



PersonAAL



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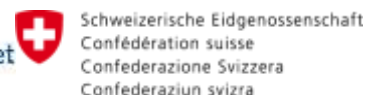
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1 INTRODUCTION

Essential to the PersonAAL project's overall goal of prolonging independent living for older adults, is the focus on increased daily activity among the system users, including social communication and activities. This document describes the initial concepts and ideas considered in the PersonAAL project to provide users (elderly and caregivers) with intuitive social support.

In order to explain of how social mechanisms are defined and operationalised in this context, a general overview of how social interactions have been implemented in the past, is paramount.

When reviewing tools developed in the last 15 years, three distinct contexts of particular interest emerged: 1) the ability to share experiences and knowledge with others; 2) the ability to facilitate information transfer or communicate with others; and 3) the ability to get in contact with others (be it family, close friends or neighbours). Regarding the first, Santana et al. [Santana2005] was among the first to support this by implementing a digital web-based family newspaper through which both older adults and their relatives could share important information like personal reminiscences and cultural stories. In the same year, Brunette et al. [Brunette2005] targeted the same issue differently by building a connection between individual homes and a local community centre, creating a digitalized support network for older adults living alone where each individual could share information with the others.

Regarding the second context and with the only goal of establishing better ways of communication between older adults and family members both Lindley et al. [Lindley2009] and Vetere et al. [2009] focused on sharing of photos between older adults and their relatives. While the initial focused on asynchronous message to not create the sense of social obligation, the latter focused more on developing a technical solution probed to create new experiences. Additionally, a wide range of work followed similar principals like Giorgi et al. [Giorgi2011] and Gaver et al. [Gaver2011] systems which made use of digital mementos and photos as a tool to increase social interaction.

Combining the first and the second context, Vutborg et al. and Raffle et al. [Vutborg2010, Raffle2011] developed storytelling systems which explored grandparents and grandchildren sharing over distance. These did not only help in carrying out of every-day tasks but also offered functionalities facilitate communication with others.

Concerning the third context, a great set of examples were given five years ago: Waycott et al. [Waycott2012] created a media sharing system which encouraged older adults to build social connections by sharing messages and photographs with each other; Grosinger et al. [Grosinger2012] was one of the first to make use of physical

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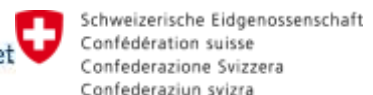


activities to promote social engagement between older adults; and Lindley et al. [Lindley2012] developed Wayve a system capable of increasing communication with relatives by providing features like the one-click message sending, the possibility to scribble messages and to send personal touches (small videos or signs).

These early examples formed the basis of social applications targeting older adults, and more recent research seem to combine all the three contexts into different social systems [Cornejo2013, Baecker2014, Neves2015], including ambient and independent living solutions [Fitzpatrick2015, Lazar2017].

The social support system of the PersonAAL-project is inspired by all these concepts, and we aim to embody social mechanisms in the PersonAAL framework and the three applications.

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2 TECHNIQUES FOR SOCIAL SUPPORT

Inspired by the above-mentioned studies, we will develop a set of functionalities or techniques focused on providing social support. In this section, we present techniques to be implemented on top of the PersonAAL applications and framework, capable of fostering social interaction without creating a sense of social obligation. These techniques are focused on the three distinct contexts previously identified: Share experience/knowledge with others; Facilitate information transfer or communication; and Get in contact with other people.

2.1 Share Experiences or Knowledge with Others

PersonAAL will focus on three distinct ways of providing older adults with the ability to share experience or expertise with others. Sharing interesting activities, interesting locations and sharing or recommending distinct (rehabilitation) exercise. In the following tables, we give a brief description of each one.

Sharing Interesting Activities

Description:

The opportunity to suggest another activity to a friend or relative (walking to a specific place, have lunch/dinner at a specific place, etc.) after performing an activity or while planning to do one. This could be done by providing the option (button or pop-up dialog) to share information with a contact (by searching a name, or selecting from a recommended/favourite list), and send a message or call him/her.

This could also be performed by the caretaker taking advantage of his/her knowledge about the older adult, and as a predefined response to a specific context (e.g. when the elder has not gone out for a pair of days) through the creation of a trigger-action rule.

