



FINAL PROJECT REPORT

MyGuardian – A Pervasive Guardian for Elderly with Mild Cognitive impairments



Please send this report ELECTRONICALLY to the Central Management Unit (CMU) as well as a copy to the National Contact Persons (NCPs) of the coordinator and project partners

The coordinator of the project must submit this report within 60 calendar days after the final date of the project, on behalf of the consortium.

***If you have any additional question,
please contact the AAL CMU at CMU@aal-europe.eu,
or your NCP (see details on www.aal-europe.eu/aal-ncp)***

Report date	22/06/2015
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PUBLISHABLE PROJECT INFORMATION (TO BE USED BY AALJP)

1A. PROJECT	
Project full title	A Pervasive Guardian for Elderly with Mild Cognitive impairments
Project acronym	MyGuardian
Project No.	AAL-2011-4-027 (see list on www.aal-europe.eu)
Project Website	www.myguardian-project.eu
Project duration	• Starting date: 01/05/2012 • Termination date: 30/04/2015
Coordinator's name and details	Full name: Inmaculada Luengo López E-mail address: iluengo@hi-iberia.es Telephone number: +34 91 458 98 23 <i>* Both e-mail address and tel. number must be provided.</i>

1B. PROJECT PARTNERS					
No.	PARTNER ORGANISATION NAME	PARTNER ORG. ACRONYM	TYPE*	PROJECT COSTS: PUBLIC GRANT IN EURO	PROJECT COSTS: PARTNER OWN CONTRIBUTION IN EURO
1 (coord.)	HI-Iberia Ingenieria y Proyectos SL	HIB	SME	226.320	226.320
2	CETIEX	CETIEX	END USER	153.097,20	102.064,80
3	University of Geneva	UniGe	RTD	200.250	200.250
4	VigiSense	VIGS	SME	220.500	220.500
5	ConnectedCare	CON	SME	127.253	84.835
6	CNRS Ageing, Imaging, Modeling lab	AGIM	END USER	290.000	0
7	Careyn	CAR	END USER	177.407	59.135
*Please select one of these options: SMEs, Large, END USER, RTD, other					

1C. PUBLISHABLE PROJECT RESULTS SUMMARY (1 PAGE)

In this section, please present the results of your project, including the following information:

The MyGuardian project aims at, on the one hand, facilitating safe and secure mobility of seniors with mild cognitive impairments while preserving their autonomy and dignity, and on the other hand, improving quality of life and efficiency of informal carers, providing them a multi-device solution with different applications, each of them focused on the different target end users. Concretely, the MyGuardian solution is composed of two parts:

- **Seniors application:** an easy-to-use mobile application for seniors with MCI which allows them to communicate with caregivers through voice and predefined messages quickly in case of an emergency situation;
- **Caregivers application:** a two-fold (web and mobile) application for informal and professional caregivers which allows a dynamic and seamless distribution of care tasks and responsibilities between informal and supporting professional caregivers, a remote monitoring of the senior state and a detection of risk situations, coordination mechanisms for emergency situations, quick communication with the seniors, and a customization of the solution when configuring his/her own user profile.

Therefore, MyGuardian responds to the need of removing the barriers towards autonomous mobility, and hence, improves physical health, wellbeing, and social life of seniors. At the same time, MyGuardian also encourages wellbeing and efficiency of voluntary caregivers (e.g., family and friends) by ensuring their peace of mind and keeping them informed when the senior is experiencing confusion states and risk situations when out and about, and improves efficiency of professional caregivers by providing them with up-to-date information and by supporting coordination of their care efforts.

The main target users of MyGuardian solution are both elderly people with mild cognitive impairments and his/her close caregivers, especially in the countries of the partners involved in the project: Spain, The Netherlands, France and Switzerland. Nevertheless, the solution can be also used by other seniors living alone who do not present particular limitations but that can strongly benefit from the advantages of MyGuardian. Moreover, elderly care organizations (secondary end users) and public or private institutions (tertiary end users) are also potential users of the MyGuardian solution.

The technical innovations of MyGuardian rely on the provision of a multi-device solution fully oriented to seniors with mild cognitive impairments and their caregivers based on providing a platform which promotes collaboration and communication between them; enabling a dynamic and seamless distribution of care tasks and responsibilities; allowing a rich communication (voice communication with contextual cues such as location and psycho-physiological state) while preserving the senior's peace-of-mind; providing seniors a safe and known environment while preserving their dignity thanks to the use of contextual and profiling data; enabling adaptation of services and settings to individual needs and preferences; and providing intuitive interfaces and communications which help seniors to feel safe and confident in outdoor environments.

