europe	2012
Vision of Smart Home: The Role of Mobile in the Home of the Future	Report	Wide- and Home-area networking standards Interoperability development and standards	Global	2011-2016
Wearable Computing: New Market Opportunities and Challenges	Presentation	Taxonomy of the Wearable Technology market	US	2012-2018
What's Ripe? What's Not? Understanding Key Enabling Technologies in Wearable Computing	Report	Insights into the need for advances in energy storage, security, ergonomics, standards, and connectivity in order to fulfill the promise of wearable technologies.	Global	2013

Table 51 Summary of Interoperability and Standards Documents for US and Canada

Name of document	Type of document	Brief description of content	Geography	Reference year
2015 Advancing Canada's next generation of healthcare	Report	Vision for Health IT in Canada	US	2012
Connecting Patients with Providers: Pan-Canadian Study on Remote Patient Monitoring	Report	RPM framework	US	2012
Core Operational Guidelines for Telehealth Services Involving Provider-Patient Interactions	Report	Guidelines for implementation and use of telemedicine	US	2011
Understanding Medical Device Regulation for mHealth A Guide for Mobile Operators	Report	Context in which medical device regulations might influence mobile platforms Examples illustrating FDA's proposed classification (medical/non-medical) of connected devices based on risk	Canada	2009
Wearable Computing: New Market Opportunities and Challenges	Presentation	Taxonomy of the Wearable Technology market	Canada	2009

Table 52 Summary of Documents Related to Monitoring the Main Players for Europe

| Name of document	Type of document	Brief description of content	Geography	Reference year
ALT Market in the UK - AKTIVE Market Report	Report	Classification of supply side technology and service players State of ALT supply and demand in the UK	UK	2013
Assisted living in Europe technology and market trends 2010	Presentation	Major ALT vendors	Europe	2009
Assisted Living UK Capabilities and Opportunities Report	Report	Breakdown of the private companies selling products and services into the assisted living market	UK	2012
Business Models to Support New Approaches to Assisted Living in a Consumer Market	Presentation	Business models	UK	2014
Deloitte - Assistive ICT Workshop Presentation	Presentation	Data on ICT players in 8 EU countries	Europe	2011
Development of a non-invasive CAPactive sensor oral MOUSE interface for the disabled elderly - D1.4: Market Analysis	Report	List of interface device producers	Europe	2011
Equipment for older and disabled people: an analysis of the market	Report	NHS supply chain	UK	2010
European Smart Homes and Assisted Living Market (2010 – 2015)	Report	Competitive landscape Main players High growth segments of the market	Europe	2011
Growing the Assisted Living market using managed service framework supply chains	Report	Service model framework and taxonomy of elements for Assisted Living Managed Services Key attributes of a Managed Service provider Companies who have received - or declared - sales totalling over £100,000 from the UK's Telecare, Telehealth and Telecoaching procurement framework RM784	UK	2013
Healthy Ageing Network of Competence	Web portal	Information on network, partners, initiatives	Germany -	2014

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Name of document	Type of document	Brief description of content	Geography	Reference year
			Netherlands	
ICT enabled independent living for elderly: A status-quo analysis on products and the research landscape in the field of Ambient Assisted Living (AAL) in EU-27	Report	Number of product providers Top ranking product providers Highly Active Product Providers	Europe	2010
Long Term Care and Ambient Assisted Living (AAL) in Germany	Report	Government funding programs	Germany	2013
Market Developments – Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth	Report	Main players in the Remote Patient Monitoring and Treatment, Telecare, Fitness/Wellness and mHealth Markets	Europe	2012
MarketsandMarkets: European Smart Homes and Assisted Living - Advanced Technologies and Global Market Worth €152.2 million	Report	Company profiles and competitive outlook	Europe	2010-2015
Smart Home: Hope or hype?	Report	Key players in smart homes market Business models	Europe	2013
South East Health Technologies Alliance (SEHTA)	Web portal	Health-related database, contacts of main players	UK	2014
The "Open Platform" Track in EU for Achieving AAL Market-Breakthrough	Presentation	The REAAL Consortium members	Europe	2013
The ageing marketplace: how some companies are successfully addressing the needs of the older consumer, whilst others are struggling to access this expanding market.	Report	Examples of companies capitalizing on opportunities offered by an aging population Companies discussed in the report include Intel, Danone and Philips.	UK	2012
UK database of assistive devices	Web portal	Details of national daily living equipment suppliers	UK	2014