By Who:

- Older Adults
- Caretakers

When:

- Reporting an Activity
- Planning an Activity
- Caretaker predefined context

Where:

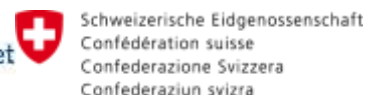
- Remote Assistant Application
- Rule-creation / Persuasion Model

Sharing Interesting Places

Description:

Similar to the previous technique this one offers the possibility to suggest a location to a contact (a park, a market, a book fair, a restaurant, etc.) after performing an exercise activity at a specific place (or other kind of activity), or while planning to go to that specific place (which can foster offline social interactions). This could also be performed by the caretaker taking advantage of his/her knowledge about the older

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adult, and as a predefined response to a specific context (e.g. when the elder has not gone out for a set of days) through the creation of a trigger-action-rule.		
By Who:	When:	Where:
<ul style="list-style-type: none"> Older Adults Caretakers 	<ul style="list-style-type: none"> Reporting an exercise activity Doing an outside activity Caretaker predefined context 	<ul style="list-style-type: none"> Remote Assistant Application Rule-creation / Persuasion Model

Recommend Exercises		
Description:		
Possibility to recommend a specific exercise to a contact when making use of the rehabilitation application to report exercises performed or when scrolling through a set of exercises. This can and should also be done by caretakers when specific exercises are needed and can contribute to an older individual resettlement (when needing a specific exercise as a way of recovering some lost function, or as prevention step). In this last case, this can be done through the creation of a specific trigger-action-rule.		
By Who:	When:	Where:
<ul style="list-style-type: none"> Older Adults Caretakers 	<ul style="list-style-type: none"> Scrolling through exercises Reporting exercises Caretaker predefine context 	<ul style="list-style-type: none"> Rehabilitation Application Rule-creation / Persuasion Model

2.2 Facilitate Information Transfer or Communication

In terms of facilitating information transfer or communication between older adults and their relatives or friends (or caretakers), the PersonAAL project is focusing on four distinct techniques: support the possibility of zero-click and one-click messages, the possibility of sharing activity reports to Facebook, and the ability to share photos from activities or family gatherings to Facebook. In the following tables, we give a brief description of each one of these.

Support the possibility of zero-click messages		
Description:		
Every time an older adult has performed an exercise activity or a social activity (gone for a walk, performed a rehabilitation exercise, had lunch with family, etc.) and reports it to the system (e.g. through the Remote Application calendar function), PersonAAL will offer the possibility to provide automatic feedback to others (older adults, caretakers) without the need to press any additional button. This technique will be optional and in accordance with the users' privacy preferences, and a proper feedback will be given to the user to make him/her fully aware of the sharing.		
By Who:	When:	Where:
<ul style="list-style-type: none"> The System 	<ul style="list-style-type: none"> Reporting an exercise activity 	<ul style="list-style-type: none"> Rule creation

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	<h2>Techniques for Social Support (Initial)</h2>	
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	<ul style="list-style-type: none"> • Reporting a social gathering activity • Reporting a visit to a specific location • (etc.) 	
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<h3>Support the possibility of one-click messages</h3>		
<p>Description:</p>		
<p>Similar to the previous technique, this one will provide semi-automatic feedback to others (older adults, caregivers) every time an older adult reports a specific task/measurement satisfaction. This means that when reporting a specific task or physical exercise, older adults can rate those activities in terms of satisfaction by choosing from a set of buttons with distinct ratings. After that classification occurs, it will be sent automatically. Additionally, privacy settings (who will see what) will be possible to configure by the users.</p>		
<p>By Who:</p>	<p>When:</p>	<p>Where:</p>
<ul style="list-style-type: none"> • Older Adults • The System 	<ul style="list-style-type: none"> • Reporting an exercise activity satisfaction • Classifying an exercise 	<ul style="list-style-type: none"> • Remote Assistant Application • Rehabilitation Application • Rule-creation

<h3>Share activity report to Facebook</h3>		
<p>Description:</p>		
<p>Possibility to create awareness among others (relatives, caretaker) by sharing activity reports on Facebook feed. This can be done through the provision of a sharing option on the application user interface when reporting any type of activity. Ideally an explicit group selection should also be supported in order to give a clear overview of who will be able to see which reports. Additionally, while an option to this as a default could be offered it will never be set without the user total acknowledgement.</p>		
<p>By Who:</p>	<p>When:</p>	<p>Where:</p>
<ul style="list-style-type: none"> • Older Adults 	<ul style="list-style-type: none"> • Reporting any type of activity 	<ul style="list-style-type: none"> • Remote Assistant Application • Rehabilitation Application