MyGuardian also brings several benefits to the society: as it positively affects the quality of life of seniors with mild cognitive impairments and their caregivers at different levels: it allows them to maintain autonomy and mobility, which is a crucial issue for enabling independent and healthy living, (as it is proven that mobility and active lifestyle contributes to slowing down the development of the cognitive impairment); it also guarantees on demand assistance, which is essential for keeping peace of mind when safe moving around safely, especially in an unknown environment; it also enables independent living by allowing seniors to maintain a high degree of independence and autonomy while assuring that assistance can be provided, if required; and it helps seniors to participate into digital self-

service society, while keeping their caregivers informed and calm about the context and state the senior is.

The launch of the MyGuardian solution is estimated after a pre-commercialization phase of 18 months at the end of the project. MyGuardian's go-to-market model is a Business-to-Business model, whereby the care organizations are the customers of MyGuardian Business's partners (MGB). The MGB's sales and marketing efforts will be focused on these players ("push"), while keeping a fair level of Public Relation activity to create a "pull" for the product from informal caregivers.

CONFIDENTIAL PART OF THE REPORT

2. DELIVERABLES SUBMITTED AND MILESTONES ACHIEVED DURING THE PROJECT

In this section, please provide details in case your project deviated from the Description of Work (work plan) with respect to delivery dates, achievement of milestones or changes in planned outputs; please indicate whether and to whom (AAL NFA/NCP) the changes have been communicated.

The project has been completed successfully and on time.

Has the project been finalised in line with the Description of Work?

YES ☒

NO ☐

PARTLY ☐

IN CASE OF DEVIATION, PLEASE EXPLAIN:

Has the project achieved its expected results as described in the Description of Work?

YES ☒

NO ☐

PARTLY ☐

IN CASE OF DEVIATION, PLEASE EXPLAIN:

3 A. PROJECT RESULTS - SCIENTIFIC/TECHNICAL PROJECT RESULTS

Provide a summary of the confidential results, including:

- The progress per work-package
- The performance of the project consortium (added value of cooperation, added value and performance of each partner etc.)
- Scientific/technical achievements during the course of the project
- End-user services developed during the course of the project
- Other confidential information

End-user services developed during the course of the project

The MyGuardian platform services three groups of users: seniors with mild MCI, their informal caregivers and the professional nurses. A mobile application for Android phones has been developed for seniors with mild MCI; the device not only facilitates GPS-based localization and state monitoring, but also facilitates seniors in asking for assistance. A web application (also available as mobile) has been developed for informal and professional caregivers; using the application, caregivers can keep track of the current situation, and can easily communicate and coordinate with other caregivers.

The progress per work-package

WP2

User research, concept development and technical specification have been conducted according to plan with end users involved in the Netherlands, France and Spain. A framework for social impact, privacy and ethics was developed to guide the user involvement.

WP3

Backbone components were developed by the technical partners – including components for

	localization, user profiling, knowledge discovery, communication and remote assessment.
WP4	Whereas a basic version of the applications was developed according to plan, the refinement of the applications required more effort and time than anticipated. The target group of senior users requires a very easy-to-use platform; many technical challenges were faced towards optimal user experience. The applications were developed in 4 major user-centric iterations, in combination with a series of micro-iterations with users in the loop.
WP5	A thorough user validation protocol was developed, covering usability studies and field research. User research with participants with MCI is particularly challenging, since the target group is often not fully aware of their situation and the need for a tool, the senior user group often has difficulties using ICT, and the use setting for MyGuardian involving a network of caregivers is complex. The user validation has resulted in product improvements, improvements in the business model, and a list of future improvements.
WP6	A business plan has been developed by the SMEs in close consultation with the end users. Whereas the commercial market for GPS tracking & geo-fencing is very much alive, and many products have entered the market in the course of the project, the MyGuardian proposition has a USP in combining tracking with flexible incident management.

Scientific achievements

MyGuardian - as a case of innovative technology contributing to quality of life of its users - resulted in 24 peer reviewed publications, 30 scientific presentations on methodology, technology and service provided. Contribution to academic teaching (graduation projects, internships, tutorials and courses).

Technical achievements

- Robust, real-time, battery-efficient location tracking using standard mobile phones
- Flexible, highly accurate definition of location-based zones using standard web interface
- User friendly editing of escalation rules
- Social platform for collaboration of caregivers
- A wide range of functionalities has been integrated in a secure environment that is easy to use, responds timely, and provides accurate access to the current situation

The performance of the project consortium

The combination of end-users with diverse backgrounds, research partners and SMEs with complementary expertise turned out to be a solid basis for the quality of the MyGuardian project. The consortium included clusters (end user + tech partners) in three countries, representing three different contexts for the user research and evaluation. The contribution of TU Delft as a subcontractor optimizing the participatory design trajectory was considered valuable. The experienced designers were crucial towards translating the diverse user requirements into a coherent and usable solution.

