FINAL
PROJECT REPORT

– Template –

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	27/04/215

PUBLISHABLE PROJECT INFORMATION (TO BE USED BY AALJP)

1A. PROJECT	
Project full title	ENabling elderly people TRAvel and iNternet access
Project acronym	ENTRANCE
Project No.	AAL-2010-3-108
Project Website	www.entrance.fr
Project duration	•Starting date: 01/09/2011 •Termination date: 28/02/2015
Coordinator's name and details	Full name: Margarita Anastassova E-mail address: margarita.anastassova@cea.fr Telephone number: +33 1 69 08 02 20

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.)	Commisariat à l'énergie atomique et aux énergies alternatives	CEA	RTD	541 069	541 069
2	Paris Lodron University of Salzburg	PLUS	RTD	266 368	88 789
3	Autonom'Lab	ALab	*END USER*	90 107	90 107
4	50Plus GmbH	50+	*END USER*	90 060	60 040
5	Geomobile GmbH	GM	SME	536 784	215 825
6	GFTH Ltd.	GFTH	SME	102 750	97 250
7	Idées-3com	I3Com	SME	314 383	382 246
8	Splitted-Desktop Systems	SDS	SME	260 000	318 000
**Please select one of these options: SMEs, Large, END USER, RTD, other*					

1C. PUBLISHABLE PROJECT RESULTS SUMMARY *(1 PAGE)*

Information access is steadily shifted to online platforms. However, only half of the citizens older than 50 years are using Internet. Compared to younger adults, older adults are less likely to use digital services, such as applications for purchasing e-tickets and booking vacation packages, since they usually have less experience with interactive technologies, do not always see the benefit of using them or do not trust them. Another problem often encountered by older adults is difficulties in wayfinding both outdoors and in large indoor environments (e.g. airports, museums) due to the decline in memory for geometric patterns and landmarks location, and poorer configurational representations.

The ENTRANCE project proposed a demonstrator of an innovative integrated platform to address these two problems. The platform comprises:

- ***a home terminal with a serious game for acquiring preliminary knowledge on orientation in complex buildings;***
- ***a multimodal mobile interface for navigation and wayfinding.***

The home terminal includes a silent computer to be used in living rooms and software adapting to users with different levels of technology proficiency. In the demonstrator, the software is used to learn how to plan a trip and transfer it to the mobile interface. In the future, other service applications could be added based on the "App Store" principle. As mentioned above, the ENTRANCE demonstrator also comprises a serious game, which is meant to be used by older adults to improve their spatial competence and, subsequently, their ability to navigate indoors and outdoors. The mobile platform, usable on the move, comprises navigation software, which is also used in the serious game on the home platform. This navigation software is installed on a smartphone, and combined with outdoors and indoors positioning system, and a haptic navigation device (e.g. a vibrotactile wristband) for giving directions, and informational messages during navigation.

The innovative elements of ENTRANCE are the following:

- ***a home platform usable for both trip planning and indoor/outdoor navigation training;***
- ***a multimodal navigation interface comprising a navigation application, a vibrotactile wristband and software for vibrotactile pattern creation.***

The following ENTRANCE technologies have the highest marketing potential: 1) the mobile application with the software for itinerary planning; 2) the home platform; 3) the vibrotactile wristband and the software for vibrotactile pattern creation. The target customers are both older and younger adults. The exploitation of these technologies, which started during the project with preliminary contacts with potential clients, will continue after its end. We expect an immediate commercialisation of the mobile application, the software for itinerary planning and the home platform. As for the vibrotactile wristband and the associated software, we expect our contacts to be rapidly concretized (in a horizon of 1 to 2 years).