Table 53 Summary of Documents Related to Monitoring the Main Players for the other world regions

Name of document	Type of document	Brief description of content	Geography	Reference year
Beyond Trade-offs: How Medical Device Manufacturers can Balance Innovation, Quality and Compliance While Improving Profit	Report	Profile of "Advancers" in Medical Device industry Strategies for success in the Medical Device industry Operational metrics	US	2012
Connected Health Opportunities for Service Providers	Report	Role of ISPs in healthcare	US	2013
Emerging Market Opportunities for Small Business in the Independent/Assisted Living Sector	Presentation	Vendor market landscape (2010)	US	2010
Jawbone raises more than $100 million	Magazine article	Report on the financial activities of Jawbone -- a consumer electronics startup company	US	2013
Rise of Connected Living and What it Means for ICT	Presentation	Key players in Connected Living Value chain of Smart Solutions	Global	2014
Self-Care Medical Devices Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 - 2019	Abstract	Companies covered: - 3M Healthcare - Abbott Laboratories - Bayer AG - F .Hoffmann-La Roche - GE Healthcare - Johnson & Johnson - Medtronic, Inc. - Omron Healthcare - Philips Healthcare - ResMed, Inc.	Global	2013
Sensor Technology Innovations Enabling Quantified Self -- new era of self-monitoring	Presentation	List of key players Implications for key market segments	Global	2014
Socio-Economic Impact of Mobile Health	Report	mHealth Market stakeholders	Cluster 1: Norway, Denmark, Sweden,	2012

Name of document	Type of document	Brief description of content	Geography	Reference year
			Hungary, Serbia, Montenegro Cluster 2: Thailand, Malaysia, Russia Cluster 3: Bangladesh, Pakistan, India	
Top 20 Wearable Technology Companies 2014	Report	Profile of top 20 "Wearable Technology" providers	Global	2014
Vision of Smart Home: The Role of Mobile in the Home of the Future	Report	Communications Service Provider Activity in the Smart Homes Market	Global	2011-2016
Wearable Computing: New Market Opportunities and Challenges	Presentation	Brands US consumers favour	US	2012-2018
Wearable Technology – Market Assessment	Presentation	Top 20 vendor profiles including marketshare	Global	
Worldwide Wearable Computing Device 2014-2018 Forecast and Analysis #247318	Report	Data re wearable health and wellness wearable technologies such as Fitbit devices, Jawbone's UP bracelet, Nike+Fuelband	Global	2014

Table 54 Summary of Documents related to data on number, type and size of funding initiatives: Venture Capital financing, Seed Funding, IPOs in AAL field

Name of document	Type of document	Level of access	Brief description of content	Geography	Reference year	Frequency of updates
ArcticStartup	Blog/Online database	Free	Profiles of startup companies from the Arctic region	Nordic and Baltic countries	2014	Daily
CB Insights	Online database	Free subscription/Paid subscription for premium content	Data on private companies and their investors and private company M&A activity, covering technology green tech/clean tech and life sciences	Worldwide	2014	Daily
CrunchBase	Blog/Online database	Free/Paid subscription for premium content	Information about major companies, startups, investors and executives in the tech ecosystem	Worldwide	2014	Daily
Freshnews	News website	Free	U.S. tech news aggregator	US	2014	Daily
IVC-Online	Online database	Paid subscription	Listings of Israeli high-tech companies, VC and private equity funds, angles, investment companies, technological incubators, service providers, entrepreneurs and key executives	Israel	2014	Daily
myFrenchStartup	Online database	Free	Information about French startups, including company description, revenue, fundraising, investors and other	France	2014	Daily
StartUp Health Insights	News website/Online database	Free subscription	Digital health funding database	Worldwide	2014	Daily
VC Experts	Online database	Free subscription/Paid subscription for premium content	Specialized content on private equity & venture capital fundraising, valuation & deal term details on privately funded companies	Worldwide	2014	Daily
VentureBeat	News website	Free	News and perspective on technology innovation	Worldwide	2014	Daily
VentureDeal	Online database	Free/Paid subscription for premium content	Information about venture-backed technology companies, venture capital firms and transactions in the United States	US	2014	Daily

Table 55 Summary of Documents related to number, type and size of investment facilitators: Business Angels, Accelerators, and Incubators in AAL field