Key challenges

Three key challenges were identified in the course of the project: (1) it was found difficult to develop a realistic business plan, since the market yet lacks proper financial instruments to leverage informal care and on-demand professional care; (2) it was found difficult to develop a workable solution for the seniors themselves, since even a well-designed mobile app was found difficult to use for seniors with MCI; (3) there was a challenge in expectation management towards end users in terms of numbers of participants vs. resources, and ready-for-market results.

3 B. PROJECT RESULTS – BUSINESS MODELS & INDICATORS

Please insert here a short summary of the **business model** selected for your product/service (max. ½ page). If not explained in the publishable summary section, please describe:

The MyGuardian system has been designed to cater for seniors on the move and is at its best when combining informal and formal caregivers on the receiving end of the calls for action or scheduling of tasks. The delivery of the holistic service implies a comprehensive supply chain, from technology platform, through algorithms management, to assistance services provision. The business members of the consortium ("MGB", for "MyGuardian Business members") are set to keep control of the software operations, while subcontracting the cloud services and partnering with existing care service providers and suppliers of GPS devices for seniors to go to market. The care service providers are most likely to be the existing call centers or domiciliary care organizations. Hence, MyGuardian's go-to-market model is a Business-to-Business model, whereby the care organizations and GPS specialists are the customers of MGB. MGB's sales and marketing efforts will be focused on these players ("push"), while keeping a fair level of Public Relation activity to create a "pull" for the product from informal caregivers.

MGB is confident that the 2 major innovations developed for MyGuardian can be leveraged as Unique Selling Propositions ("USPs").

1. Geo-fencing features allow a high level of accuracy and zones of any shape, not just a radius and a central point. And more importantly, MyGuardian can monitor specific behaviors in specific zones before ruling these as a risk or not, rather than simply marking 'forbidden' zones like existing solutions offer.
2. A private social media platform dedicated to the senior and a circle of her/his informal and formal caregivers allows a much tighter coordination between the professional and the voluntary assistance. It lightens the workload of the formal care givers and decreases the costs for the user, the family and third-party payers.

MGB's will invoice the care organizations that include the MyGuardian system in their offering. They in turn will invoice the user, the family or the health insurance supporting them. After benchmarking of services targeting the same market segment, MGB estimates that the service provider will be in position to charge EUR 3.00-5.00/ months to their users. MGB will charge EUR 2.00-2.50 per user per month to their care organization customers.

After a pre-commercialization phase of 18 months at the end of the project, MGB plans to expand in 3 stages of 2 years each. It will focus first in the home markets of the consortium members, while preparing in parallel the launch in the most active telecare markets in Europe: UK and Germany. On year 3, MyGuardian will be introduced into these 2 countries and at the same time MGB will start working on partnerships in the rest of Europe, for launch 2 years later. In doing so, it will expand from 16.000 users at the end of commercial year 2 to 80.000 3 years later. [More details could be found in D26. Business models and exploitation plan]

Please answer the questions below, if possible:

What is the targeted range of manufacturing/service costs per product/service unit (€, € per month etc.)?	1.25 EUR / PERS / MTH
What is the estimated size of the targeted market in Europe for your product/service (in €)?	44.2 M EUR / YEAR
In your business model, who will pay for the product/service (you can tick more than one box): – End user (older person) ☒ Informal carers – Formal care providers ☒ Public subsidies ☒ Insurance –Other (add if necessary) – not yet decided	
In your business model, who will take the decision about purchase of the product/service (you can tick more than one box): – End user (older person) ☒ Informal carers/family ☒ Formal care providers – Public subsidies ☒ Insurance –Other (add if necessary) – not yet decided	
At what stage of development are you with your product/service (e.g. research, pilot, real life trial etc.)?	Real-Life Trial with pre-commercial release
When will your product/service be ready for market ?	End 2016
What type of further research/development is necessary to finalize the product (technical, adoption, market research etc.)?	1) API and compatibility with relevant hardware platforms 2) Ergonomics - Usability 3) Contribution to project CoME, under AAL-7
What further investments are necessary to launch product on the market?	1) Evidence collection 2) Development of partnerships 3) Fine-tuning for market
Which is the expected turnover to be generated by your product/service in 2-3 years?	24 months after launch: 40 K EUR / YR
Please insert here any other information related to the business model, such as: The target market niche consists of seniors with MCI, which MyGuardian will approach through care organizations. MyGuardian needs no certification for reaching the market beyond normal data privacy governance. Regarding reliability testing, these have been already started during the project execution with the end user trials; and they'll carry on as the product is updated.	

