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	Responsible partner:	
INOVA+		
Editors:		
Miguel Sousa (INOVA+)		
Ana Solange Leal (INOVA+)		
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<p><b>Abstract:</b></p> <p>This Guidelines handbook provides information about the context situation in the home countries of the <b>AgeingWell</b> founding members, delving into micro and macro environment for ICT and Ageing. Then, it points out the main existing market barriers which hamper the uptake of ICT solutions for Health and Ageing. Finally, it will map public and private funding possibilities, by analysing available funding schemes focused on ICT and Ageing both at European and National levels.</p> <p>A second version of this document will be produced on the 24<sup>th</sup> Month with updated information regarding the situation on national contexts and available funding schemes, in which existing venture capital firms, business angels and other private equity firms will be identified for each country of the founding members.</p>		

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## 1 Introduction

### 1.1 Background

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.

To achieve its aim, the following five **main objectives** of the **AgeingWell** project are:

- **Develop** guidelines for deployment and sharing of best practice between key competence centres;
- **Build** an ICT for Ageing Knowledge Centre with the aim to share the results with the Ageing Well Community;
- **Develop** an ICT for Ageing Society Strategic Agenda, with the aim of providing a study on options for future structure and implementation of EU innovation funding;
- **Promote** the European innovation reinforcement between innovative ICT industries and Ageing (in particular SMEs) and Venture Capital firms, Business Angels and other;
- **Raise awareness** within the European community of ICT and Ageing stakeholders through web-based communication and the organization of 3 international events and 11 national events.

### 1.2 Summary

This Guidelines handbook provides information about the context situation in the home countries of the **AgeingWell** founding members, delving into micro and macro environment for ICT and Ageing. Then, it points out the main existing market barriers which hamper the uptake of ICT solutions for Health and Ageing. Finally it will map public and private funding possibilities, by analysing available funding schemes focused on ICT and Ageing both at European and National levels.

A second version of this document will be produced on the 24<sup>th</sup> Month with updated information regarding the situation on national contexts and available funding schemes, in which existing venture capital firms, business angels and other private equity firms will be identified for each country of the founding members.

## 2 Member States Context

Europe is ageing and over the next forty years societies will change substantially. Several factors are contributing for this situation, namely<sup>1</sup>:

- The number of people over 65 will treble over the next thirty years – the number over eighty years old will quadruple;
- The demand for health and care services in later life is increasing over the years;
- The European workforce is shrinking due to an ageing population, which brings new socio-economic and cultural challenges;
- Europe is experiencing a rapid urbanisation and an expansion of online services.

Considering the challenges ahead, the European Commission has launched seven flagship initiatives focusing on those areas seen as the most relevant to ensure a sustainable growth of Europe. One of these flagships is “A digital agenda for Europe” that aims to speed up the roll-out of high-speed Internet and uptake of information and communication technologies (ICT), namely those that can be used for providing new health services for facilitating the ageing process and promoting an independent living for longer<sup>2</sup>. As such, this flagship initiative represents a great opportunity for the ICT companies operating in Europe, as their goods and services will be further required as a way of dealing with different needs of an ageing population.

Therefore, the ICT sector can contribute for tackling this reality and to provide support to both the population and businesses in order to reach a smart, sustainable and inclusive development of the European society and economy. In fact, the relevance of ICT for Ageing has been acknowledged as a priority for Europe, having into consideration that *the fusion of IT with biotechnology will lead to telemedicine and telemonitoring applications that will profoundly affect the patient-doctor relationship and further the emergence of new patterns of information-sharing and communication within all actors in the healthcare system*<sup>3</sup>.

The ICT sector is one of the most important sectors for boosting the competitiveness and innovation within Europe. The value added of this sector in the European Union (EU) amounted to € 470 billion in 2009, representing a share of 4.0% of EU gross domestic product (GDP), with over 6.1 million people working in this sector, representing 2.7% of employment in the EU<sup>4</sup>. On the other hand, the Health sector in the EU employs almost 10% of the total workforce and corresponds to almost 9% of GDP<sup>5</sup>.

In the following sections, a brief presentation of the population and economical environment for the development of the ICT for Health sector will be made for each country of the founding members of the **AgeingWell** Network.

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<sup>1</sup> **AgeingWell** Annex 1 Description of Work

<sup>2</sup> The European Union Explained: Europe 2020: Europe’s Growth Strategy. December 2012.

<sup>3</sup> European Commission (2009), Monitoring foresight activities in Europe and the rest of the world, EFMN Final Report.

<sup>4</sup> The 2012 Predict Report - An Analysis of ICT R&D in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.

<sup>5</sup> Industrial Innovation, eHealth. Retrieved from: [http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/ehealth/index\\_en.htm](http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/ehealth/index_en.htm)

## 2.1 Belgium

Belgium has a population of about 11 million people, where 17% is aged over sixty-five<sup>6</sup>. The elder population tends to increase as a reflexion of the ageing phenomena occurring all over Europe, which will contribute for increasing the old-age dependency ratio that was of 26% in 2011<sup>7</sup>.

Economically, the global financial crisis caused a slowdown in Belgium economy aggravated by a Public Debt nearing 98% of the national GDP<sup>8</sup>. Following an increase of 1.9%, the growth estimated for 2012 was of 0%, which led the country to face a budget consolidation to reach a more sustainable debt level in the medium term.

Located in central Europe, Belgium benefits from a strong geographical advantage for establishing business throughout the EU and beyond, namely concerning services provision, as the Belgium economy is service based. In fact, the services sector represents over 75% of all economic activity. The labour market has a highly skilled workforce, with about 48%<sup>9</sup> of the active population engaged in Science and Technology, and over 12%<sup>10</sup> working in technology and knowledge-intensive sectors in health and social work areas.

Concerning the use of internet, in 2011, more than 75%<sup>11</sup> of households had internet access of which 96% are high-speed internet connections<sup>12</sup>. In 2005, only 50% of the households were connected, so there was a high positive increase in this domain. About users, in 2010, 33%<sup>13</sup> were 65 or more years old, which is a relatively high percentage in contrast to other European countries, from which 19% (in 2011)<sup>14</sup> accessed Internet for seeking health-related information.

The ICT sector represented, in 2006, 6% of Belgium GDP and it is mainly composed by very small enterprises (2500 enterprises of less than 10 persons), although there are also well known big companies in the country, such as Philips and Siemens. The sector is mainly focused on the provision of services. In addition, confirming the relevance of this sector is the heavily investment in R&D, representing near 20% of total R&D efforts in Belgium<sup>15</sup>, although it has been diminishing due to the financial crisis that Europe is facing for a few years.

Nevertheless, Belgium has the infrastructures for developing an ICT for the Ageing sector and thus supporting its ageing population, with clear benefits in social and economic terms. The existence of clusters related to this area stresses the importance of the sector for the Belgium society, as follows:

- **BioWin, The Health Cluster of Wallonia** - created in July 2006, BioWin brings together all the Walloon stakeholders participating in innovative projects and/or training in the fields of biotechnology and healthcare. The cluster intends to promote the strengths of local stakeholders in the fields of biotechnology for healthcare and medical technology internationally<sup>16</sup>.

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<sup>6</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>7</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>8</sup> In 2011, the Belgium GDP was of 369.836 millions EUR. Source: EUROSTAT DATABASE Database, GDP and main.

<sup>9</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>10</sup> EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level

<sup>11</sup> EUROSTAT Database, Households - Level of Internet access

<sup>12</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>13</sup> EUROSTAT Database, Internet activities – Individuals

<sup>14</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

<sup>15</sup> EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts).

<sup>16</sup> <http://www.biowin.org>

- **FlandersBio** - Founded in 2004, it is a not-for-profit umbrella organisation for the life sciences and biotechnology sector in Flanders, aiming at building sufficient critical mass to attract new R&D companies, investors, service and technology providers<sup>17</sup>.
- **Healthcare Belgium** - a non-profit organisation established in 2007 by the most prominent Belgian hospital groups, holding a multitude of international collaboration agreements at the level of the Ministries of Health, academic institutions and hospitals. Collaborations consist in academic and clinic knowledge transfer, health technology implementation (including equipment and medical devices) and patient treatment<sup>18</sup>.

## 2.2 Bulgaria

In January 2012, over 7 million of people constituted the Bulgarian population, where almost 18% was aged over sixty-five<sup>19</sup> with a dependency ratio of 27%<sup>20</sup>. Following the situation in the rest of the European countries, these percentages have been increasing during the last few years and therefore represent challenges for the Bulgarian social security system and its sustainability.

In 2011, GDP was of over 38 billions of Euros with an estimate of 2% growth by 2014<sup>21</sup>. The Public Debt reaches 16%<sup>22</sup> of the GDP. Thus, despite the economic crisis and difficulties existing in Europe, Bulgaria has been managed to have one of the lowest public debts, which gives positive signs for the coming years.

The Bulgarian economy is still based on industry, although it is visible an increasing contribution of the services sector for GDP. Despite the active population with qualification in Science and Technology (31.1% in 2011)<sup>23</sup>, the employment rate in technology and knowledge-intensive sectors on Health and Social Work represented, in 2007, less than 5%<sup>24</sup>. Also, the country has one of the EU's lowest percentages on R&D investment, representing only 0.57% of its GDP in 2011<sup>25</sup>.