<h3>Share photo (activity-related, family-related) to Facebook</h3>		
<p>Description:</p>		
<p>Similar to the previous technique, but providing more detail and with the goal of spurring both online and offline discussions and create awareness among contacts</p>		

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(caretakers, relatives), this technique supports the possibility to share photos on Facebook feed. Photos can be related with both exercise and social activities, and interfaces will offer an option to upload and share a related photo when reporting any of these activities. Even though another possibility would be to provide this feature to relatives and caretakers, with the current applications this would be difficult to implement in PersonAAL.

By Who:	When:	Where:
<ul style="list-style-type: none"> Older Adults 	<ul style="list-style-type: none"> Reporting an exercise activity Reporting a family gathering / meal 	<ul style="list-style-type: none"> Remote Assistant Application

2.3 Get in Contact with Other People

Regarding functionalities that support older adults with opportunities to get in contact with others, PersonAAL will focus on three distinct ways: support the possibility of inviting contacts for performing an activity or eating together, and the ability to receive and send notifications to others on events happening close-by. In the following tables, we provide a brief description of the three:

Invite for an Activity		
Description:		
<p>Possibility to invite a contact when activity is being planned or when receiving a suggestion to perform an activity. This could be done by offering an invitation option through which older adults could search for a specific contact (by name, a list with recommendations, or a list with contacts available close-by) and send invitation (without having to write anything) or by displaying contact information to motivate individuals to call someone to invite him/her more personally. Additionally, the possibility of doing this when receiving a suggestion for an activity is directly related with the persuasion model ability to understand the older adults need for performing a specific activity (e.g. been staying at home for several days) and sending a suggestion through the system (be it a pop-up on the smartphone, or in any PersonAAL application).</p>		
By Who:	When:	Where:
<ul style="list-style-type: none"> Older Adults 	<ul style="list-style-type: none"> Planning an activity 	<ul style="list-style-type: none"> Remote Assistant Application
<ul style="list-style-type: none"> The System 	<ul style="list-style-type: none"> Persuasion Model/Rule suggests activity 	<ul style="list-style-type: none"> Rule Creation / Persuasion Model

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Social Meal		
Description:		
<p>Similar to the previous technique, this one supports older adults with the possibility to invite a contact for a meal. This should be done through the provision of an invitation option on the remote assistant application user interface when planning an event (through the calendar). That option would let older adults search for a specific person and send that contact an invitation (with the option of writing the invitation or sending a default message) or display that contact information for the older adult to call him/her on the phone. This could also be offered when the system detects a period of low social activity level and suggests to the older adult to have a meal with someone (the user could then have the options to select a contact).</p>		
By Who:	When:	Where:
<ul style="list-style-type: none"> • System 	<ul style="list-style-type: none"> • Persuasion Model/Rule suggests activity 	<ul style="list-style-type: none"> • Remote Assistant Application • Rule creation / Persuasion Model
<ul style="list-style-type: none"> • Older Adults 	<ul style="list-style-type: none"> • Planning a social event 	

Receive/send notifications on events close-by		
Description:		
<p>This technique provides older adults with recommendations on close-by events, or with the possibility of sharing these with their contacts. This could be done in two ways, through the inclusion of an option to search for an event close-by (will make use of GPS and internet services or background information about older adults preferred locations) when planning an activity and the respective set of options to search for a contact, and sending a message with the suggestion or displaying contact information (like in previous techniques). Or initiated by the system when detecting a low physical activity level and making use of those close-by events as a way of stimulating older adults to get out of the house.</p>		
By Who:	When:	Where:
<ul style="list-style-type: none"> • Older Adults 	<ul style="list-style-type: none"> • Planning an activity 	<ul style="list-style-type: none"> • Remote Assistant Application • Rule creation / Persuasion Model
<ul style="list-style-type: none"> • System 	<ul style="list-style-type: none"> • Persuasion Model /Rule suggests an event (based on location, interests and historical data) 	

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3 PERSONAAL SUPPORT FOR SOCIAL TECHNIQUES

In order to accomplish all previously described social techniques, PersonAAL will make use of several of its modules and applications. We now describe those components detailing how each one contributes to the support of these social techniques.

