Empathize with the CAPTAIN Stakeholders' Community towards Understanding Older Adults' Daily Needs and How They Cope with Them

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Abstract: This paper presents the results of the first part of the design thinking approach that was utilized within the CAPTAIN H2020 funded project. CAPTAIN aims at developing a new technology to help older adults living at home, by designing new technology that turns the home of older adults into a ubiquitous assistant. Six personas were selected for the empathize session which was conducted through plenary face–to-face open discussion meeting. 33 older adults and caregivers participated. The goal of this study was to identify the everyday difficulties that older adults face and clarify the means they are currently using to address these problems. The paper presents the approach, the design of the first session and the results from the Greek pilot site.

1 INTRODUCTION

According to a Center for Disease Control study by the State of Aging and Health in America (Centers for Disease Control and Prevention, 2013), 64% of surveyed American older adults want to live in their own homes. These figures are consistent with the preferences of the European population. However, they often need to be institutionalized due to age-related problems. This might have negative impact on different aspects of person's life such as depression, lower quality of life, social isolation and has also been linked with high mortality rates (Yang and Ornstein, 2015).

The use of technology has demonstrated compelling evidence as a means of supporting aging at home (Reeder *et al.*, 2013). A wide range of technologies for homecare scenarios for older adults have been developed including but not limited to enhancing self-management of chronic conditions (García-Lizana and Sarría-Santamera, 2007), objective frailty assessment (Schwenk *et al.*, 2015), fall detection and prevention (Chaudhuri, Thompson and Demiris, 2014) and assistance in overcoming social isolation (Chen and Schulz, 2016).

In this context, the H2020 funded project, CAPTAIN (Coach Assistant via Projected and Tangible Interface, [www.captain-eu.org]), aims at developing a new technology to help older adults living at home. CAPTAIN will develop a new technology designed to turn the home of older adults into a ubiquitous assistant. The produced system makes use of projected augmented reality and real-time 3D sensing technologies to monitor and "comprehend" the user and the indoor space in order to provide contextualized and personalized coaching and instructions. Solutions will be designed for non-invasive user and environmental sensing including

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emotional and behavioral recognition, indoor location and gait analysis, physical and cognitive training progress monitoring. Exploiting this information, CAPTAIN will develop behaviour and AI algorithms which will allow the system to provide personalised advice, guidance and follow-up for key age-related issues in daily life which impact the person's ability to remain active and independent at their home. This will include risk avoidance, nutrition guidance, physical activity and cognitive training follow-up, guidance for lifestyle and social participation. One of the research question CAPTAIN is expected to answer is how effectively can machine learning techniques predict older adult's profile and provide behavioral guidance.

CAPTAIN has to deal also with the system's usability and acceptability. To this end, CAPTAIN consortium has built an engagement and dissemination plan in order to create a community of stakeholders with strong support bonds to stay active throughout the whole project. The so called CAPTAIN community is the only official source of requirements. While the multidisciplinary team of CAPTAIN will suggest requirements, it will be up to the active stakeholders' network to decide their adoption or not. The question raised is how to build and maintain a network of stakeholders while gather information that will assist on enhancing system's usability and acceptability.

CAPTAIN has adopted a fully user-centered, participatory design approach based on agile principles for technology development. Throughout the project a combination of Design Thinking, Lean Startup and Agile methods is applied. Design Thinking (Plattner, Meinel and Leifer, 2011)is a highly approved method for exploring the so called wicked problems, which are complex problems not adequately defined. Designers using the Design Thinking method are also willing to redefine the problem and investigate the frame that guides to the solution. The Lean Startup method (Ries, 2011)allows the design team to rapidly define and build the right things. The Build–Measure–Learn loop encapsulates the core idea of the Lean Startup methodology and emphasizes speed as a critical ingredient to development. Based on the output of the Design Thinking the team defines what they are going to Build, followed by measuring the end-users reactions and behaviors against the delivered system and Learn from that in order to start Building again. The Agile method aims to define how to build the things right. In systems like CAPTAIN that are complex, innovative and last for about 3 years, the traditional software development methods are not effective. Stable plans and accurate definition of the components at the beginning are hard to get and might not be needed. Agile development is based on an iterative definition and implementation of small functional parts of the whole system. At the end of every iteration a working increment of the system and validate its value.