In terms of infrastructures for the ICT the country has been witnessing a fast development, with over 50% of household, in 2012, having access to the internet, when in 2006 this rate was of 17%<sup>26</sup>. Currently, 89% of the access to the internet is made through a high-speed connection<sup>27</sup>. In addition, in 2010, only 3%<sup>28</sup> of the population aged over sixty-five was using the internet and only 5%<sup>29</sup> of these users accessed it for seeking health related information, which represents one of the lowest percentages in the EU.

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<sup>17</sup> <http://flandersbio.be>

<sup>18</sup> <http://www.healthcarebelgium.com>

<sup>19</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>20</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>21</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>22</sup> EUROSTAT Database, Government consolidated gross debt

<sup>23</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>24</sup> EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level

<sup>25</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>26</sup> EUROSTAT Database, Households - Level of Internet access

<sup>27</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>28</sup> EUROSTAT Database, Internet activities – Individuals

<sup>29</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

According to the Bulgarian Association of Software Companies (BASSCOM), the ICT sector generated almost 9% of the GDP in Bulgaria, in 2010. The sector is composed mainly by small and medium enterprises dedicated to the provision of services. In fact, in 2009, 98% of the value added in the ICT sector was provided by ICT services sub-sectors<sup>30</sup>. However, the investment in R&D related to ICT is not very significant, representing in 2007 around 1%<sup>31</sup> of the overall investment in R&D in Bulgaria, which, as mentioned before, is very low (0.57%).

Nevertheless, there are some organisations in Bulgaria whose objective is to promote the ICT sector and eHealth solutions and services, as a way of improving the country's economy:

- **Foundation “Bulgarian Cluster for Information and Communication Technologies”** – created in 2005, its main objective is ICT SME growth and development through the promotion of cooperation, building competitiveness and creation of new business opportunities<sup>32</sup>.
- **E-Health Bulgaria Foundation** - a non-profit and non-governmental organization, established to boost the development of the e-health on a national level as a part of the electronic government of the Republic of Bulgaria, and which cooperates with all participants and interested parties in the healthcare process, such as the Ministry of Healthcare, the National Health Insurance Fund, private health insurance funds, hospitals, pharmacies, laboratories, medical doctors and patients<sup>33</sup>.

## 2.3 Cyprus

Cyprus is a small Mediterranean country with a population of less than one million people, where almost 12% of people is over sixty-five years old (below EU average of 17.5%)<sup>34</sup>. The old dependency ration reached 18% in 2012<sup>35</sup>. This situation makes Cyprus one of the youngest countries in Europe.

The Public Debt raised to almost 70% of the GDP in 2011<sup>36</sup>, partially due to the banking crisis which arose in 2008 and to the exposure of Cypriot banks to Greek bonds that pushed the country's economy to a recession, which still produces its effects today, and forced an EU bailout request by public authorities as well as loans from Russia. With forecasts indicating that GDP growth will be negative in the next few years (estimates of -2.3% in 2012, -3.5% in 2013 and -1.3% in 2014)<sup>37</sup>, times will be challenging in the near future.

The Cyprus economy is dominated by the service sector in which communication technologies related services play a very important position. In fact, in 2009, 99% of the added value in the ICT sector was provided by ICT services sub-sectors<sup>38</sup>, which clearly demonstrates the existing focus of the economy activities. The country has attracted major players in this sector, such as IBM, Oracle and Microsoft to establish operations there, and thus contributing to a high employment rate in ICT

<sup>30</sup> The 2012 Predict Report - An Analysis of ICT R&D in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.

<sup>31</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>32</sup> <http://www.ictalent.org>

<sup>33</sup> <http://www.ehealth-bg.org>

<sup>34</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>35</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>36</sup> EUROSTAT Database, Government consolidated gross debt

<sup>37</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>38</sup> The 2012 Predict Report - An Analysis of ICT R&D in the EU and Beyond. Joint Research Centre Scientific and Policy Reports, 2012.

jobs. The workforce of Cyprus is highly qualified in Science and Technology areas, with a share of 45%<sup>39</sup> of the active population in 2011. Nevertheless, the percentage of people working on technology and knowledge-intensive sectors on Health and Social Work is still very low (4% in 2008<sup>40</sup>), which can be partially explained due to demographic factors and to the fact that the majority of the economy is focused on the provision of telecommunication services.

In terms of infrastructures related to ICT, in 2012, 62%<sup>41</sup> of the households had internet access (which represents a rate below the EU average) of which almost 95%<sup>42</sup> through a high-speed connection. Concerning internet users, in 2011, almost 6% were older than 65 years old (against EU's average of 24%), and only 5% of these users were seeking health information on the internet (against EU's average of 18%).

## 2.4 France

France, the second biggest economy and one of the most populous countries in Europe, has a population of 65 million people of which almost 17%<sup>43</sup> is older than sixty-five. The French population ageing will be a slower process than in other countries in Europe, due to high fertility rate and to the low increase on the population aged 65 and over. Estimates from the French National Institute for Statistics and Economic Studies foresees that nearly one person in four will be aged 60 or over by 2015, and more than three in ten by 2035. Concerning the old dependency rate, statistics show a rate of almost 26% in 2012<sup>44</sup> that has been increasing in the last years.

Although France has been resisting to the effects of the financial crisis that Europe is facing since 2008, the country Public Debt represented around 86% of GDP in 2011<sup>45</sup> and growth estimates are not very positive with rates near 0% for 2013 and 1% for 2014<sup>46</sup>.

The French economy is mostly based on the services sector, although industry also has a relevant contribution for the overall GDP. France is one of the leading nations in ICT sector as some of the major players are located there, such as France Telecom, Capgemini, or ST Microelectronics. This sector contributed, in 2009, around 4% for the French GDP<sup>47</sup>. In 2008, the French ICT market accounted for 16% of the total European market; moreover, France is ranked second in the world for the proportion of science and technology graduates in the active population<sup>48</sup>, reaching a rate of 45% in 2011<sup>49</sup>.

Qualified workers in science and technology are also employed on sectors related to health and social services, reaching a rate of 12.5%<sup>50</sup> of the total employment in 2008.

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<sup>39</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>40</sup> EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level

<sup>41</sup> EUROSTAT Database, Households - Level of Internet access

<sup>42</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>43</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>44</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>45</sup> EUROSTAT Database, Government consolidated gross debt

<sup>46</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>47</sup> EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)

<sup>48</sup> France's Sectors of Excellence, Key Figures 2008, retrieved from <http://www.invest-in-france.org/Medias/Publications/233/TIC.pdf>

<sup>49</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>50</sup> EUROSTAT Database, Annual data on employment in technology and knowledge-intensive sectors at the national level

In 2012, Internet access was available in 80%<sup>51</sup> of households of which 89%<sup>52</sup> were high-speed connections. These rates confirm the investment made by the French government in promoting the growth of the digital economy in the country. Also, the percentage of internet users aged sixty-five or more, reached 30% in 2010<sup>53</sup>. Moreover, in 2011, 23%<sup>54</sup> of internet users accessed the internet to look for health information (one of the higher rates in Europe), which reveals that the elderly population has been adopting ICT in their lives.

The interest on the promotion of a digital economy is confirmed clearly also by the investment in R&D activities, being equivalent to 2.25% of GDP in 2011<sup>55</sup>. There are several clusters in France created for supporting the development of economic activities within several sectors, namely ICT and Health, as those described next:

- **Eurobiomed Biocluster Méditerranée** – created in 2009 as a non-for-profit organisation, its main objective is to promote the excellence of the academic and industrial healthcare research performed in South East of France, namely through the establishment of synergies between healthcare stakeholders such as companies, research centres and educational institutions. These synergies can boost the development of novel therapeutics, diagnostic tools, medical devices and healthcare services<sup>56</sup>.
- **Medicen Paris Region** - Founded in 2005, this global competitiveness cluster aims to position the Paris Region (which includes Paris, Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Essonne, Yvelines and Val-d'Oise) as a European industrial leader in diagnostic and therapeutic innovation and leading-edge health technologies<sup>57</sup>.
- **Systematic Paris Region Systems and ICT Cluster** – this cluster aims to raise the Paris-Region at the international top level of the ICTs, particularly in the area of Software-Intensive Systems. Its activities have been creating synergies between SMEs, Large Companies, Research Laboratories and they allow the emergence of innovative projects on the following areas: automotive and transport, free and open source software, digital trust and security, smart energy management, systems design and development tools, and telecoms<sup>58</sup>.

## 2.5 Greece

With a total population of 11 million people, demographics data state that, in 2011, almost 19%<sup>59</sup> of the Greeks were aged sixty-five or more. This represents one of the highest rates in Europe regarding the elderly population. Moreover, the country presented, in 2012, an old age dependency ratio of 29.9%<sup>60</sup> which is also one of the highest rates registered in the European countries. This situation arise future challenges to Greece regarding the sustainability of the social security systems and employment, which are reinforced by a Public Debt of more than 170%<sup>61</sup> of the country's GDP, which

<sup>51</sup> EUROSTAT Database, Households - Level of Internet access

<sup>52</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>53</sup> EUROSTAT Database, Internet activities – Individuals

<sup>54</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

<sup>55</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>56</sup> <http://www.eurobiomed.org>

<sup>57</sup> <http://www.medicen.org>

<sup>58</sup> <http://www.systematic-paris-region.org>

<sup>59</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>60</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>61</sup> EUROSTAT Database, Government consolidated gross debt

continues to rise. According to estimates, the recovery of the GDP is foreseen for 2014 with a growth of 0.6%<sup>62</sup>. Till then the prevision is of negative growth rates for the country's economy.