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.*

……

Has the project been finalised in line with the Description of Work?	**YES ☐**	**NO ☐**	**PARTLY X**
IN CASE OF DEVIATION*, PLEASE EXPLAIN:* A 6-MONTHS EXTENSION HAS BEEN AGREED WITH THE CMU AND THE NCPS. A NEW DOW HAS ALSO BEEN AGREED.			
Has the project achieved its expected results as described in the Description of Work?	**YES ☐**	**NO ☐**	**PARTLY X**
IN CASE OF DEVIATION*, PLEASE EXPLAIN:* THE RESULTS SPECIFIED IN THE NEW DOW HAVE BEEN PARTIALLY ACHIEVED. THUS, THE TECHNOLOGIES HAVE BEEN DEVELOPED. HOWEVER, THE USER STUDIES RESULTS SHOWED THAT THE SERIOUS GAME HAD PERSISTENT USABILITY PROBLEMS AND WAS NOT VERY WELL PERCEIVED BY FUTURE USERS. THESE NEGATIVE RESULTS MAY BE DUE, OF COURSE, TO THE USABILITY PROBLEMS, BUT ALSO TO OLDER ADULTS AS A TARGET. BASED ON THE MARKETING ANALYSIS CONDUCTED IN THE PROJECT, WE HAVE DOUBTS WHETHER OLDER ADULTS ARE THE RIGHT TARGET FOR SUCH KINDS OF SERIOUS GAMES. AS FAR AS BUSINESS RESULTS ARE CONCERNED, THERE ARE CLEAR EXPLOITATION OPPORTUNITIES FOR THE MOBILE NAVIGATION PLATFORM AND THE HOME PLATFORM. AS FOR THE SERIOUS GAME, THE BUSINESS OPPORTUNITIES ARE LESS CLEAR BECAUSE OF THE USABILITY PROBLEMS MENTIONED ABOVE AND BECAUSE I3COM REORIENTED ITS BUSINESS STRATEGY AND IS NOT DEVELOPING GAMES ANY MORE.			

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

WP1: Management and Business model: A marketing study, funded by ALAb, was done. Its results showed that the mobile platform (namely the software) had the highest marketing potential as far as older adults are concerned. The wearables were shown to have a potential if acceptability issues were fully resolved. The wearables were shown to also have a potential with other user groups (e.g.

sportsmen, isolated workers). The home platform was shown to have a marketing potential if used for the connections with family and for improving older adults' wellbeing. As for the serious game, no particular marketing potential was shown, probably due to its prototypical nature. Thus, the final business model of ENTRANCE, as well as further exploitation efforts, will be mainly focused on the technologies with the highest marketing potential. As far as the exploitation issues are concerned and after consultations with the IPR Department of CEA, a full list of own and common IPR and knowledge per partner will be agreed. In accordance with the consortium agreement and on the basis of this list, future exploitation agreements on bilateral or multilateral basis will be signed if some exploitation of common knowledge is actually done.

WP2: User Studies: A number of user evaluation studies were done, both in a laboratory and field setting. The evaluation was iterative, i.e., there were separate evaluations for different components, as they were developed consecutively (from mock-ups and design sketches to prototypes). For the development and evaluation, different methods were applied to investigate the value of the Entrance system. The concepts, guides and materials for the user studies were provided by PLUS or CEA, and adapted according to the project partners' feedback. The studies were then conducted by PLUS and 50plus in Austria or CEA and ALab in France. Afterwards, PLUS or CEA analysed the results and provided the evaluation reports. The results of the iterative evaluation formed the basis for the iteration and development of the Entrance system). The user studies results are presented in D2.3. The results show a gradual adaptation of the mobile platform to older adults' needs. However, the serious game presents persistent usability and acceptability problems.

WP3: Home Platform: A Home Platform comprising a fanless, powerful and small form factor computer and software with a dedicated user interface was developed and tested (froma technical point of view) by SDS. The software also contained French/German tutorials guiding users in the discovery of the software.