In this work we explore the engagement of end-users in the design process at an early stage of the system. It is mostly an exploratory work on older adults every day habits and problems.

2 RELATED WORK

CAPTAIN's goal is to address a new participatory design (PD) process to the field of funded EU projects for providing technological solutions to older adults and create a protocol that can lead to innovative solutions. The idea of user-driven innovation introduced by von Hippel (Hippel, 2005) seems to have a higher appeal in the general marketplace. The diversity of participatory design schemas (Halskov and Hansen, 2015) and the particularities of EU funded projects raise the need to find new design practices.

In (Kanstrup, 2012), Kanstrup presents the maXi-project in which designers has worked with 17 families with one or more diabetic aiming to create an interactive system to support everyday life with diabetes. In the COGKNOW project (Mulvenna *et al.*, 2007) the design team iterates the development three times and the goal of each cycle is to improve the final system engaging also end users through workshops and field trials. (Zouganeli *et al.*, 2017) support that the users should be involved all the way in the design. Their work aims at involving people with mild cognitive impairment, dementia and their caregivers and family in the design of a technological approach providing support in various aspects of the everyday life.

CAPTAIN tries to go beyond that approaches by defining a protocol of user-driven innovation approach based on business innovation model (Design Thinking, Lean Startup and Agile) and responsible research and innovation (RRI).

3 MATERIALS AND METHODS

This work presents the methodology and results of the 1st session of the Design Thinking process for CAPTAIN project for the Greek pilot site hosted by the Thessaloniki Active and Healthy Ageing Living

Lab (Thess-AHALL). The first phase of the Design Thinking session, the Empathize, was carried out in a single session with the participation of primary (older adults) and secondary (formal and informal caregivers) end-users followed by the Define phase which was carried out by the CAPTAIN team.

3.1 Material Preparation

The method selected for the Empathize session was based on the use of personas. Six personas were created that adequately depict CAPTAIN's main targeted end-users. Figure 1 presents the personas created for the session. For the preparation of the personas the whole multidisciplinary CAPTAIN consortium provided insights during a plenary face–to-face meeting open discussion. Also, 6 end-users (2 older adults, 2 caregivers, 2 facilitators) were involved in order to distinguish issues about presentation and content. After integrating their feedback, the personas concluded in their current version presented in the next session.

Figure 1: Example of CAPTAIN persona.

The main goal of this session was to define the problems that older adults face in their everyday lives at home based on 4 main axis: nutrition, physical and cognitive activity, social participation and risk avoidance, and then recognize how they currently solve these problems. As older adults are defined people of age greater than 60 years old (World Health Organization, 2010). The protocol for the session was initially drafted and tested with 2 older adults in Thess-AHALL in order to detect any issues that may arise and improve the whole procedure.

3.2 Personas

The personas' role is twofold: on one hand they help partners to gain deeper understanding of the system's end-users and on the other hand they are created to aid participants develop empathy and initiate discussion about their own lives, too.

3.3 World Café

A World Café is a structured process that enables conversation and knowledge sharing in which groups of people discuss a topic at several tables. The participants are switching tables periodically (one or more times) and getting introduced to the previous discussion at their new table by a "table facilitator" (Brown, J. Isaacs, 2010). The methodology followed in this work adopted the World Café conversational framework in order to enable the participants to hear about different user personas and increase the empathy that they feel without limiting their opinion.

The procedure was managed and moderated by 5 table facilitators, one moderator and two assistant personnel. Each table facilitator was in charge of a single persona and for moderating a group of 5-6 people. At the beginning of the session the participants were all sitting together and they attend a small presentation of the CAPTAIN project and the aim of the session. Subsequently, the participants were divided randomly into 5 groups of 5-6 people. Each group was seated in a different round table with one facilitator. One persona was excluded from the Greek session due to the number of participants.

After the participants have been divided into groups and were sited in different tables, the table facilitators presented the persona to their tables. The personas were presented orally to the participants by the table facilitator and were also placed in the table in a printed version (Figure 2) .The facilitator presented the basic information about the personas (age, relationship, children, health status and likes) and explained the purpose of the exercise: 'Imagine, define and describe the problems that this specific persona faces in his/her everyday life". Facilitators avoided sketching more details on their personas than the ones shown in the printed paper (Figure 2). Additional information was available only for the table facilitator (Figure 1) while other details or questions remain unspecified, by replying for example "We do not have this information about X".