The most important sector for the composition of the Greek GDP is the services sector, with the public sector playing an important part. As regards the Greek ICT sector, it is mainly focused on telecommunications, partially because of the establishment of big players in the country such as Nokia, Microsoft and Deutsche Telekom. These companies were able to find in Greece qualified human resources as 32.4%<sup>63</sup> of the active population, in 2011, had a Science and Technology background. In addition, the Greece's expenditure on R&D corresponded, in 2007, only to 0.6%<sup>64</sup> of the country's GDP, from which 10.8%<sup>65</sup> was invested in R&D for ICT (in 2005).

In comparison with the other countries in Europe, in 2010, Greece had one of the lowest rates regarding households with internet access (54%)<sup>66</sup>. Nevertheless, of the existing accesses 93%<sup>67</sup> were high-speed connections. Besides, when analyzing information about users, only 3% were aged sixty-five or more, and only 2% of these users accessed the internet for seeking information related to health issues.

In 2006, the first organisation in Greece for the structured and systematic management and development of innovation clusters was established: **Corallia – Hellenic Technology Clusters Initiative**<sup>68</sup>. Corallia became the first systematic national cluster initiative, with the purpose of promoting competitiveness, entrepreneurship and innovation, in knowledge-intensive, exports-oriented and high-technology fields where Greece can attain a worldwide competitive advantage. This initiative has generated a cluster focused on **Nano/Microelectronics-based Systems and Applications (mi-Cluster)**<sup>69</sup> in which some of its one hundred and thirty members are developing services/products for the health area.

## 2.6 Italy

Italy has a population of over 60 million people of which 20% is aged over sixty-five<sup>70</sup>. The elderly population has been increasing in the past few years and it is anticipated to reach, in 2050, 33% of the population<sup>71</sup>. In addition, the old dependency ratio was of 30.9%<sup>72</sup> in 2011. Considering the projected ageing of the Italian population, it is expectable that also the old dependency ratio will raise and therefore there will be an increasing number of potential beneficiaries of health and pensions. This scenario will represent future social and economic challenges for the country, which was forced to adopt, recently, austerity measures to tackle its Public Debt matching, in 2011, 120.7%<sup>73</sup> of the GDP.

<sup>62</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>63</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>64</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>65</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>66</sup> EUROSTAT Database, Households - Level of Internet access

<sup>67</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>68</sup> <http://www.corallia.org>

<sup>69</sup> <http://www.corallia.org/en/innovation-clusters/mi-cluster-knowledge-base.html>

<sup>70</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>71</sup> United Nations (2009). World Population Ageing 2009. Department of Economic and Social Affairs, Population Division.

<sup>72</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>73</sup> EUROSTAT Database, Government consolidated gross debt

In terms of infrastructures, in 2012, 63% of Italian households had internet access, which represents a good improvement related to 2002 when there were only 34%<sup>74</sup>, but still below the average of the EU. The same regarding the type of connection used as only 85% of the households have a high-speed connection, while the EU average is of 91%<sup>75</sup>. When analyzing internet users aged sixty-five or over, in 2010, it consisted of 9%<sup>76</sup> of Italian users; and only a very small fraction of these users (7% in 2011<sup>77</sup>) accessed the internet for seeking information related to health. Thus, Italian elderly population is still reluctant in using ICT and measures need to be undertaken to motivate these citizens to adopt new technologies as mean for a healthier ageing process.

Regarding the labour market, 32.9%<sup>78</sup> of the Italian active population has skills on Science and Technology. A part of them is employed in the Italian ICT sector, the fourth largest ICT market in Europe and one of the most advanced mobile communications market in the world. It is composed by 97.000 companies and 390.000 employees<sup>79</sup>, which activity represented, in 2008, around 3.5%<sup>80</sup> of the Italian GDP. Moreover, since 2003, the expenditure on R&D has been corresponding to almost 1%<sup>81</sup> of GDP, of which 9.6%<sup>82</sup> has been spent on R&D related to the ICT sector.

There are several organizations supporting the development of the Italian ICT sector, and some of those focus on promoting the improvement of ICT for Ageing and Health areas, as the following:

- **ICT Innovation Cluster (Polo ICT)** – managed by the Torino Wireless Foundation, the Polo ICT is a network of excellence that has more than 150 members, among companies, universities and research centres, and key players in supporting innovation in the ICT sector<sup>83</sup>.
- **Etna Valley** – it is the Technological Cluster “Micro and Nanosystems” which aims at developing research, innovation and entrepreneurship capacities referring, among others, to the following areas: optoelectronics, bioelectronics, biosensoristics and bioinformatics; molecular and organic photonics; and applications in ICT sector<sup>84</sup>.
- **bioPmed Cluster** – it is an innovation cluster dedicated to bio and medical technologies, gathering about eighty companies, research centres and three academic institutions. This cluster is led by the Bioindustry Park Silvano Fumero, a science and technology park founded in 1998<sup>85</sup>.

## 2.7 Latvia

Latvian population has been gradually decreasing over the last decades and is currently around 2 million people. Its elderly population comprised, in 2011, 18.6% of the total number of inhabitants

<sup>74</sup> EUROSTAT Database, Households - Level of Internet access

<sup>75</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>76</sup> EUROSTAT Database, Internet activities – Individuals

<sup>77</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

<sup>78</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>79</sup> Invitalia's Inward Investment, Investment opportunities: ICT. Retrieved from

<http://www.invitalia.it/site/eng/home/investment-opportunities/ict.html>

<sup>80</sup> EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)

<sup>81</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>82</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>83</sup> <http://www.poloinnovazioneict.org/>

<sup>84</sup> <http://www.etnavalley.com>

<sup>85</sup> <http://www.biopmed.eu>

which was above the EU average (17.5%)<sup>86</sup>. This situation influences the old age dependency ratio that rose from 23.3% in 2003 to 27.7% in 2012, making it one of the highest in the EU<sup>87</sup>.

The access to the internet has been increasing significantly during the last years. In 2003, only 15% of Latvian households had internet access. This rate increased to 69% in 2012<sup>88</sup>, and of these households, 94% had a high-speed connection<sup>89</sup>. Besides, the number of elderly users has been growing fast. In 2004, only 1% of the internet users were aged sixty-five or over; while in 2010 they constituted 10% of the overall users<sup>90</sup>. Moreover, 11% of elderly users accessed the internet for seeking information related to health<sup>91</sup>.

Despite the ageing population, after an economic decline in 2008, the Latvian economy is growing well above the EU's average registering an increase of 5.5% on its GDP, in 2011. Estimates indicate that the economy will continue to grow around 4%<sup>92</sup> in the next years. Also, the existing Public Debt is one of the lowest in Europe, corresponding to 42% of the Latvian GDP<sup>93</sup>.

The Latvian ICT sector is composed by around 3000 companies employing near 25 000 persons. Most of the companies are of small dimension, which economy activity contributed, in 2007, for 4.2% of the country's GDP<sup>94</sup>. The percentage of the active population with skills in Science and Technology was, in 2011, of 36.8%<sup>95</sup>; however due to a wave of emigration this rate has been decreasing as skilful human resources are leaving the country in the search for better professional opportunities.

On the other hand, Latvia is still lagging behind other EU countries in terms of investment on R&D with an expenditure of less than 1%<sup>96</sup> of its GDP allocated to R&D. As for the investment on R&D for the ICT sector it represented, in 2006, 1.5%<sup>97</sup> of the overall expenditure in this field, which is really small.

To promote synergies between ICT companies in Latvia in order to enhance their competitiveness, the **Latvian IT Cluster**<sup>98</sup> was established in 2007. It aggregates around twenty leading enterprises working with information systems, as well as the University of Latvia and the Riga Technical University. Recently, the IT Cluster with partners from Lithuania and Belarus created a cross-border Baltic IS cluster which by combining the potential of some 296 companies aims to compete with the U.S. and India. In addition, the **Latvian Information and Communications Technology Association (LIKTA)**<sup>99</sup> is a professional association, founded in 1998, that brings together more than eighty ICT product and service providers, educational institutions, as well as individual professional members of the Latvian ICT industry sector, namely in computer hardware and software, electronics, and telecommunications infrastructure and service providers.

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<sup>86</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>87</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>88</sup> EUROSTAT Database, Households - Level of Internet access

<sup>89</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>90</sup> EUROSTAT Database, Internet activities – Individuals

<sup>91</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

<sup>92</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>93</sup> EUROSTAT Database, Government consolidated gross debt

<sup>94</sup> ICT RTD Audit - Latvia, Prof. Imants Freibergs. "ICT Research capabilities in Latvia", November 2011. Retrieved from <http://is.jrc.ec.europa.eu/pages/ISG/PREDICT/documents/Latvian-ICT-Budapest.pdf>

<sup>95</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>96</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>97</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>98</sup> <http://www.itbaltic.com>

<sup>99</sup> <http://www.likta.lv>

## 2.8 Poland

With a population of 38 million people, Poland has one of the youngest societies in Europe, where only 13.8%<sup>100</sup> of people are aged sixty-five or over. This situation resulted also, in 2012, on a low old dependency rate of 19.4%<sup>101</sup>.