WP4: Mobile Platform: A mobile platform comprising a mobile application, a content management system, an indoor positioning system and vibrotactile wristband was developed by GM, GFTH and CEA. It was gradually improved with input from PLUS and the EUOS. The indoor positioning system proposed by GFTH did not fully satisfy the requirements of the project. For this reason, alternative indoor localisation solutions were explored. However, no completely functional solution was found during the duration of the project.

WP5: serious game: A serious game for improving older adults' spatial competences was developed by I3Com. However, it showed persistent usability and acceptability problems throughout the project. Furthermore, I3Com reoriented its business strategy and is not developing games any more. For these reasons, the game was not included in the final business model of the project.

3 B. PROJECT RESULTS – BUSINESS MODELS & INDICATORS

The ENTRANCE project proposed a demonstrator of an innovative integrated platform to address these two problems. The platform comprises: 1) a home terminal with a serious game for acquiring preliminary knowledge on orientation in complex buildings; 2) a multimodal mobile interface for navigation and wayfinding. The home terminal includes a silent computer to be used in living rooms and software adapting to users with different levels of technology proficiency. In the demonstrator, the software is used to learn how to plan a trip and transfer it to the mobile interface. In the future, other service applications could be added based on the "App Store" principle. As mentioned above, the ENTRANCE demonstrator also comprises a serious game, which is meant to be used by older adults

to improve their spatial competence and, subsequently, their ability to navigate indoors and outdoors. The mobile platform, usable on the move, comprises navigation software, which is also used in the serious game on the home platform. This navigation software is installed on a smartphone, and combined with outdoors and indoors positioning system, and a haptic navigation device (e.g. a vibrotactile wristband) for giving directions, and informational messages during navigation. *The following ENTRANCE technologies have the highest marketing potential: 1) the mobile application with the software for itinerary planning; 2) the home platform; 3) the vibrotactile wristband and the software for vibrotactile pattern creation. The target customers are both older and younger adults. The exploitation of these technologies, which started during the project with preliminary contacts with potential clients, will continue after its end. We expect an immediate commercialisation of the mobile application, the software for itinerary planning and the home platform. As for the vibrotactile wristband and the associated software, we expect our contacts to be rapidly concretized (in a horizon of 1 to 2 years).*
Please answer the questions below, if possible:

What is the **targeted range of manufacturing/service costs** per product/service unit (€, € per month etc.)?	Not completely defined yet since market size not completely clear
What is the **estimated size of the targeted market** in Europe for your product/service (in €)?	See above

In your business model, **who will pay** for the product/service (you can tick more than one box):

X End user (older person) X Informal carers ☐ Formal care providers ☐ Public subsidies

☐ Insurance X Other: service providers (e.g. shopping malls, museums)

☐ 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):

X End user (older person) X Informal carers/family ☐ Formal care providers ☐ Public subsidies

X Insurance X Other: service providers (e.g. shopping malls, museums)

☐ not yet decided

At what **stage of development** are you with your product/service (e.g. research, pilot, real life trial etc.)?	- Mobile application and content management system: real life trial - Indoor positioning system: real life trial - Hardware of the home platform: real life trial - Software of the home platform: pilot - Serious game: prototype - Vibrotactile wristband: research prototype - Software for vibrotactile pattern creation: pilot
When will your product/service be **ready for market**?	- Mobile application and content management system: ready - Indoor positioning system: ready

	- Hardware of the home platform: ready - Software of the home platform: in 3 months if interested clients - Serious game: no potential clients for the moment - Vibrotactile wristband: in 6 months to 1 year if interested industrial partners - Software for vibrotactile pattern creation: in 6 months if interested industrial partners
What type of **further research/development** is necessary to finalize the product (technical, adoption, market research etc.)?	- Software of the home platform: technical work, adoption, market research - Serious game: technical work, adoption, market research -Vibrotactile wristband: technical work, adoption, - Software for vibrotactile pattern creation: technical work
What **further investments** are necessary to launch product on the market?	Not completely clear yet
Which is the **expected turnover** to be generated by your product/service in 2-3 years?	Not completely clear yet