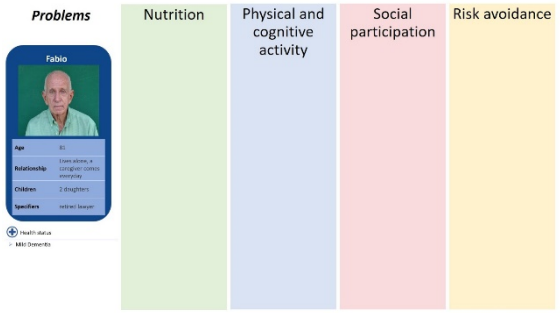

Figure 2: Canvas for problem definition.

The facilitator encouraged the participants to answer the following question "Which do you think are this persona's problems regarding the 4 main axes (Figure 2)?", participating also in the discussion and helping the participants to write down their ideas. The facilitators' incumbent was to moderate the conversation and make sure that it does not diverge from the target. Each problem was written in a separate post-it as an one short, clear phrase. The discussion lasted for 30 minutes and was followed by a short break to avoid straining the participants.

Afterwards, the participants switched tables so that everyone had a new table facilitator. Each table facilitator kept the same persona which explained to the newcomers. Then every problem was presented separately, inviting the participants to provide solutions. The main objective of this round was to find out how people are dealing with the problems defined in the previous round. The facilitators were encouraging the participants to talk about their own experiences or from their environment on how they handle similar problems (Fitzpatrick, 2014). The team suggested a couple of solutions for each problem and wrote them on another post-it paper using short, clear phrases. This discussion lasted 30 minutes too.

3.4 Participation Satisfaction Evaluation

At the end each participant was asked to answer a short questionnaire regarding his/her satisfaction and approval of the procedure.

The questionnaires were designed to be short enough, to not burden the participants but include some critical questions.

The first question was about the overall satisfaction of the current meeting. The answers were given in a 5-point Likert scale: 1 (Very Unsatisfied), 2 (Unsatisfied), 3 (Neutral), 4 (Satisfied), 5 (Very Satisfied).

The second question was about the willingness to keep attending the CAPTAIN community meetings. This question is an indication of how interesting they found the session and the value they find in being part of the community.

The third question was based on Net Promoter Score (NPS) (Promoter, 2017). NPS is a management tool for measuring the willingness of a customer (in our case participant) to propose a product or service. It is an indicator of the customer's loyalty and overall satisfaction. It can also measure the word of mouth accountability. Regarding CAPTAIN session, NPS score is used as an indication of satisfaction and can also provide an insight of the possibility to broaden the CAPTAIN community. To calculate NPS, the participants are divided into three categories based on their answers.

1. Detractors are the participants that gave score lower or equal to 6 and are more likely to damage session's reputation by negative word of mouth
2. Passives that gave score 7 or 8. They most probably enjoyed their participation but they are not that enthusiastic to actually promote it.
3. Promoters that answered 9 or 10 who are the most probable to encourage other people to join too.

3.5 Participants

Thirty three Participants were recruited using voluntary sampling (O'Leary, 2004) and were older adults (n=26) (above the age of 60), as well as formal and informal caregivers (n=7). As formal caregivers are considered all types of professionals, e.g. doctors, nurses, psychologists and physical therapists while informal caregivers include both family members living or not with the elderly and paid healthcare workers, not necessarily undergoing qualified training, who provide day-to-day help/assistance to elderly people.

4 RESULTS

At the end of the session each facilitator gathered the post-its that were describing the problems and the solutions defined in the session for each persona. These, along with the facilitator's personal notes was digitalized and categorized based on the objective and not the persona. Same problems, even those defined with different words, were consolidated in one. For each problem various solutions were presented.

4.1 Session Output

In the following section, the problems and solutions defined by participants of the session are presented.

4.1.1 Nutrition

In the nutrition category are included all problems related to eating disorders, difficulties in food preparation and consumption that may lead to eating disorders and mental health problems that can limit the ability of organizing food routines and eating. The

problems gathered are summarized in the following four categories.