Polish economy has been able to resist to the existing crisis in Europe. In this sense, its GDP grew almost 4% in 2011<sup>102</sup> and forecasts indicate a continuing growth, even if in lower rates. In addition, the Public Debt represented, in 2011, 56.4%<sup>103</sup> of the country's GDP, which is below many other EU countries and reflects the positive moment the Polish economy is living.

Although with a solid industrial sector, Polish economy is largely based on services. In 2009, the ICT sector contributed for 3%<sup>104</sup> of the Polish GDP, which shows the limited relevance of this sector for the country economy. According to the Polish Agency for Enterprise Development, there are currently 8 500 ICT companies which operations contributes with 4.8% of the Polish GDP, and estimates foresee it will rise to 9.5% in 2020<sup>105</sup>. These companies employ around 400 000 people. The number of people qualified in Science and Technology has been increasing over the last years, corresponding to 35.3% of the active population in 2011<sup>106</sup>, but still below the EU average (42%). A similar situation is visible concerning the investment on R&D activities as the expenditure in this area was, in 2011, still below 1% of the country's GDP<sup>107</sup>.

Concerning the access to the internet, Poland's situation has evolved positively over the years. In 2002, 11% of the households had internet access; however, in 2012, this rate increased to 70%<sup>108</sup>, of which 91%<sup>109</sup> had a high-speed connection. Due to the age structure of the Polish society, when analyzing internet users, it is easier to understand a low rate of users aged sixty-five or over, which was of 9% in 2010<sup>110</sup>. In addition, the numbers on internet usage by individuals aged 65 or more are also relatively low, with only 9% of internet users representing the elderly population in 2010, and only 5% of elder citizens seeking health information on the internet. Also, seeking health related information on the internet was performed only by 6%<sup>111</sup> of the elderly users, which shows that this is not yet a favoured means for accessing information by this age group.

Synergies between stakeholders within the ICT sector are being boosted by different organizations, such as:

- **Wielkopolska ICT Cluster** – founded in 2008 by the Poznan Supercomputing and Networking Center (Polish Academy of Science), the Poznan City Hall and various ICT companies from the

<sup>100</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>101</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>102</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>103</sup> EUROSTAT Database, Government consolidated gross debt

<sup>104</sup> EUROSTAT Database, Percentage of the ICT sector on GDP - Total (National Accounts)

<sup>105</sup> Polish Agency for Enterprise Development, Bożena Lublińska-Kasprzak, "ICT sector in Poland. The story of dynamic growth", CeBIT 2013. Retrieved from <http://www.parp.gov.pl/files/74/101/614/615/15865.pdf>

<sup>106</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>107</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>108</sup> EUROSTAT Database, Households - Level of Internet access

<sup>109</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>110</sup> EUROSTAT Database, Internet activities – Individuals

<sup>111</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

region, the clusters brings together over fifty companies, three research centres and a local government<sup>112</sup>.

- **LifeScience Klaster Krakow** – a network of institutions from which agreed to collaborate in order to develop and deliver to the market innovations in the field of life sciences, comprising seventy entities from six areas of interest: Enterprises, Education, Institutes of Research and Development, Healthcare, Business environment, and Administration<sup>113</sup>.
- **Eastern Poland IT Companies Cluster** – this association is coordinated by the IT Association in Podkarpacie and aims at contributing to the development of the Polish IT sector by supporting the implementation of joint investment enterprises, business cooperation, exchange of experiences, conducting IT and promotion campaigns<sup>114</sup>.

## 2.9 Portugal

Similarly to other countries in Europe, the Portuguese population of 10 million people has been decreasing over the years, due to a decline in the birth rate, as well as to an increasing wave of emigration, namely of the young active population. Thus, in 2011, 19.1%<sup>115</sup> of the inhabitants in Portugal are aged sixty-five or over and the country has an old dependency ratio of near 30%<sup>116</sup>, both rates are of the highest in Europe, which definitely will bring important challenges related to healthcare of the elderly and to the sustainability of the social security system.

Besides, Portugal is under the IMF/EU program for economical recovery through which several austerity measures are being taken with strong impact on the competitiveness of the economy and on the quality of life of the population. In 2011, the Public Debt reached 108.1%<sup>117</sup> of the GDP and estimates indicated it will have a negative growth until 2014.

The active population in Portugal has 25.5% of people qualified in Science and Technology fields, below the EU average, and many are leaving the country in the search of job opportunities and better work conditions. This situation can result in the lack of skilful people working in Portugal, who are necessary to leverage the current economic situation. In addition, the Portuguese economy is mainly based on the services sector, where the ICT sector comprises over 14 000 companies employing a total labour force of 79 000 people<sup>118</sup>. Regarding Portugal's expenditure on R&D in percentage of GDP, in 2011, it was of 1.5%<sup>119</sup>, the double of the overall investment on R&D made in 2003. The ICT sector was responsible for 3.1% of the R&D expenditure in 2007<sup>120</sup>.

With regard to internet users, in 2010, 10%<sup>121</sup> of all users in Portugal were aged sixty-five or over, from which 9%<sup>122</sup> used the internet to find health related information. However, these rates are still

<sup>112</sup> <http://wklaster.pl>

<sup>113</sup> <http://lifescience.pl>

<sup>114</sup> <http://www.klasterit.pl>

<sup>115</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>116</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>117</sup> EUROSTAT Database, Government consolidated gross debt

<sup>118</sup> AICEP, Portuguese ICT. Retrieved from:

<http://www.portugalglobal.pt/EN/InvestInPortugal/ProminentSectors/Sectors/Pages/PortugueseICT.aspx>

<sup>119</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>120</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>121</sup> EUROSTAT Database, Internet activities – Individuals

<sup>122</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

below EU's average and campaigns need to be held to motivate elderly population to use further ICT. In addition, in 2011, almost 60%<sup>123</sup> of the households had internet access, and although this ratio is below the EU's average, concerning the type of connection, 99%<sup>124</sup> of these households had a high-speed connection, one of the highest rated in the EU.

The Portuguese Government launched in 2008 (Aviso AAC n.º 01/EEC/2008) an initiative for the creation of clusters with the purpose of boosting innovation and qualification of various sectors, as well as of raising their visibility internationally. Considering the ICT for Ageing area there are two relevant clusters:

- **Health Cluster Portugal (HCP)** – formally recognized by the Portuguese Government in July 2009, is a private non-profit association supported by members from business, academia, hospitals and local authorities that aims to enhance the competitiveness of Portuguese products and services for health and the improvement of health care<sup>125</sup>.
- **TICe.pt** – The Center for Information, Communication and Electronics Technologies (TICE.PT), was formally recognized by the Portuguese Government in August 2009. The technological and knowledge-related spheres underlying TICE.PT's areas of intervention are, among others, the following: wireless networks; ubiquitous multimedia communications; interface devices (sensors, actuators); and ontologies and engineering for domains of application clusters<sup>126</sup>.

## 2.10 Romania

Romania has a population of 21 million people, of which almost 15%<sup>127</sup> are aged sixty-five or over. The existing old dependency ratio is of 21.5%, below EU's average (26.2%)<sup>128</sup>. The elderly population composed, in 2010, only 2% of the overall internet users in the country, which is one of the lowest rates in Europe and way below the EU's average (24%). In fact, only 54% of the Romanian households have access to the internet. Although it is a low rate comparatively with other European countries, it means a great increase in the national reality since, in 2003, only 6% of the households had internet access<sup>129</sup>. Regarding the type of connection, in 2011, 72% of the households with access to the internet, had a high-speed connection<sup>130</sup>.

As in many other European countries, the financial crisis impacted negatively the Romania economy resulting, in 2009, on a negative growth of -6.6% in the GDP, which has been surpassed only in 2011, when GDP growth rate was of 2.2%. It is expected that GDP will continue to grow positively in the forthcoming years<sup>131</sup>. Nevertheless, the Public Debt was of 33% of GDP, in 2011<sup>132</sup>, which attest the economical recovery that is being achieved in the country.

<sup>123</sup> EUROSTAT Database, Households - Level of Internet access

<sup>124</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>125</sup> <http://www.healthportugal.com>. HCP is a founding member of the AgeingWell Network.

<sup>126</sup> <http://www.tice.pt>

<sup>127</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>128</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>129</sup> EUROSTAT Database, Households - Level of Internet access

<sup>130</sup> EUROSTAT Database, Broadband and Connectivity – Households

<sup>131</sup> EUROSTAT Database, GDP and main components (forecast)

<sup>132</sup> EUROSTAT Database, Government consolidated gross debt

Concerning the labour market, only 23.7% of the active population is qualified in Science and Technology. During the last decade the number of companies in the IT industry tripled to 11.000, as well as the number of employees estimated at 60.000 in 2010 only for the software segment<sup>133</sup>.