Name of document	Type of document	Level of access	Brief description of content	Geography	Reference year	Frequency of updates
CB Insights	Online database	Free subscription/Paid subscription for premium content	Data on private companies and their investors and private company M&A activity, covering technology green tech/clean tech and life sciences	Worldwide	2014	Daily
CrunchBase	Blog/Online database	Free/Paid subscription for premium content	Information about major companies, startups, investors and executives in the tech ecosystem	Worldwide	2014	Daily
IVC-Online	Online database	Paid subscription	Listings of Israeli high-tech companies, VC and private equity funds, angles, investment companies, technological incubators, service providers, entrepreneurs and key executives	Israel	2014	Daily
StartUp Health Insights	News website/Online database	Free subscription	Digital health funding database	Worldwide	2014	Daily
VC Experts	Online database	Free subscription/Paid subscription for premium content	Specialized content on private equity & venture capital fundraising, valuation & deal term details on privately funded companies	Worldwide	2014	Daily
VentureBeat	News website	Free	News and perspective on technology innovation	Worldwide	2014	Daily
VentureDeal	Online database	Free/Paid subscription for premium content	Information about venture-backed technology companies, venture capital firms and transactions in the United States	US	2014	Daily

Table 56 Summary of Documents related to data on number, type and size of other market oriented initiatives: M&A in AAL field

Name of document	Type of document	Level of access	Brief description of content	Geography	Reference year	Frequency of updates
CB Insights	Online database	Free subscription/Paid subscription for premium content	Data on private companies and their investors and private company M&A activity, covering technology green tech/clean tech and life sciences	Worldwide	2014	Daily
CrunchBase	Blog/Online database	Free/Paid subscription for premium content	Information about major companies, startups, investors and executives in the tech ecosystem	Worldwide	2014	Daily
Freshnews	News website	Free	U.S. tech news aggregator	US	2014	Daily
Mandasoft	News website/Online database	Free/Paid subscription for premium content	Information service that provides mergers and acquisitions data	Worldwide	2014	Daily
Telecompaper	News website	Free/Paid subscription for premium content	Research and news on the telecommunications industry	Worldwide	2014	Daily
VC Experts	Online database	Free subscription/Paid subscription for premium content	Specialized content on private equity & venture capital fundraising, valuation & deal term details on privately funded companies	Worldwide	2014	Daily
VentureBeat	News website	Free	News and perspective on technology innovation	Worldwide	2014	Daily
VentureDeal	Online database	Free/Paid subscription for premium content	Information about venture-backed technology companies, venture capital firms and transactions in the United States	US	2014	Daily

Table 57 Summary of Documents related to data on number, type and size of organizations receiving financing: Start Ups in the AAL field

Name of document	Type of document	Level of access	Brief description of content	Geography	Reference year	Frequency of updates
ArcticStartup	Blog/Online database	Free	Profiles of startup companies from the Arctic region	Nordic and Baltic countries	2014	Daily
CB Insights	Online database	Free subscription/Paid subscription for premium content	Data on private companies and their investors and private company M&A activity, covering technology green tech/clean tech and life sciences	Worldwide	2014	Daily
CrunchBase	Blog/Online database	Free/Paid subscription for premium content	Information about major companies, startups, investors and executives in the tech ecosystem	Worldwide	2014	Daily
IVC-Online	Online database	Paid subscription	Listings of Israeli high-tech companies, VC and private equity funds, angles, investment companies, technological incubators, service providers, entrepreneurs and key executives	Israel	2014	Daily
Medtech Company Startups Database	Online database	Paid subscription	Online database of medical technology company startups including contact details, business/product/technology descriptions and other data with records searchable by keyword and categorized by clinical/technology segment	U.S., Europe, Middle East and Asia/Pacifi	2014	Daily

Name of document	Type of document	Level of access	Brief description of content	Geography	Reference year	Frequency of updates
myFrenchStartup	Online database	Free	Information about French startups, including company description, revenue, fundraising, investors and other	France	2014	Daily
StartUp Health Insights	News website/Online database	Free subscription	Digital health funding database	Worldwide	2014	Daily
VC Experts	Online database	Free subscription/Paid subscription for premium content	Specialized content on private equity & venture capital fundraising, valuation & deal term details on privately funded companies	Worldwide	2014	Daily
VentureBeat	News website	Free	News and perspective on technology innovation	Worldwide	2014	Daily
VentureDeal	Online database	Free/Paid subscription for premium content	Information about venture-backed technology companies, venture capital firms and transactions in the United States	US	2014	Daily
VentureSource	Online database	Paid subscription	Information about venture-backed companies including financial, product and service provider details for companies in all stages of development and working in every industry and sector	Worldwide	2014	Daily