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-users[1] 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)	Two personas have been created to describe our primary end user group. • *George* is 65 years old and very technology affine and interested in the different possibilities technology offers. When George wants to learn how to use a technology, he primarily tries everything out. George has a portable navigation system (a Garmin), which he uses mainly while driving in unfamiliar outdoor environments and for planning routes. He sometimes also uses the navigation system on his smartphone, but he does not plan routes with it. • *Luise* is 70 years old and is rather interested in technologies and thinks that they could perhaps enrich her everyday life, she is critical of new technologies. In case Luise needs support in learning how to use a technology, she mainly asks her children, her friends, or her husband. Otherwise, she tries learning by doing or uses written step-by-step instructions with pictures, as she thinks that they are supportive. Luise has a portable navigation system (a TomTom), as well as one that is integrated in the car. She sometimes uses the navigation system while driving and for route planning. However, she prefers using a street map when going by car, as she does not want a prescription of where to go (rather "think by herself").
Total number of end-users involved (by type of end-user, gender, etc.)	*Requirements analysis* • 17 end user interviews, 29 participants in end user

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.*

	workshops, 82 participants in survey • 14 expert interviews *Evaluation* • George (12 participants in end user workshops, 20 participants in lab studies, 16 participants in field studies) • Luise (12 participants in end user workshops, 18 participants in lab studies, 10 participants in field studies) • Experts (3 participants in workshops, 5 participants 1st expert evaluation, 4 participants 2nd expert evaluation, 7 participants 3rd expert evaluation)
Average age and age distribution of involved end-users	*Requirements analysis* • End user: 50 to 83 years (average 67,11 years) • Experts: 33 to 73 years (average 53 years) *Evaluation* • End user: 53 to 80 years (average 66,57 years) • Experts: 26 to 72 years (average 37 years)
Location of end-user (rural, town, large city, etc.)	In Austria, the end users were living in or close to the city Salzburg. In France, the end users were living in villages around the city of Limoges (rural area).
Situation of end-users (single household, family setting, independence, etc.)	The end users were living independently at home (most recruited end users were married), there were no other specific requirements regarding living situations within this project.
Health status (disabilities, mobility, cognitive function, etc.)	In Austria, 2 end users had visual restrictions (e.g., Cataract). In France, end users were all in a good health, with no particular disabilities, mobility problems, or other impairments.
Socio-economic background (education, income class, etc.)	No specific socio-economic background was required within this project
Total number of end-users effectively using the AAL solution beyond the project implementation period	0 end users
Any other information	

Autonomy and privacy: Autonomy refers to the capacity of a rational individual to make an informed, un-coerced decision, while privacy is the ability of an individual or group to seclude themselves or information about themselves and thereby reveal themselves selectively. The technologies and applications developed in this project did not limit users' autonomy, as they were designed taking into account users' values and preferences. They partly require the use of personal information. For these reasons, autonomy and privacy issues were carefully considered during the design process. This was mainly done in the following ways:

1) Before each user test or inquiry, an informed consent form was presented to the test participant. It was describe the objectives of the study or the inquiry and the ways of handling private

information. It was explained to the participant that s/he was not in the obligation to answer the questions or do a task and that s/he can withdraw at any point of the test. If the participant agreed with the terms of the informed consent, s/he was asked to sign the form.

2) Test participants was also be made aware of all the information that was collected, stored and processed during the user studies and the system design. They had the right to refuse the use of information which they judge private or sensitive.

3) The test participant was also asked for permission to record data on video/audio tapes. It was possible to completely reject this, to allow it to be used within the project and to allow it to be shown/published to a wider audience (only if the faces are hidden by black rectangles). A separate informed consent form was signed for this material.

4) The researchers participating in the project took care to include questions about privacy and user acceptability of privacy violations into study designs.

5) Personal information (e.g., name, date of birth, address) were not available to persons outside the project, and were handled in a safe manner. It was handled according to the relevant laws in the countries involved.