1. Problems in food preparation (e.g. confuse food ingredients, burn food, do not know how to function some devices)
2. Problems with food that are stemming from memory issues (skip some meals, dehydration, poor nutrition, poisoning, forget what is permitted to eat)
3. Gain/lose weight (not balanced diet due to lack of information, used to not healthy diet, sensitivity in food consumption, not scheduled meals)

4.1.2 Physical and Cognitive Activity

All the problems concerning the physical and cognitive difficulties that an older adult might face when dealing with everyday life activities are included in this category. By physical activity we mean all the activities requiring body movement and physical strength and by cognitive all the activities that require complicated reasoning and logic.

1. Memory issues (forget medication, forgets where he/she stored things)
2. Decrease of body strength (lack of physical activity, balance difficulties, fear of getting hurt/injured, fear of falling, aches in different body parts)
3. Psychological issues (difficulty when he/she needs to ask for help, lack of confidence, stress, anxiety, sadness)
4. Loss of personal capacities (sleep problems, lose ability of solving problems, problems in reading books/the news, problems with personal hygiene, problem with organizing outings, use of toilet, difficulties with shopping)

4.1.3 Social Participation

This category focus on defining the main parameters and variables for lifestyle and social participation. The difficulties that came out in social inclusion and maintain an active social life as the people age was the main purpose of this category. This category includes also issues that have as an impact the possibility to lose or reduce social contacts.

1. Reluctance for group gatherings (reduced ability to talk and communicate, trouble in expressing/managing emotions, fear about forgetting important things about friends/family)
2. Change in social activities due to loss of personal capacities (difficulties in mobility, lack of personal time due to health deterioration, forgets important meetings, loss of ability to drive)
3. Change in social activities due to psychological issues (depressive symptoms, sadness, lack of self-esteem, fear of being a burden)
4. Unawareness (not able to find information about local events, not familiar with technology)

4.1.4 Everyday Risks

The scope of this category was to define everyday issues that may lead to dangerous situation and what older adults do in order to avoid or prevent these situations.

1. Risks stemming from memory issues (forget to turn off an electrical device, take wrong medication, food poisoning, forget to lock the front door)
2. Risks associated with physical capacity (risk of falling, slip over cables, carpets, scattered objects in the physical environment, dizziness when climbing stairs, when picking something up)
3. Risk of being deceived (abusive phone calls and visits e.g. sales, mistakes when dealing with money)

4.1.5 Solutions

Regardless the objective, all solutions were grouped in four categories:

1. Reminders/Alarms, including solutions for creating various reminders and notifications
2. List/calendars/instructions, including proposed solutions for scheduled events, information and lists for events or people
3. Role of relatives/friends/experts in providing assistance or solutions to various problems. Their role could be advisory, motivational or educational
4. Personal motivation, concerning solutions that require self-stimulation without the aid of external factors. These solutions also include behavior change.

The solutions that came up from the discussion are presented in Table 1, Table 2, Table 3 and Table 4.

Table 1: Solutions for the problems defined for nutrition.

Problem	Solution Type	Description
Gain/lose weight	Lists Calendars Instructions	- set specific hours for meals - friends or relatives take care of his/her diet - psychoeducation
	Relatives Experts	- advice from nutritionist
	Personal motivation	- exercising - information from internet about herbs and healthy diet - step by step change
Memory issues	Reminders Alarms	- to drink water - to eat meals
	Lists Calendars Instructions	- list with diet in the fridge - list with permitted foods
Food preparation	Relatives Experts	- simple guidelines - pictures on cupboards with ingredients - gather all the ingredients in the table before starting to cook
	Personal motivation	- direction from relatives on how to use electrical devices

Table 2: Solutions for the problems defined for physical and cognitive activity.

Problems	Solution Type	Description
Loss of personal capacities	Lists Calendars Instructions	- create routines (time going to bed)
	Personal motivation	- organize personal space (place of things, furniture) - use audio books to read -change routines (not lifting weight)
Psychological issues	Relatives Experts	- help from professional for confidence issues
	Personal motivation	- Strategy games for problem solving - breathing exercise
	Reminders Alarms	-reminders to go walking
Decrease of body strength	Relatives Experts	- help from friends/relatives in household
	Personal motivation	- exercising - walking, yoga, pilates - household as a form of exercise
Memory issues	Reminders Alarms	- reminders for medication
	Lists Calendars Instructions	- pillbox to organize medicine - signs and labels in things

Table 3: Solutions for the problems defined for social participation.