3 C. PROJECT RESULTS – END USER INDICATORS

In the section below, please provide the information you have gathered during your project on **primary, secondary and tertiary end-users¹** of your product/service. Note that secondary end-users can be formal and informal careers (see footnote). For the indicators cited below, please provide information if available; any other qualitative or quantitative information on beneficiaries can be provided instead.

Type of end-user (primary, formal and informal secondary, tertiary end-users)

Data for all countries & end-users partners

- Requirements analysis: primary and informal secondary were interviewed, formal secondary and tertiary participated to brainstorming sessions (see deliverable D6)
- User acceptance tests (preliminary and final tests): primary, informal and formal secondary were implied in the tests (see deliverables D22 and D23)

Total number of end-users involved (by type of end-user, gender, etc.)

The total number of end-users participating in the 3 different phases (requirements analysis, preliminary user acceptance tests and final user acceptance test) was 211 with the following distribution:

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	54	71	42	40	3	1

In the following subsections the data are categorized by phases and countries.

Requirements analysis

Data for all countries & end-users partners

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	7	8	20	24	3	1

Total number of end-users involved for the requirements analysis: 63

For the requirements analysis, Dutch and Spanish partners followed the same methodology. Due to ethical approval delay, French partner begin the requirements analysis later, with a methodology validating and completing the requirements identified by the two others partners, as explained in deliverable D6.

1 Definition of end-users in AAL Joint Programme:

- *Primary end-user is the person who is actually using an AAL product or service, a single individual, "the well-being person". This group directly benefits from AAL by increased quality of life.*
- *Secondary end-users are persons or organisations directly being in contact with a primary end-user, such as formal and informal care persons, family members, friends, neighbours, care organisations and their representatives. This group benefits from AAL directly when using AAL products and services (at a primary end-user's home or remote) and indirectly when the care needs of primary end-users are reduced.*
- *Tertiary end-users are such institutions and private or public organisations that are not directly in contact with AAL products and services, but who somehow contribute in organizing, paying or enabling them. This group includes the public sector service organizers, social security systems, insurance companies. Common to these is that their benefit from AAL comes from increased efficiency and effectiveness which result in saving expenses or by not having to increase expenses in the mid and long term.*

Data for France/AGIM

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	1	2	5	5	3	1

Data for Netherlands/Careyn

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	4	4	10	14		

Data for Spain/Cetiex

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	2	2	5	5		

Preliminary user acceptance tests

Preliminary user acceptance tests were conducted in the Netherlands and in France only. Methodology used was face-to-face meetings for the Dutch partner and mainly online surveys for the French one. It explains why more participants were recruited in France, considering that the participants are here elders (> 65) with no cognitive impairments (potential primary or secondary end-users) as this approach is usual to evaluate basic usability issues. See deliverable D23 for more details.

Data for all countries & end-users partners

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	36	42	6	3		

Total number of end-users for the preliminary user acceptance tests: 87

Data for France/AGIM

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number	36	42				

Data for Netherlands/Careyn

	Primary		Secondary		Tertiary	
Gender	M	F	M	F	M	F
Number			6	3		

Final user acceptance tests

For the final user acceptance tests, the three end-users partners followed the same protocol. Nevertheless, the Spanish partners organized encounters with large groups of users (around 10 end-users), as the French and Dutch ones organized encounters with dyads of users (i.e. one primary and one or two secondary). As a result, more participants were recruited in Spain but the mass of information the