Romania is still behind the majority of EU countries when referring to R&D expenditure. In 2011, the total investment on R&D was of less than 0.5% of the GDP<sup>134</sup>; which constitutes one of the lowest rates in Europe. Some organisations have been working to improve the competitiveness of the Romanian economy, namely through the generation of synergies among different economic actors and the promotion of R&D projects. Among these organisations, the following should be named:

- **West Region Romania** – it was established in 2011 as the association „Regional Cluster for Information and Communication Technology - West Region Romania", with the aim of promoting and supporting the regional ICT enterprises in becoming global market players, with their own products, under a strong regional brand<sup>135</sup>.
- **Romanian Society of Medical Informatics (RSMI)** – created in 1990, RSMI has currently over one hundred members among physicians, computer scientists, engineers, mathematicians and other professionals working in the field of medical informatics. The aim of RSMI is to promote the activities in the development of medical informatics in Romania and to represent the activities in the country and abroad<sup>136</sup>.

## 2.11 Spain

Demographic statistics show that the Spanish population is increasing, with a population of 46 million people in 2012, corresponding to 5 million people, more than in 2003. Regarding the elderly population, in 2012, it comprised 17.4%<sup>137</sup> of the population with an old dependency ratio of 25.8%<sup>138</sup>. With this situation and attending to the overwhelming unemployment rate of 25% (the highest in Europe), Spain will face in a near future important challenges related to the sustainability of its social security system.

In 2012, 68% of the Spanish households had internet access, of which 95% were made through a high-speed connection. Below EU's average, in 2010, the internet was used by 12%<sup>139</sup> of the elderly population in Spain of which only 7%<sup>140</sup> used it to look for health related information. In this sense, an effort has to be made at national level to raise the interest and increase the use of internet among the elderly population.

Economically, Spain is undergoing a crisis reflected in the high rate of unemployed people and also on its Public Debt which reached 69% of the GDP in 2011<sup>141</sup>. Forecast indicates that GDP will continue

<sup>133</sup> Technology Transfer Network for BSEC Region Project, "Romanian ICT Industry", retrieved from [http://www.bsec-tech.com/eng/knowledge\\_hub/romania/ict\\_profile](http://www.bsec-tech.com/eng/knowledge_hub/romania/ict_profile)

<sup>134</sup> EUROSTAT Database, Total intramural R&D expenditure (GERD) by sectors of performance

<sup>135</sup> <http://www.regiuneavest.ro>

<sup>136</sup> <http://medinfo.umft.ro>

<sup>137</sup> EUROSTAT Database, Structural Indicators, Population on 1 January

<sup>138</sup> EUROSTAT Database, Structural Indicators, Old dependency ratio

<sup>139</sup> EUROSTAT Database, Internet activities – Individuals

<sup>140</sup> EUROSTAT Database, Internet activities – Individuals (Internet use: seeking health information)

<sup>141</sup> EUROSTAT Database, Government consolidated gross debt

to have a negative growth in the coming years, which can be aggravated by the decline of other European economies.

Even though the percentage of human resources in Science and Technology has been growing, 33.4% in 2003 and 38.8% in 2011<sup>142</sup>, it is still relatively low when compared to economies of similar dimension within the EU. One of the sectors in which these human resources can find a job is the ICT sector, which constitutes one of the most relevant in Spain. This sector is composed mainly by SMEs, accounting for more than 450 000 direct jobs, and contributing with around 5.8% for the Spanish GDP in 2010<sup>143</sup>. The Spanish expenditure on R&D is lower than in other EU countries corresponding, in 2011, to 1.3% of the GDP whereas the EU's average was 2%. The investment of the ICT sector consisted in 3.3% of the overall expenditure on R&D made in 2007<sup>144</sup>.

There are several organizations supporting the development of the Spanish ICT sector, and some of those focus on promoting the improvement of ICT for Ageing and Health areas, as the following:

- **Madrid Network** - it was created for the purpose of promoting innovation in the Community of Madrid and positioning its economy among those of the most advanced regions worldwide. It includes five science and technologic parks and twelve clusters, among which the "Madrid Platform for Health and Wellbeing Cluster", grouping together the major innovative companies in the Healthcare sector in Madrid, Research Centres, Service and Administration Companies and User Groups<sup>145</sup>.
- **TicBioMed** – it is a cooperation platform for technology firms, health organisations, universities and other stakeholders involved in technological innovation applied to medicine, healthcare and biology in the Murcia Region (Southeast Spain). The cluster aims to develop innovative interactions between health organisations and their suppliers, in order to align health needs to the services provided by ICT firms and university work groups<sup>146</sup>.
- **ClusterTic** – established in 2008, the Barcelona Digital's ICT Cluster is an Association of Innovative Enterprises created as a meeting place and networking for start-ups, small and medium companies and other entities for the use of boosting the competitiveness of the Catalan ICT sector. One of the areas in which ICT solutions have been introduced is the pharmaceutical sector, in which ICT allows the development of new models of prevention, diagnosis and treatment, and can optimize the planning and information management of the pharmaceutical and health environments<sup>147</sup>.
- **BioCat** – this organization coordinates and promotes the biotechnology, biomedicine and medical technology sector in Catalonia, through synergies among stakeholders in this area and their initiatives to create an environment with a strong research system, active transfer of knowledge and an entrepreneurial business fabric. It comprises 520 companies, 440 research groups and 54 research centres, 10 universities which offer life sciences studies and 15 hospitals with noteworthy research activity<sup>148</sup>.

<sup>142</sup> EUROSTAT Database, Annual data on HRST and sub-groups by NUTS 2 regions

<sup>143</sup> Invest Spain, Sectors, ICT. Retrieved from:

[http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992\\_6261761\\_6279208\\_0,00.html](http://www.investinspain.org/icex/cda/controller/interes/0,5464,5322992_6261761_6279208_0,00.html)

<sup>144</sup> EUROSTAT Database, R&D expenditure (BERD) of businesses in ICT sector as % of total R&D expenditure

<sup>145</sup> <http://www.madridnetwork.org/en/red/salud>

<sup>146</sup> <http://www.ticbiomed.net/>

<sup>147</sup> <http://www.bdigital.org>

<sup>148</sup> <http://www.biocat.cat>

### 3 Market Barriers

Barriers are those factors that limit and hamper the diffusion and commercialization of new products or services in a given economical market. The ICT for the Ageing solutions market is in an early stage of development. Thus, entrepreneurs and organisations willing to deploy new products or services in this field need to overcome the existing barriers in order to be able to succeed in this emergent market.

Stakeholders and interested players in this market have been discussing potential strategies to tackle the recognized market barriers that include the following:

- Limited knowledge concerning users needs;
- Insufficient awareness of market opportunities;
- Low level of interoperability of products/services;
- Lack of common standards within the various EU countries;
- Undefined business and financing models.

These main barriers identified will be described in the next sections.

#### 3.1 Limited knowledge concerning users needs

Besides the elderly population, the users of products and services of the ICT for the Ageing market also include the care givers and the solutions providers. To ensure the successful exploitation and deployment of ICT for Ageing products and services, a clear understanding of the needs of all these users is fundamental.

The CAPSIL Roadmap<sup>149</sup> indicates several studies that confirm the adoption of a new IT product or service is firmly linked to the user's perception about the benefits he/she will gain by acquiring or using that IT product or service. Other factors that are relevant for the user's acceptance are related to comfort, i.e., if the product consists on a familiar device (or the service is provided by one) making it easier to be accepted by users; and to the language adopted to describe or provide the service, which should be tailored to the user's profile.

When the needs of the users are not taken into consideration during the development of a product or a service, the successful exploitation might be at risk, due to the inadequacy of those products or services to meet consumer's real needs. In addition, if an older adult is not able to use a device or to understand how a service works, this situation can increase *their sense of frustration and dependency*<sup>150</sup>. On the other hand, as highlighted by the SWOT Analysis formulated by the FORSEE

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<sup>149</sup> International Support of a Common Awareness and Knowledge Platform for Studying and Enabling Independent Living.

<sup>150</sup> European Commission (2007) Ageing well in the Information Society, An i2010 Initiative: Action Plan on Information and Communication Technologies and Ageing, SEC(2007)811

partnership<sup>151</sup>, *failure to engage with people in health management roles in charge of implementing new systems is also a significant barrier* for the uptake of ICT products and services for Ageing.

In this sense, when designing and developing a new product or service for this sector and for these users, the solutions providers need to be aware of the factors that can influence its adoption and commercialization. These factors include socio-economic aspects, *gender needs and income levels that may impede access to ICT, personal attitudes and sensitivities to ICT, and even of lifestyles*<sup>152</sup>.

One of the available strategies to tackle this market barrier consists on the adoption on **user-centered approaches** for the development of new products or services. Instead of a list of requirements defined by the solution provider, the product or service is designed according to the user's needs, attitudes and behaviours, who will be collaborating by giving feedback and inputs during the development phase, which will result in a more user-friendly and satisfying final product/service.

### 3.2 Insufficient awareness of market opportunities

This market barrier refers to the lack of visibility of existing players and technologies among ICT industry, intermediaries and final users. This situation can contribute for the low adoption of products and solutions addressing the elderly population, and for the inexistence of higher collaboration between ICT solutions providers.

Besides improving communication efforts at the time of launching a new product or service, it is necessary to invest further on user empowerment. This strategy requires a strong effort on informing users (e.g. older adults, caregivers, health institutions) about the available products and services, with a special emphasis on how this product/service can enhance their daily routine, personal health and quality of life. By being aware of the advantages of these solutions, users will be curious and willing to discover this market and what it has to offer, which can leverage its competitiveness.