3.1 Remote Assistant Application

The Remote Assistant Application is set to be the main vehicle for the support of all social techniques described, by being the main application offering the users the ability to initiate and plan activities and combined those with social opportunities. This is done through the inclusion of several features like the option to invite contacts when planning activities, the option to share activity reports, the option to classify activities and sharing those insights with others, etc. Additionally, it also constitutes the main platform for interventions initiated by the rule-editor and the persuasion module providing ways of combining these with social opportunities. In summary, it provides the ways to implicitly or explicitly share information with others, as well as it provides the tools to increase offline social interactions.

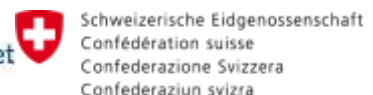
3.2 Rehabilitation Application

Like the remote assistant application but in a more specific context, this application allies the planning and reporting of rehabilitation exercises with the possibility of sharing knowledge about these with older adults' contacts (or with other older adults).

3.3 Rule-Editor

Social opportunities are not only initiated explicitly by the older adults but can also be initiated by the caretakers. For this to happen the rule-editor provides the latter with the ambient to create and set up rules based on specific triggers. These rules involve social activities both in a direct manner and as a response to a social need (e.g. suggesting inviting a person to come over if the older adult has not seen anyone for a couple of days) and in an indirect way by combining social opportunities with triggers related to physical activity (e.g. suggesting inviting someone to go for a walk if the older adult has been staying at home for the last couple of days). Every time a trigger is activated (a condition is verified after going through the user collected data) the rule is fired and a related user interface procedure is activated (through the adaptation module). Several of these procedures are related with the creation of the social opportunities described in the previous section. Therefore, the rule-editor makes possible for caretakers to tackle older adults' social needs and at the same time associate physical activities with social activities. Additionally, it is also thought the

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rule-editor that particular social techniques like the zero-click-messages and the one-click-messages are set up.

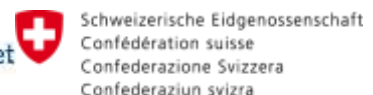
3.4 Persuasion Module

The persuasion module is responsible for several processes indirectly related with the provision of social techniques in PersonAAL. The first is the identification of the pre-defined contexts in which certain opportunities will be activated. This means that the persuasive model is responsible for identifying patterns related with older adults' data collected through the sensors and classifying those patterns as deviations in the user behaviour or not (e.g. abnormal social interaction levels, abnormal physical activity levels, etc.). When deviations occur, the module is also responsible for defining the appropriate persuasive strategies (interventions) to be performed in order to change user behaviour. By applying persuasive techniques this module is increasing older adults' chances of accepting the proposed interventions, and as several of these will be related with social opportunities (e.g. if the user needs to increase social interactions) it is therefore increasing the likelihood of these social techniques to work. Summarizing, the persuasion model role in the described social techniques is indispensable, as any implicit social opportunities related with needed behaviour changing interventions is initiated and partially configured by this module.

3.5 Adaptation Engine

The adaptation engine is the PersonAAL component responsible for defining the best way to present any rule defined in the rule-editor (and originated from a caretaker defined trigger, or from a persuasive module defined trigger) in the form of user interface elements. These configurations are dependent not only on user characteristics but also on interaction and application contexts. Therefore, the role of the adaptation engine is to define the best way to present each social technique (e.g. size of text, font colour, background colour, timing of the message, etc.).

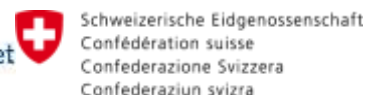
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CONCLUSIONS

This deliverable reports on the techniques for social support currently being considered in the project. It presents each social support scenario describing the involvement of the PersonAAL components, applications and end-users. While all the presented social techniques are still in its conceptual form we plan to start implementing it in the next months of the project. All implementation steps as well as additional techniques or additional variants of these techniques considered in the future, will be properly described in the next deliverable in month 30 (D1.4b). Future work will also be dedicated to further extending these techniques, integrating them into functional prototypes and validate them from user's viewpoint.

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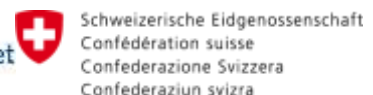
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