	consortium got in each country is quite similar. Indeed, participants are more likely to give their comments when the size of the group is more limited. Here primary users are people with cognitive impairments. Data for all countries & end-users partners <table><tr><td></td><td colspan="2">Primary</td><td colspan="2">Secondary</td><td colspan="2">Tertiary</td></tr><tr><td>Gender</td><td>M</td><td>F</td><td>M</td><td>F</td><td>M</td><td>F</td></tr><tr><td>Number</td><td>11</td><td>21</td><td>16</td><td>13</td><td></td><td></td></tr></table> Total number of end-users for the final user acceptance tests: 61 Data for France/AGIM <table><tr><td></td><td colspan="2">Primary</td><td colspan="2">Secondary</td><td colspan="2">Tertiary</td></tr><tr><td>Gender</td><td>M</td><td>F</td><td>M</td><td>F</td><td>M</td><td>F</td></tr><tr><td>Number</td><td>1</td><td>2</td><td>4</td><td>1</td><td></td><td></td></tr></table> Total for AGIM: 8 Data for Netherlands/Careyn <table><tr><td></td><td colspan="2">Primary</td><td colspan="2">Secondary</td><td colspan="2">Tertiary</td></tr><tr><td>Gender</td><td>M</td><td>F</td><td>M</td><td>F</td><td>M</td><td>F</td></tr><tr><td>Number</td><td>0</td><td>3</td><td>3</td><td>3</td><td></td><td></td></tr></table> Total for Careyn: 9 Data for Spain/Cetiex <table><tr><td></td><td colspan="2">Primary</td><td colspan="2">Secondary</td><td colspan="2">Tertiary</td></tr><tr><td>Gender</td><td>M</td><td>F</td><td>M</td><td>F</td><td>M</td><td>F</td></tr><tr><td>Number</td><td>10</td><td>16</td><td>9</td><td>9</td><td></td><td></td></tr></table> Total for Cetiex: 44								Primary		Secondary		Tertiary		Gender	M	F	M	F	M	F	Number	11	21	16	13				Primary		Secondary		Tertiary		Gender	M	F	M	F	M	F	Number	1	2	4	1				Primary		Secondary		Tertiary		Gender	M	F	M	F	M	F	Number	0	3	3	3				Primary		Secondary		Tertiary		Gender	M	F	M	F	M	F	Number	10	16	9	9		
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Average age and age distribution of involved end-users	Data are given for all end-users partners, as no significant difference was observed between countries regarding the average age of the participants. This information is available only for primary and informal secondary caregivers, as it was not asked to formal caregivers. The distribution is provided for the final user acceptance tests. <u>Requirements analysis</u> <table><tr><td></td><td>Primary</td><td>Informal Secondary</td></tr><tr><td>Mean Age</td><td>72</td><td>63</td></tr></table> <u>Preliminary user tests</u> <table><tr><td></td><td>Primary</td><td>Secondary</td></tr><tr><td>Mean Age</td><td>70</td><td>Data not available, done with formal caregivers only</td></tr></table> <u>Final user tests</u> <table><tr><td></td><td>Primary</td><td>Informal</td></tr></table>								Primary	Informal Secondary	Mean Age	72	63		Primary	Secondary	Mean Age	70	Data not available, done with formal caregivers only		Primary	Informal																																																																					
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			Secondary			
	Mean Age	72	52			
	Primary/Age distribution	< 65	65-69	70-74	75-79	>= 80
		6%	4%	16%	28%	46%
	Secondary /Age distribution	< 65	65-69	70-74	75-79	>= 80
		75%	8%		12%	5%
Location of end-user (rural, town, large city, etc.)						
	France					
	Rurals	80% of the participants are from Haute-Savoie French department, which is globally a rural department with small cities (< 10 000 inhabitants). AGIM has an office in this department.				
	City-dwellers	20% of the participants are from the city of Grenoble (main city of the Isère French department, > 100 000 inhabitants). AGIM main office is in Grenoble (University of Grenoble).				
	Spain					
	Rurals	100% of the participants belong to the population of Zafra and Los Santos de Maimona, from the province of Badajoz, where is located Cetiex.				
	City-dwellers					
	Netherlands					
Rurals						
City-dwellers	100% of the participants are from the city of Delft (> 100 000 inhabitants), where is located Careyn and its sub-contractor for the user studies (Delft University of Technology)					
Situation of end-users (single household, family setting, independence, etc.)						
	France					
	Family setting	90% of the participants where living with their family (consort or children)				
	Single household	10% of the participants where living alone, but in the same city as their children				
	Spain					
	Family	34,5% of the participants where living with				

	setting	their family (consort or children)
	Single household	20,7% of the participants where living alone, but in the same city as their IC
	Nursing home	44.8% of the participants where living in nursing home, but in the same city as their IC
	Netherlands	
	Family setting	Of the seniors and informal caregivers which participated in the research 86% were living with their family (spouse and/or children) This is logical as for two of the three seniors which participated in the research the informal caregiver is their spouse.
	Single household	14% of the participants where living alone, but in the same city as their children
Health status (disabilities, mobility, cognitive function, etc.)	- In France, 100% of the senior participating to the user requirements phase and the final user tests one were diagnosed with MCI (Mild Cognitive Impairments) by geriatricians that AGIM worked with for their inclusion. For the primary user tests, elderly people (> 65) were recruited online and should have no cognitive impairments. - In Spain, 100% of the senior participants had some form of disability, 21 had MCI, 5 rather important impairments (clear difficulties in daily life activities) and 4 with dementia (important need for caregivers' help) - In the Netherlands, 100% of the seniors were from Careyn care network, meaning that their cognitive profile fits with Careyn MCI Framework. In conclusion, the standard cognitive profile of MyGuardian seniors (requirements analysis and final user tests) is mild to moderate cognitive impairments (mainly memory and executive deficiencies). No seniors with severe cognitive impairments were recruited, as MyGuardian services are not dedicated to this population. Elderly people with no cognitive impairments were also recruited for the primary user tests, to get some feedback regarding the usability issues of MyGuardian applications. This approach is well known and efficient, as if this population cannot use the applications easily, it will be even worse for elderly people with cognitive impairments.	
Socio-economic background (education, income class, etc.)	Socio-economic background of the end-users is available only for the preliminary and the final user acceptance tests (using the International Standard Classification of Occupations), as this data was part of the protocols for analysis purposes (see deliverable D23 and D24). It was not asked for the requirements analysis, and obviously it is not provided for formal caregivers.	