On the supply side, insufficient awareness about existing solutions and competitors can lead to an uncertain environment to implement investments in research and technological development addressing the ICT for the Ageing market. In addition, generally, in Europe every university, research centre, SME, and solution provider makes its own way, which causes the wheel to be reinvented again and again. This is one of the effects of fragmentation of the market at national, regional and local levels that constrain the development of the ICT for the Ageing market.

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<sup>151</sup> SWOT Analysis on the theme "ICT for Health". 2012

<sup>152</sup> Idem.

### 3.3 Low level of interoperability of products/services

Interoperability, according to the norm ISO/IEC 2382-01, is defined as *“the capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units”*<sup>153</sup>.

The relevance of this feature for the ICT for Ageing products and services is due to the fragmentation of the European market. The eHealth Taskforce report *“Accelerating the Development of the eHealth Market in Europe”*<sup>154</sup> refers that each country has its own ICT for the Ageing market with specific operation conditions and needs, which limits the possibility of generating economies of scale for ICT for Ageing solution providers, resulting in higher costs in order to introduce a new product/service on the market and to make it available in different international markets. Besides responding to national markets differences, the ICT for Ageing products and services, to be fully adopted and sustainable, need to allow integration with other products/services and connection between different organisations (e.g. hospitals, laboratories) to enhance healthcare. Thus, interoperability is one of the major barriers to be overcome in the coming years.

In addition, the e-Health market in Europe, like several other markets of innovations, suffers also from the fragmentation of public demand which in turn leads to a lack of exchangeability of products and services. The setting of different requirements by individual buyers at local, regional and national levels, the limited cooperation between procurers and between procurers and suppliers to develop solutions applicable across different member States are major barriers<sup>155</sup>.

### 3.4 Lack of common standards within the various EU countries

Defining standardization criteria for ICT solutions for Health and Ageing is difficult. One of the reasons is the multiplicity of technologies that comprise the offer within the ICT for Ageing market, which can integrate different standards according to its features (e.g. data protection, software, security). As such, the creation of common standards for this field needs to address all the existing requirements for the different features an ICT solution for Ageing can have.

According to the ITU-T Technology Watch Report *“E-health Standards and Interoperability”* (2012), *unless a critical mass of healthcare technology providers adheres to the same standards for electronic health records, the system will not provide the anticipated cost efficiencies and healthcare quality improvements*. In this sense, it is essential to foster a closer relationship and cooperation among the solutions providers, as well as other relevant stakeholders (especially health professionals to ensure their needs are met), to allow an open dialogue and joint definition of the standards to be accepted and adopted by the whole supply chain of the ICT for Ageing market. Public authorities can play a key role in this *“negotiation”* by leading the discussion and deciding on policies to boost these synergies and reach a common agreement on the necessary standards.

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<sup>153</sup> Information Technology Vocabulary, Fundamental Terms

<sup>154</sup> European Commission, 2007

<sup>155</sup> FORSEE Partnership, 2012. SWOT Analysis on the theme *“ICT for Health”*

Overcoming this barrier will contribute positively to surpass the interoperability challenge mentioned above.

### 3.5 Undefined business and financing models

Business models intend to support organisations in their commercial efforts and to ensure a return on investment. In the Ageing sector, defining a business model is a more challenging task as the objectives are related to health and ageing processes that include various factors (e.g. social factors) that are not very easy to measure or foresee. In addition, identifying a funding source for ICT solutions for Ageing is still demanding, as due to low awareness of the market opportunities private financial mechanism are not yet willing to invest in a product/service that does not present clear economical advantages.

This market barrier has been a subject of many projects and studies due to its relevance for Europe. The TechnoAGE Study<sup>156</sup> intended to assess the current situation regarding business and financing models for existing innovative ICT solutions for ageing well and to disseminate the lessons learned from a set of selected cases studies. One of the findings of the study is related to geographical differences that influence the way the ICT for the Ageing market operates, dividing Europe in three “types” of market:

- Formal: mainly Anglo Saxon and Scandinavian regions, where the markets are more formal and stable, but also innovative. The technology is mainly user-driven, specialised and advanced.
- Informal: in which the market is more traditional and not yet mature. Technology is usually “one-size-fits-all”. This type of market encompasses the Mediterranean and Eastern Europe regions.
- Mix of both types above: including mainly Continental regions.

According to the final report on “Business Models for eHealth” produced by Rand Europe and Capgemini Consulting<sup>157</sup>, besides a strong knowledge of the market and users, *there is a need for public policy actions supporting the development of value-creating business models for eHealth*. Nevertheless, these policies will only be efficient and successful if all the relevant stakeholders (e.g. national healthcare authorities, research centres, industry) are involved to provide and share experiences.

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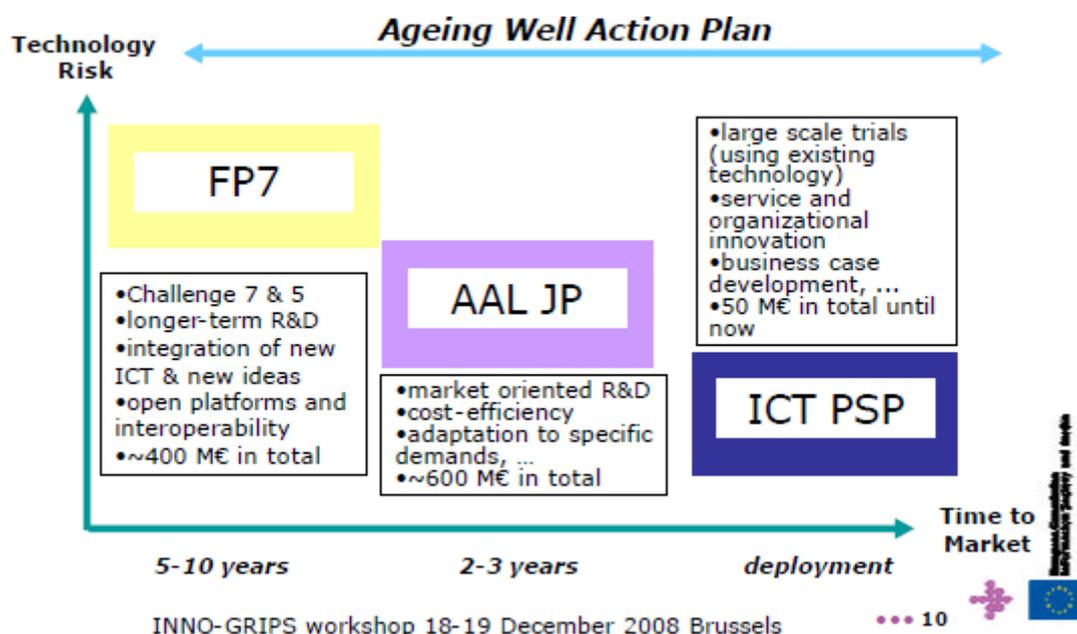
<sup>156</sup> TechnoAGE website: [www.technolage.org](http://www.technolage.org)

<sup>157</sup> European Commission, DG Information Society and Media, 2010

## 4 Mapping of public and private funds

### 4.1 European funding opportunities

The existing European funding opportunities for ICT and Ageing include three main programmes, as presented in the image below.



#### Seventh Framework Programme for Research and Technological Development (FP7)

[http://cordis.europa.eu/fp7/home\\_en.html](http://cordis.europa.eu/fp7/home_en.html)

FP7 aims to strengthen the scientific and technological base of European industry and to encourage its international competitiveness, while promoting research that supports EU policies. ICT is one of the priority Themes considered in the FP7 Work Programme, which aims at *improving the competitiveness of European industry and enabling Europe to master and shape future developments in ICT so that the demands of its society and economy are met*. Within this theme, funding is available for projects addressing, among other, the following challenges:

- Challenge 5: ICT for health, ageing well, inclusion and governance

The focus under this challenge is on the development of ICT solutions for empowering individuals as a citizen, elderly, patient and consumer, enabling them to better manage their lives and to improve their quality of life.

- Challenge 7: ICT for the Enterprise and Manufacturing

Aiming to strengthen the capabilities of the European industry, namely SMEs, this challenge foresees the development and adoption of ICT solutions, emerging innovative technologies and processes to enhance the efficiency, adaptability and sustainability of the industrial sector, as well as to improve its competitiveness at a global scale.

## **Ambient Assisted Living (AAL) Joint Programme**

<http://www.aal-europe.eu>

AAL intends to boost the development and adoption of ICT solution as a means for enhancing the quality of life of the elderly population, enabling an active and healthy ageing. At the same time, through the use of ICT, AAL aims at promoting industrial opportunities in Europe by bringing together SMEs, research centres and user's organizations.

A special feature of this programme is that project proposals are submitted and evaluated by the AAL Central Management Unit, but the funding is implemented at national level by a National Funding Agency.

The 6<sup>th</sup> Call for proposals<sup>158</sup> focus on "ICT-based Solutions for Supporting Occupation in Life of Older Adults" with the objective of allowing older adults to preserve health and motivation to remain active and maintain an occupation, either by paid or voluntary work.

## **Information and Communication Technologies Policy Support Programme (ICT-PSP)**

<http://ec.europa.eu/cip/ict-psp>

The ICT-PSP aims at stimulating a wider uptake of innovative ICT based services and the exploitation of digital content across Europe by citizens, governments and businesses, in particular SMEs. Particular focus is giving to ICT technologies addressing wide interests of the European population, such as means for coping with an ageing society. Thus, the programme finances projects aiming to the development and/or exploitation of ICT based services in areas as health, ageing and inclusion; and improvement of public services.