Problem	Solution Type	Description
Unawareness	Lists/calendars/instructions	- learn to search for local events on the internet
	Relatives Experts	- friends/family to inform him/her about local events
Change in social activities due to psychological issues	Relatives Experts	- meet friends through groups and activities
	Personal motivation	- entertainment activities - reading, writing thoughts in a diary - traveling
Change in social activities due to loss of personal capacities	Reminders Alarms	- reminders to call relatives/friends
	Lists Calendars Instructions	- simple instructions on how to use technology to communicate - speed dial
	Relatives Experts	- friends/ relatives help in transportation
	Personal motivation	- new hobbies (e.g. reading group, local social group)
Reluctance for group gatherings	Reminders Alarms	- reminders to meet/visit friends
	Relatives Experts	- "dementia-awareness" training for family and friends to improve knowledge of condition - scheduled meetings with relatives/friends - friends to motivate to go out/socialize
	Personal motivation	- education about the benefit of social life - visits in his/her former job environment

Table 4: Solutions for the problems defined for everyday risks.

Problem	Solution Type	Description
Risk of being deceived	Lists/calendars/instructions	- note down money transactions
	Personal motivation	- not having a lot of money at home
Risks associated with physical capacity	Reminders Alarms	- emergency button - automatic fall detection system
	Relatives Experts	- help from relatives/friends in households
	Personal motivation	- ergonomics - avoid households that he/she cannot do - place useful items lower
Risks stemming from memory issues	Reminders Alarms	- reminders to lock doors - reminders to turn off devices - sign on the door to lock
	Lists Calendars Instructions	- instructions on how to use devices - easily accessible list with emergency phones

4.2 Questionnaires

As far as the participation satisfaction questionnaires are concerned, 32 out of the 33 participants (97%) express the will to keep attending the CAPTAIN community meetings. The Net Promoter Score (NPS), determined by subtracting the percentage of participants who are detractors from the percentage who are promoters, was NPS= 41%-22%=19 (Figure 3).

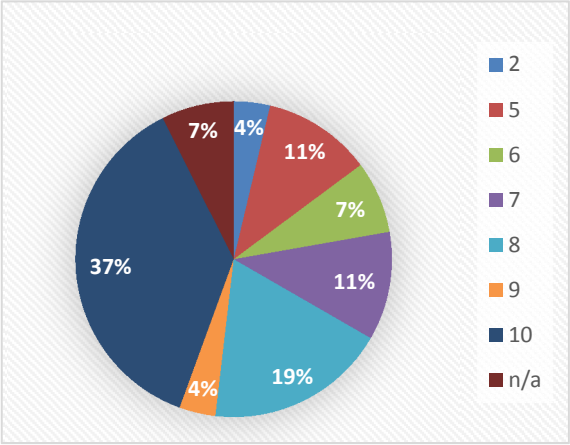

Figure 3: Answers to question 2answers.

Last but not least, there was an open question about possible suggestions for the next session. The participants mentioned:

"Very useful, helpful for development of technological solutions as well as everyday practical actions because the session makes you think deep in problems"

"I really enjoyed it, congratulations to the coordinators. I would like this to be repeated again and again"

However, most of the participants did not write any comment or recommendation.

5 DISCUSSION

This paper presents the 1st Design Thinking session of the Greek pilot site of the CAPTAIN community. The CAPTAIN consortium adopting a user-centred, agile methodology will carry out a number of meetings with the end-users in which participants and the CAPTAIN team will co-design the system that older adults would like to use.

This session's goal was to identify the everyday difficulties that older adults face and clarify the means they are currently using to address these problems. At this stage of the design, the input gathered did not concerned technological issues. It is very important to understand older adults' preferences and routines and create a system that facilitates and assists them, not a system that uses the most innovative technology but nobody wants to use.

Some very interesting outcomes came out from the discussion with CAPTAIN's end-users. The fact that a classification of solution in four main categories was noticeable, rises the research interest of investigating technological solution in that four directions. Furthermore, it is clear that social life and communication have a prominent role in older adults' everyday lives. To this extend, a technological solution should support their social inclusion and interaction with other people and not try to substitute human presence.

However, the results did not deviate from the existing literature regarding older adults' everyday needs. A detailed comparison of the existing literature, which has already been studied among the CARTAIN consortium and the results from the Design Thinking session is the next step.