	Primary Informal secondary Managers 46% Professionals 7% Technicians 3% Clerical Service/sales workers 8% Agriculture 1% Craft Operators 7% Elementary 7% Armed forces Unknown 21% Primary Informal secondary Managers 9% 14% Professionals 6% 10% Technicians 23% Clerical 16% 17% Service/sales workers 12% 17% Agriculture 4% Craft 9% 5% Operators Elementary 38% 14% Armed forces 6%
Total number of end-users effectively using the AAL solution beyond the project implementation period	The objective of MyGuardian was to develop, deliver and test prototypes that are in accordance with the end-users requirements. Thanks to the results of the final tests, the final prototype will be improved to deliver the first stable MyGuardian product, but this objective will be reached after the end of the project, as initially planned. As a result, at the end date of the project, the number of end-users that will use effectively MyGuardian beyond the project is not known.
Any other information	Methodology MyGuardian development is user centered. Iterations were done to integrate the end-users point of view in the process, from the user requirements gathering to the final prototype evaluation. From a methodological point of view, techniques like participatory design (see deliverable D6) were used to maximize the end-users integration. For the final tests, a game was for example developed to maximize the appropriation of the functionalities (see deliverable D23). The overall methodological approach is at the cutting-edge of the user-

	centered approaches developed in the field of ambient assistive living and assistive technologies. <u>Recruitment of end-users</u> Part of the recruitment and inclusion process was done with formal caregivers (e.g., geriatricians), as evaluating the cognitive profile of seniors has to be done by experts. <u>Users involvement all along the project</u> Users involvement all along the project differs from country, i.e. for the all the end-user studies phases (user requirements analysis, primary and final user tests). This is a consequence of the age and cognitive profile of the participants that usually progress to more severe impairments. For example, in France, only 1 dyad was involved during the whole project (7 dyads were involved in all), while in Spain all the users were involved in the different phases, 14 users involved in the requirements analysis were also involved in the final user acceptance test.
Please describe here the principles applied and procedures followed in handling ethical issues such as ethics towards technology use, to privacy, data management, ethical considerations regarding human-robot interaction, exit strategy, etc. <i>General considerations regarding ethical issues can be found in deliverable D8.</i> <u>Informed consent</u> To involve the end-users, all the end-users partners used the same approach all along the project. A template was provided for the notice of information and the consent form that was translated in French, Spanish and Dutch. <u>Protocols</u> All the information regarding the protocols used to work with the end-users can be found in the deliverables (D6, D22, D23) and will not be summarize here, considering their richness. Legal procedures were followed, with respect to the national ethical frameworks. <u>Privacy</u> As a consequence, privacy was ensured with the anonymisation of all the end-users data. No medical and critical data were processed during the project. Some of the interviews were videotaped or voice recorded with the participant consent, but it was only for analysis purposes and all the material was destroyed after. <u>Exit strategy</u> It was clearly explained to all the participants that their participation was free and that they could stop participating at all time with no consequences, as mentioned in the notices of information (see for example deliverable D23) and explained to them when gathering their informed consent. <u>Incentive</u> No material incentive was proposed to participants. All expenses were covered (in particular, regarding their	

conveyance to the end-users partners offices).

Harms

As MyGuardian services are prototypes, participants never used alone the technology to avoid any troubles due to technological reliability issues.