The second version of the Guidelines Handbook, to be delivered by the 24<sup>th</sup> Month, will include detailed information on the future funding programmes of the European Commission, such as Horizon 2020 - Framework Programme for Research and Innovation<sup>159</sup> and Programme for the Competitiveness of enterprises and SMEs (COSME) 2014-2020<sup>160</sup>.

## **4.2 National funding opportunities**

### **4.2.1 Belgium**

BRAIN-be | Belgian Research Action through Interdisciplinary Networks

[www.belspo.be](http://www.belspo.be)

The Council of Ministers has approved on the 5<sup>th</sup> of October 2012 the first phase of the research programme BRAIN-be (2012-2018). Open to the whole Belgian scientific community, including universities, public scientific institutions and non-profit research centres, this programme comprises

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<sup>158</sup> Sixth Call for Proposals of the AAL JP: <http://www.aal-europe.eu/launch-of-call-6>

<sup>159</sup> Horizon 2020 website: <http://ec.europa.eu/research/horizon2020>

<sup>160</sup> COSME 2014 – 2020 website: <http://ec.europa.eu/cip/cosme>

six thematic areas, namely: Ecosystems, biodiversity, life sciences; Geo-systems, universe and climate; Cultural, historical and scientific heritage; Public strategies; **Major societal challenges**; and Management of collections. Funding is available for two types of research projects:

- Partnership projects up to four years, and
- Pioneer projects up to two years.

The thematic area related to **Major societal challenges** *is based on major societal challenges and relates to an array of important concerns for individuals and society such as demographic changes, democracy, migration, safety, poverty, sustainable development, health and environment, globalisation, and multiculturalism*<sup>161</sup>. One of the challenges the BRAIN-be programme aims to tackle is concerning **Health, Well-Being and Ageing**.

#### SME – Innovation Projects

[www.iwt.be](http://www.iwt.be)

IWT, the government agency for Innovation by Science and Technology in the Flemish Region, has a funding programme available for projects, run by a **SME**, aiming at the development of **innovative products, processes and services**: “*Kmo-innovatieprojecten*”<sup>162</sup>. The selected projects have to bring innovation into the SME and can consist on the development of a completely new or a significantly innovative product, process or service with clear impact on the business.

#### WIST 2

<http://recherche-technologie.wallonie.be/fr/menu/themes/tic/le-programme-wist-2.html>

The Walloon Government has established priority areas for the development and future growth of the region. One of the key areas is related to ICT, which is seen as of transversal importance for all the other areas. In this sense, the investment in this area is fundamental for the differentiation of companies in the region and for enhancing their competitiveness. Projects funded by WIST 2<sup>163</sup> need to target the acquisition and development of knowledge in the field of ICT skills which Walloon companies can rely to develop products, processes or new or substantially improved services. Within the targeted technology areas, two are directly related to Ageing Well: Integrated biomedical information for better health; and Signal processing for biomedical applications.

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<sup>161</sup> Belspo website, Call for proposals: [http://www.belspo.be/belspo/organisation/Call/forms/Brain2012/BRAIN-be\\_dosinfo\\_E\\_call2012%20pioneer.pdf](http://www.belspo.be/belspo/organisation/Call/forms/Brain2012/BRAIN-be_dosinfo_E_call2012%20pioneer.pdf)

<sup>162</sup> IWT website: <http://www.iwt.be/programma/kmo-programma>

<sup>163</sup> Gateway to Research and Technologies in Wallonia, Accueil / Thèmes / TIC / Le programme Wist 2 - Wallonie - Information - Société - Technologies: <http://recherche-technologie.wallonie.be/fr/menu/themes/tic/le-programme-wist-2.html>

#### 4.2.2 Bulgaria

Operational Program "Development of the Competitiveness of the Bulgarian Economy 2007-2013"

<http://www.opcompetitiveness.bg>

Approved, on 26<sup>th</sup> September 2007, by the European Commission this operational program aims at improving the Bulgarian economy through the promotion of business sectors' competitiveness and innovation. In order to achieve its objectives, the programme comprises four main priority axes:

1. Development of a knowledge-based economy and innovation activities;
2. Increasing efficiency of enterprises and promoting a supportive business environment;
3. Financial Resources for Developing Enterprises;
4. Strengthening the international market positions of Bulgarian economy.

Access to funding is possible through the submission of proposals to the calls launched by the managing authority. Each call of proposals has specific objectives and requirements that need to be fulfilled by the interested entities and that are presented in proper documents and guidelines.

The National Innovation Fund

<http://www.sme.government.bg>

The National Innovation Strategy was adopted on 8<sup>th</sup> September 2004 by the Decision № 723 of the Council of Ministers. This strategy aims at increasing the competitiveness of the Bulgarian industry, through the introduction of new knowledge-based products, materials technologies for producing, management and services. Open to all legal entities registered under the Bulgarian Commercial Law, funding is available for two types of projects:

- Scientific applied research project, and
- Feasibility studies.

R&D projects should focus on the technological development of new or on substantial improvement of existing products, processes or services, and the maximum duration is three years. As for the feasibility studies, their maximum duration is one year, and their objective is to diminish uncertainties in the field of technological innovations, economic viability and cooperation before starting a R&D project.

#### 4.2.3 Cyprus

Operational Programme Sustainable Development and Competitiveness

<http://www.planning.gov.cy>

The main investment priorities for the period 2007-2013 are described in the Operational Programme Sustainable Development and Competitiveness<sup>164</sup>, which aim at improving the competitiveness of the Cyprus economy within conditions of sustainable development. Within this framework, a specific objective concerns the promotion of the **Knowledge Economy and Innovation**, which includes the *diffusion of the use of information communication technology*, namely regarding the *provision of e-health services*.

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<sup>164</sup> Planning Bureau website, Structural Funds, National Strategic Reference Framework: <http://www.planning.gov.cy>.

#### 4.2.4 France

Research Programmes of the National Agency for Research (NAR)

<http://www.agence-nationale-recherche.fr/programmes-de-recherche>

The NAR has six thematic funding programmes aiming at fostering and strengthening French research and bringing together enterprises, higher education institutions and research centres for the implementation of R&D projects. From the available programmes, two are particularly interesting for the stakeholders involved in ICT for Ageing:

- **Biologie Santé (Health Biology):** this programme funds research projects in biology and biomedical disciplines. It comprises a sub-programme specifically designed to encourage research projects between academia and businesses in the field of Technologies for Health:
  - **TecSan (*Technologies pour la santé et l'autonomie*)**<sup>165</sup>: Its general objective consists on the promotion of innovative applied technologies and methodologies for health and independent living. This purpose will be achieved through three axes: 1) development of breakthrough or disruptive technologies (instrumentation and biosensors, medical imaging, CAMI, biomaterials and tissue engineering, medical devices), 2) e-Health and medical information, and 3) development of innovative technologies and services for rehabilitation, correction or replacement of functional disabilities.
- **Sciences et Technologies de l'Information et de la Communication (Science and ICT):** this programme intends to improve an area of research with high added value and high potential growth in France. It includes four axes: 1) INFRA - development of future broadband communications infrastructure, high performance computing, high-capacity storage, components / optics / advanced treatments necessary to achieve these infrastructures and innovative services, 2) INS - methods and software tools for engineering services and digital systems, embedded systems, and security and trust of information systems, 3) CONTINT - production and exchange of content and knowledge (create, edit, search, interface, use, economy, confidence, enhanced reality, social networks, Future Internet), associated services and robotics, 4) *Modèles numériques* - the development of a "digital double" by the modelling and simulation of the physical world, objects, services and interactions, and human behaviour.

#### 4.2.5 Greece

The National Strategic Reference Framework (NSRF)<sup>166</sup> constitutes the reference document for the programming for the period 2007–2013. Within the Sectoral Operational Programmes defined, there are two which priorities focus on the use of ICT, which are described next.

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<sup>165</sup> NAR, Research Programmes, Technologies pour la santé et l'autonomie: <http://www.agence-nationale-recherche.fr/programmes-de-recherche/biologie-sante/technologies-pour-la-sante-et-l-autonomie-tecsan>

<sup>166</sup> NSRF website: <http://www.espa.gr>

## Operational Programme “Digital Convergence”

<http://www.espa.gr/el/Pages/staticOPDigitalConvergence.aspx>

It focuses on the *promotion of the use of ICT by enterprises, streamlining procedures in the Public Sector, promoting entrepreneurship in sectors making use of ICT, increased utilisation of digital applications in State administration for the benefit of the citizen and **improved quality of life achieved through ICT***. In its Specific Objective 2.1: Improving daily life through ICT – Equal citizen participation in Digital Greece and Objective 2.2: Developing e-services for the citizen, projects have to focus on the development of ICT technologies to promote accessibility, security, interoperability, risk prevention, research, innovation, digital content, etc; and on Citizen Services and applications (e-health, e-gov, e-learning, e-inclusion, etc.)