Another important outcome of this session was the satisfaction of involvement depicted on the questionnaires. The goal is to create and maintain a community throughout the project and the first step was this session.

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REFERENCES

Brown, J. Isaacs, D. (2010) 'Improvisation the World Cafe: Shaping our futures through conversations that matter', *Journal of Religious Leadership*, 9, pp. 120–123.

Centers for Disease Control and Prevention (2013) *The state of aging & health in America 2013*, *Centers for Disease Control and Prevention US Dept of Health and Human Services*. doi: 10.2217/1745509X.3.2.139.

Chaudhuri, S., Thompson, H. and Demiris, G. (2014) 'Fall detection devices and their use with older adults: A systematic review', *Journal of Geriatric Physical Therapy*, pp. 178–196. doi: 10.1519/JPT.0b013e3182abe779.

Chen, Y. R. R. and Schulz, P. J. (2016) 'The Effect of Information Communication Technology Interventions on Reducing Social Isolation in the Elderly: A Systematic Review', *Journal of medical Internet research*, p. e18. doi: 10.2196/jmir.4596.

Fitzpatrick, R. (2014) 'The Mom Test', *Igarss 2014*, (1), pp. 1–5. doi: 10.1007/s13398-014-0173-7.2.

García-Lizana, F. and Sarría-Santamera, A. (2007) 'New technologies for chronic disease management and control: A systematic review', *Journal of Telemedicine and Telecare*, 13(2), pp. 62–68. doi: 10.1258/135763307780096140.

Halskov, K. and Hansen, N. B. (2015) 'The diversity of participatory design research practice at PDC 2002-2012', *International Journal of Human Computer Studies*, 74, pp. 81–92. doi: 10.1016/j.ijhcs.2014.09.003.

Hippel, E. von (2005) *Democratizing innovation*, *The evolving phenomenon of user innovation*. doi: 10.1111/j.1540-5885.2006.00192_2.x.

Kanstrup, A. M. (2012) 'A small matter of design', in, p. 109. doi: 10.1145/2347635.2347651.

Mulvenna, M. *et al.* (2007) 'COGKNOW : Translating Research Innovation into Products and Services', *Expanding the Knowledge Economy, Issues, Applications, Case Studies*, pp. 575–583.

O'Leary, Z. (2004) 'Volunteer Sampling', in *The Essential Guide To Doing Research*, p. 110. doi: 10.4135/9780857020116.n223.

Plattner, H., Meinel, C. and Leifer, L. (2011) *Design Thinking Research - Understanding Innovation*, *Design Thinking: Understand, Improve, Apply*. doi: 10.1016/B978-0-12-387667-6.00013-0.

Promoter, N. (2017) 'Net Promoter Score ® Calculation', *Inside Learning Technologies & Skills*, 135, pp. 1–5.

Reeder, B. *et al.* (2013) 'Framing the evidence for health smart homes and home-based consumer health technologies as a public health intervention for independent aging: A systematic review', *International Journal of Medical Informatics*, pp. 565–579. doi: 10.1016/j.ijmedinf.2013.03.007.

Ries, E. (2011) *The Lean Startup*, *Journal of Chemical Information and Modeling*. doi: 23.

Schwenk, M. *et al.* (2015) 'Wearable sensor-based in-home assessment of gait, balance, and physical activity for discrimination of frailty status: Baseline results of the Arizona frailty cohort study', *Gerontology*, 61(3), pp. 258–267. doi: 10.1159/000369095.

World Health Organization (2010) *Definition of an older or elderly person*, *Geneva, Switzerland: WHO*. Available at: http://www.who.int/healthinfo/survey/ageingdefnolder/en/index.html.

Yang, N. and Ornstein, K. (2015) 'The impact of symptom burden on hospitalization, nursing home placement and death among homebound older adults', *Journal of the American Geriatrics Society*, 63(SUPPL. 1), p. S134. doi: http://dx.doi.org/10.1111/jgs.13439.

Zouganeli, E. *et al.* (2017) 'Responsible Development of Self-learning Assisted Living Technology for Older Adults with Mild Cognitive Impairment or Dementia', in *3rd International Conference on Information and Communication Technologies for Ageing Well and e-Health Volume 1: ICT4AWE, ISBN 978-989-758-251-6*, pp. 204–209. doi: 10.5220/0006367702040209.