3 D. PROJECT RESULTS – OTHER INDICATORS

Patents , which are the direct result of the project work	NONE
Other Intellectual Property Rights (IPR) resulting from the project work	IPR include foreground property right applied to specific software components developed along the project by technical partners, as follows: • Privacy and data security module (UNIGE, c.f. D11) • User profiling module (HIB, c.f., D12) • Localization module (UNIGE, c.f., D13) • Knowledge Discovery Module (HIB, c.f., D14) • Contextual information generation module (HIB, c.f., D15) • Communication and Coordination module (CON, c.f., D16) • State Assessment module (UNIGE, c.f., D17)
Collaboration to standards , which are the direct result from the project work	UNIGE: International Telecommunication Union (ITU) European Regional Initiative for mHealth and 2) IEEE Location Services (LS) for Healthcare Working Group
Publications (scientific or other) , which are the direct result from the project work (please provide details)	There are 24 scientific publications, please see the D25 for the details of dissemination activities. Katarzyna Wac, Maddalena Fiordelli, Mattia Gustarini, Homero Rivas, Quality of Life Technologies: Experiences from the Field and Key Research Challenges, IEEE Internet Computing, Special Issue: Personalized Digital Health, July/August 2015. Marios Fanourakis, Katarzyna Wac, ReNLoc: An Anchor-Free Localization Algorithm for Indirect Ranging, IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (IEEE WoWMoM 2015), Boston, USA, June 2015. Katarzyna Wac, Gerardo Pinar, Mattia Gustarini, Jerome Marchanoff, Smartphone Users' Mobile Network's Quality Provision and VoLTE Intend: Six-months Field Study, IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (IEEE WoWMoM 2015), Boston, USA, June 2015. Matteo Ciman, Katarzyna Wac, Ombretta Gaggi, iSenseStress: Assessing Stress Through Human-Smartphone Interaction Analysis, 9th International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth), Istanbul, Turkey, May 2015. Mattia Gustarini, Jerome Marchanoff, Marios Fanourakis, Christiana Tsiourti,

Katarzyna Wac, UnCrowdTPG: Assuring the Experience of Public Transportation Users, 2nd IEEE International Workshop on Smart City and Ubiquitous Computing Applications (SCUCA'14), co-located with the IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (IEEE WiMob 2014), Larnaca, Cyprus, October 2014.

Pawel Swiatek, Maria Martini, Katarzyna Wac, Kevin Patrick, Guest Editorial Service Science for e-Health, IEEE Journal on Biomedical and Health Informatics, 18(5): 1515-1517, September 2014.

Vincent Rialle, "Unified perception of technology, ethics, and Silver economy: plea for a new rationale of ICT-based services for a worldwide aging society". European Files. 2014, 33: pp.42-3, July 2014.

Katarzyna Wac, Christiana Tsiouri, Ambulatory Assessment of Affect: Survey of Sensor Systems for Monitoring of Autonomic Nervous System's Activation in Emotion, IEEE Transactions on Affective Computing, Special Issue: Technologies for Affect and Wellbeing, 5(3): 251-272, June 2014.

Christiana Tsiouri, Emilie Joly, Maher Ben Moussa, Cindy Wings-Kolgen, Katarzyna Wac, Virtual Assistive Companion for Older Adults: Field Study and Design Implications, 8th International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth), Oldenburg, Germany, May 2014.

Katarzyna Wac, Beat by Beat Getting Fit: Leveraging Pervasive Self-tracking of Heart Rate in Self-management of Health. Association for the Advancement of Artificial Intelligence (AAAI) Spring Symposium, Track on Big Data Becomes Personal: Knowledge Into Meaning, Stanford University, USA, March 2014.

Jeremy Bauchet and Vincent Rialle, "Coping strategies as inspiration for the design of assistive technologies for cognition: an exploratory study", short paper at the 9th World Conference of Gerontechnology (ISG 2014), Taipei, Taiwan, June 10-21, 2014.

Jeremy Bauchet and Vincent Rialle, "De la créativité des personnes âgées à celles des technologues : la conception participative d'une technologie d'assistance pour la cognition". Poster présenté au 10ème Congrès International Francophone de Gériatrie et de Gérontologie (CIFGG), Liège, Belgique, May 14-16, 2014.

Mattia Gustarini, Katarzyna Wac, Smartphone Interactions Change for Different Intimacy Contexts, Fifth International Conference on Mobile Computing, Applications and Services (MobiCASE), Paris, France, November 2013.

Christiana Tsiouri, Katarzyna Wac, Towards Smartphone-based Assessment of Burnout (Work in Progress), Fifth International Conference on Mobile Computing, Applications and Services (MobiCASE), Paris, France, November 2013.

Selim Ickin, Katarzyna Wac, Markus Fiedler, Quality of Experience-Based Energy Reduction by Controlling the 3G Cellular Data Traffic on the Smartphone, 22nd International Teletraffic Congress Specialist Seminar on Energy Efficient and Green Networking (22 ITC SSEGN), co-located with the ATNAC, Christchurch, New Zealand, November 2013.