## Operational Programme “Human Resources Development”

<http://www.espa.gr/el/Pages/staticOPHumanResourcesDevelopment.aspx>

It *intends to contribute, among other things, to the establishment of reforms in the Mental Health sector, development of Primary Healthcare and promotion of Public Health*. This programme presents a call for proposals for measures in support of elderly people in need of assistance, based on a personalized approach to enhance their employability; includes proposals for the provision of support services to seniors and others who need assistance, namely Day Care Centres for the Elderly (KIFI) to provide day care services for older people reliant absolute (physical disabilities, dementia, etc); and supports actions to strengthen social cohesion and improving quality of life and older people in need of home assistance.

#### 4.2.6 Italy

National Operation Programme for Research and Competitiveness (PONREC) 2007-2013

<http://www.ponrec.it>

The PONREC promotes initiatives and projects in the fields of scientific research, industrial competitiveness and innovation in four Convergence regions: namely Calabria, Campania, Apulia and Sicily. The initiatives are managed by the Ministry of Economic Development (MiSE) and by the Ministry of Education, Universities and Research (MIUR). Attending the ICT for Health sectors there some initiatives aiming to support the development of research and innovation in this field, such as:

- Ricerca Industrial (industrial research)<sup>167</sup>: managed by MIUR, this initiative funds projects aiming to support enterprises in the development of innovative products and/or services, and thus contribute to enhance their competitiveness. MIUR has established strategic science and technology areas as priorities for this initiative, such as ICT, and human health and biotechnology;

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<sup>167</sup> PONREC 2007-2013 website, Interventi, Ricerca industriale: <http://www.ponrec.it/programma/interventi/ricerca-industriale>

- Innovazione Tecnologica (Technological Innovation)<sup>168</sup>: MiSE is managing this initiative which provides funding to the business sector for the implementation of research, development and innovation projects related to high technology, in order to promote industrial innovation and competitiveness. The duration of the projects should be of a minimum of 18 months and a maximum of 36 months.

Also the Regional Assemblies are able to launch a call for proposals and competitions for supporting projects in different fields, such as the improvement of ICT infrastructures and Health/Ageing services. As an example, Roma Capitale (regional assembly for the region of Rome), at the end of 2012, launched a call for the provision of a data centre on elder people home assistance<sup>169</sup>. All announcements on open calls are published on the official web pages of each regional assembly.

#### 4.2.7 Latvia

National Research Program of Latvia in Material Sciences (IMIS)

<http://www.cfi.lu.lv/eng/projects/national-research-program-of-latvia-in-materialsciences/program-argumet>

IMIS funds projects that contribute for developing a highly skilled scientific expertise in the area of innovative materials, signal processing and **information technology** enabling the local companies to produce competitive products. This program is coordinated by the Institute of Solid State Physics from the University of Latvia. Started in 2010, the programme will continue till the end of 2013, benefitting the business sector, state administration, and scientific institutions.

#### 4.2.8 Poland

Innovative Economy Operational Programme 2007-2013 (OP IE)

<http://www.poig.gov.pl>

The OP IE, managed by the Ministry of Regional Development, aims at contributing to the improvement of the intervention cohesion within the scope of competence of the ministers in charge of economy, science, tourism and **computerization**. As such, the programme intends, among other objectives, to improve the innovation on the business sector and to **boost the ICT usage in the Polish economy**. The programme finances three types of projects: competitive, systemic, and individual; and the beneficiaries can be entrepreneurs, research centres, enterprises and the public sector. The programme is based on nine priority axes, of which two should be highlighted:

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<sup>168</sup> PONREC 2007-2013 website, Interventi, Innovazione Tecnologica:

<http://www.ponrec.it/programma/interventi/innovazionetecnologica>

<sup>169</sup> Roma Capitale, Dipartimento Promozione Servizi Sociali e della Salute:

<http://www.comune.roma.it/PCR/resources/cms/documents/AvvisoPubblicoSistemaInformaticoAssistenzaDomiciliare.pdf>

- Investments in innovative undertakings: the objective of this priority axis is to increase the number of enterprises using **innovative solutions** and to improve access to external financial resources that encourage innovative undertakings;
- Information society – increase of innovativeness of economy: This priority axis seeks to stimulate the development of the digital economy by supporting the creation of new and **innovative e-services** (e.g. e-health and telemedicine services) as well as **innovative electronic solutions** for business.

#### ADIUVO Investment Fund

<http://www.kfk.org.pl/en/news/sppw/adiuvo-new-polish-biotechnological-fund>

ADIUVO is a private Polish fund that aims to screen and evaluate innovative ideas in the field of **biotechnology and medical devices** developed in the Polish research institutes and universities. It has almost 9.5 million Euros for financing projects at an early development stage and it is grounded on innovative technology that could be protected with a patent in the future.

#### 4.2.9 Portugal

##### COMPETE – Operational Competitiveness Programme

<http://www.pofc.qren.pt>

As part of the National Strategic Reference Framework, the aim of COMPETE is to improve the competitiveness of the Portuguese economy in a global market context, through innovation, scientific and technological development, internationalisation, entrepreneurship and the modernisation of the public administration. Within this programme, the ICT sector can obtain financial support to its projects through the following measures:

- Qualification or internationalisation of SMEs: projects aiming to introduce new working models, to reinforce management capabilities, to adopt ICT, to redesign and improve the organisation's layout and benchmarking actions;
- Industrial R&D projects aiming to foster R&D activities in the ICT field;
- Innovation projects in which ICT solutions can contribute to increase productivity, namely through technology improvements in the production process;
- Administrative modernisation support system: projects in which an intensive use of ICT is required to promote a better interaction with users of public services (companies and citizens).

##### Research Projects Support Funds from the Foundation for Science and Technology (FCT)

<http://www.fct.pt>

FCT aims to promote the advancement of scientific and technological knowledge in Portugal in any scientific or technological domain. Also, it intends to contribute for its diffusion to improve

education, **health**, environment, and the **quality of life and well being** of the general public. In this sense, FCT supports financially research projects through calls for applications in any scientific area which open every year and calls targeted at specific themes or domains.

#### 4.2.10 Romania

Increase of Economic Competitiveness (SOP-IEC)

<http://www.minind.ro>

The SOP-IEC aims to increase the productivity and competitiveness of Romanian companies, in compliance with the principle of sustainable development, and reduce the gap to the average EU productivity. This programme comprises four main priority axes: 1) an innovative and eco-efficient productive system; **2) research, technological development and innovation for competitiveness;** **3) ICT for private and public sectors;** 4) increasing energy efficiency and security of supply in the context of combating climate change.

Through axis 2, this programme intends to enhance R&D capacity, to stimulate the cooperation between R&D institutions and enterprises, and to increase enterprises' access to R&D. In this sense, companies will be able to work jointly with academia and research centres and benefit from the results of their R&D activities, as well as contribute for the research agendas of these institutions in order to become more tailored to the industrial needs.

Axis 3 is fully focused on the exploitation of ICT potential as a means to increase interactions between the public and private sectors. In this sense, funding is available for projects addressing the development and improvement of e-Government, **e-Health** and e-Learning applications for sustaining the economic growth and competitiveness in Romania. The investment in e-Health is seen as key to optimize the processes within the entire healthcare system and to provide higher quality at less cost.

#### 4.2.11 Spain

National Plan for R&D+I 2013 – 2016

<http://www.idi.mineco.gob.es/>

The objectives of the National Plan are to contribute to place the Spanish Science and Technology System in a leading international position, by enhancing capabilities and knowledge, as well as by boosting the competitiveness and innovation of the industrial sector. In order to accomplish these objectives, four national funding programmes were defined: 1) National program for promoting talent and employability in R&D+I, 2) National program for promoting scientific and technical excellence, 3) National program for the business competitiveness in R&D+I, and 4) National program of R&D+I for tackling societal challenges.

The “National program for promoting scientific and technical excellence” intends to fund joint projects aiming at generating scientific and technological knowledge, namely concerning emerging

technologies. It integrates four sub-programmes, of which the National sub-program for the development of **emerging technologies** needs to be stressed due to its liaison with ICT. This sub-programme fund R&D projects aiming at developing breakthrough and disruptive technologies, and addressing exploitation measures for the market uptake of these technologies. As such, projects focused on the development of technologies for health and ageing might be funded by this sub-programme.

In addition, the “National program for the business competitiveness in R&D+I” supports the development and exploitation of Enabling Technologies as considered in “Horizon 2020”, such as photonics, micro and nanoelectronics, nanotechnologies, advanced materials, **biotechnology, ICT**, etc. This can be achieved through the promotion of projects addressing the development of an individual technology, or considering the combination of several of these technologies. Also, this sub-programme foresees the subvention for projects aiming at integrating technologies in existing companies as a way of promoting innovation and competitiveness.

Finally, the “National program of R&D+I for tackling societal challenges” aims to contribute for the strengthening of the relation between academia and business, and to find solutions for the societal challenges Europe is currently facing, through the financial support to R&D+I projects. Considering the challenge related to Active and Healthy Ageing, the priorities established under this sub-programme, among other, are the following:

- Omic and medical imaging technologies for a more personalized medical care, based on the individual rather than on the disease;
- Robotics and nanotechnology as diagnostic instruments and treatment processes;
- Use and diffusion of ICT as a backbone for a more global e-Health on the development of research activities and on the organisation and management of the National Health System.

The second version of the Guidelines Handbook, to be delivered by the 24<sup>th</sup> Month, will include information on the future funding programmes defined at national level, highlighting the priorities and links to the programmes launched by the European Commission.

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