6) All test results such as verbal protocols, videos, pictures, statistical results were anonymized (i.e., they did not contain personal information, only the age in years and reference to the persona).

7) During the interaction with the Internet services, participant's privacy was protected when necessary. Thus, e-mails were encrypted, and proxies and networks were anonymized. Similar measures were taken if user positioning violates privacy.

8) Final decisions were taken in informed discussions with future users and their formal and informal carers.

Dignity: Dignity is a term used in moral, ethical, and political discussions to signify that a being has an innate right to respect and ethical treatment. In order to assure this right:

1) The participants were not put in prejudicial situations during observations or group discussions, or any other user study.

2) Their dignity was respected and they had full freedom of expression when involved in user studies.

3) Also, the researchers in the project were very careful to explain the objectives of the study to the participants, to clarify what was expected from them and what the future technology would be used for.

4) Specific questions about users' values and ethics were included in interviews and incorporated in the design of the system.

5) When including formal or informal user carers in the design process, the researchers kept a neutral scientific position and did not judge or comment any personal issues, which arose.

6) At the end of each user study, the test results were presented to the users involved in the study (if interested) in order to confront the researchers' interpretations to the users' ones. In this way, unwanted solutions were avoided.

Integrity and security: Navigation in unknown environments (indoors or outdoors) may be dangerous. For this reason, safety issues were considered all along the test and system design processes. We put particular focus on safety issues during user studies, in a concrete navigational situation (WP2), and during the design of the system, in its part of trip planning (WPs 4 and 5). User overconfidence in the device was also considered.

Ethics: As already stated above, we strived to work closely with the future user group. To ensure this was done in an ethically acceptable way, effort was put in continuously and clearly informing users about the objective of the work, as well as their rights. Feedback from users on their experience of the

user studies was integrated iteratively. An informed consent procedure was used. We also made clear that the users may not personally benefit from the future technology. The reason for this clarification is to avoid too high expectations of test participants.

3 D. PROJECT RESULTS – OTHER INDICATORS	
Patents, which are the direct result of the project work	No patents
Other **Intellectual Property Rights** (IPR) resulting from the project work	No other IPR
Collaboration to **standards**, which are the direct result from the project work	No contribution to standards
Publications (scientific or other), which are the direct result from the project work (please provide details)	Publication at the AAL Forum, Eindhoven (2012) Presentation during the "Open Days" of ALAB Publication at the AAL Forum, Norrköping (2013) Publication at IEEE Worldhaptics (2013) Demonstration at IEEE Worldhaptics (2013) Publication at ACM ECCE (2013) Publication at the 2014 ACM CHI Conference Publication at the 28th International Congress of Applied Psychology (2014) Publication at the 14th European Congress of Psychology (2015) Publication accepted at IEEE WorldHaptics (2015)
Other **dissemination activities**	10 ICT&S Center (University of Salzburg) newsletter contributions 50+ : District Conferences – (Flachgau, Pinzgau, Pongau, Tennengau, Lungau) 50plus magazine (5 time the year) Europatag project presentation Information on the vibrotactile wristband in Future Magazine, Arte (http://www.futuremag.fr/)
Type and size of audience reached by dissemination activities	From 300 to 3000 people TV presentation: larger audience
Technology transfer agreements and/or any other **business deals** achieved	No technology transfer agreements
Spin-off/s set up	No spin-offs
Number of **jobs** created	3

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:

ALAB did not spend the whole budget it asked for.

As it was the first time Alab participated in AAL project, the budget has been overvalued in term of human resources effort and operations costs. Alab didn't have enough visibility on users mobilization and actions planned in the beginning resulted not necessary afterwards or far less expensive than foreseen. Moreover the organization changed his governance and the person in charge of the project several times during the reported period and this had an impact on the project management.

Other comments related to financial part of the project:

……

5. AAL JP PROGRAMME

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

……