Jeremy Bauchet, Leïticia Courbet and Vincent Rialle "De la stratégie humaine à la stratégie technologique: des défis du développement des technologies

	pour l'autonomie". Poster présenté lors des Journées Annuelles de la Société Française de Gériatrie et Gérontologie, Paris, Octobre 2013. Les cahiers de l'année gérontologique, 5(1-2), p176 Mattia Gustarini, Selim Ickin, Katarzyna Wac, Evaluation of Challenges in Human Subject Studies "In-the-Wild" Using Subjects' Personal Smartphones, International Workshop on Ubiquitous Mobile Instrumentation (UbiMI), co-located with the UBICOMP conference, Zurich, Switzerland, September 2013. Katarzyna Wac, Muhammad Ullah, From Mobile Cognition to Cognitive Mobility: QoS-aware, Mobile Healthcare Services, chapter in: Human Aspects in Ambient Intelligence, Ambient and Pervasive Intelligence Book Series, Bosse, T., Cook, D.J., Neerincx, M., Sadri, F. (Eds.), Atlantis Press, September 2013. Katarzyna Wac, Smartphone Based Ambulatory Assessment of Health Risks: Literature Review, Poster at Society for Ambulatory Assessment 2013 Conference (SAA 2013), Amsterdam, the Netherlands, June 2013. Vincent Raille, Jérémy Bauchet, "Le rôle de l'utilisateur dans les projets en gérontechnologie: l'éthique comme facteur de succès" International Symposium on Ethics, Strasbourg, April 2013 (under submission). Katarzyna Wac, Smartphone as a Personal, Pervasive Health Informatics Services Platform: Literature Review, IMIA Yearbook 2012: Personal Health Informatics, 7(1), pp.83-93. Mattia Gustarini, Katarzyna Wac, Ubiquitous Inference of Mobility State of Human Custodian in People-Centric Context Sensing, International Workshop on Ubiquitous Mobile Instrumentation (UbiMI), co-located with the UBICOMP conference, Pittsburgh, PA, USA, September 2012. Sokratis Bampounakis, Katarzyna Wac, Deriving Connectivity and Application Usage Patterns From Longitudinal Mobile Phone Usage Data, Mobile Data Challenge by Nokia Workshop, co-located with the PERVASIVE Conference, Newcastle, UK, June 2012. Mattia Gustarini, Katarzyna Wac, Estimating People Perception of Intimacy in Daily Life from Context Data Collected with Their Mobile Phone, Mobile Data Challenge by Nokia Workshop, co-located with the PERVASIVE Conference, Newcastle, UK, June 2012.
Other dissemination activities	• Project website (1200+views, 1000 unique visitors); Project participants websites • Project Press release (by HIB) and technical meetings • Online press: 20+ articles • Facebook, Twitter, YouTube (2000 followers) • Project Leaflets (ES, ENG, FR) • AAL Forum: 2012, 2013, 2014, 3 AAL related events, 3 national AAL events • Three scientific workshop events (AGIM and UNIGE) • 30 Scientific talks • Contribution to teaching: courses, tutorials, theses (AGIM, CON, UNIGE) • Commercial Dissemination and Visibility: Meeting

	end-users: 7 exhibitions/events by HIB/CON/CETIEX/VIGS/AGIM, 100+ user meetings Liaison with four other research projects (EU, AAL) Note: c.f. D25 for the details of dissemination activities
Type and size of audience reached by dissemination activities	- Primary end-users Web, social media, meetings/events by AGIM, CON, CAR, VIGS, CETIEX: 3000 persons - Secondary users Web, social media, meetings/events by AGIM, CON, CAR, VIGS, CETIEX, HIB: 7000 persons - Tertiary users, society at large Web, meetings/events by AGIM, CON, CAR, VIGS, CETIEX, HIB, UNIGE: 10000+ persons TOTAL: 20'000+ persons
Technology transfer agreements and/or any other business deals achieved	NONE
Spin-off/s set up	UNIGE: MobileThinking.ch (launched in October 2014), start-up focusing on cutting-edge research, development and consultancy IT services. CAREYN: Innovative Nurses Office (to be launched Sep 2015), an organization for home care, nursing care, social services and more.
Number of jobs created	UNIGE: 2 persons 100% (co-sponsored by COST Action STSM), person 1: 3 months contract, person 2: 6 months contract both positions: PhD Internship in the QoL laboratory VIGISENSE: 1 person 50%, 2 years contract, position: Sales Manager AGIM: 1 person 100%, 3 years contract, position: Emerging Project Management

4. FINANCIAL INFORMATION - OTHER COMMENTS

Please check appropriate box:

The financial part of the project ☒ is in line with (or) ☐ deviates from the partner's Grant Agreements & Work Packages plans (personal efforts, other costs, etc.)?

In case of deviation, please give a short explanation:

No deviations were detected.

Other comments related to financial part of the project:

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5. AAL JP PROGRAMME

Please comment, using your AAL project experience, on the main advantages and disadvantages of AALJP projects.

Main advantages are in the dimension of the consortium (3-7 partners): this ensures manageability and guarantees better and more consistent final results. The inclusion of different countries also ensures a better and wider dissemination activity and a better focus on business exploitation.

Disadvantages are mainly in the decentralized management of the financial aspects of AAL projects.