END-USER EXPERIENCES AND PERSPECTIVES - HOVIMESTARI

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Abstract

This paper is about results of the first stage of a field trial that aims to evaluate end-user practices with HoviMestari, one of the systems that intends to support independent living of disabled and elderly people. The field trial has been launched in the Raahe District of Northern Ostrobothnia, Finland, in the beginning of 2014 and continues. 16 services were selected by a group of 20 test users for a field trial and tested. Average age of test users is above 65 and the group consists of retired and pre-retired people, where 5 of them are formal care-givers. In the paper a description of gathered end-user attitudes towards services provisioned with the help of the HoviMestari system as well as discovered during the field trial future perspectives of a multi-service environment are presented.

Introduction

Objectives of the work presented in this paper are to assess end-user practices with one of the systems providing support for Ambient Assisted Living (AAL) [1], to collect their attitudes towards services provisioned with the help of the system and to identify future perspectives of a multi-service environment.

HoviMestari [2][3][4] is one of the front-ends of an ambient assisted environment that targets people of different ages and abilities to make life easier at home by simplifying everyday tasks and activities. It has a reusable modular architecture allowing delivery of a variety of services through an original user interface designed for such end-user terminals as TV, mobile, and touch-screen devices.

Ubiquitous Home Environment (UHE) [5][6][7] is a user-centric set of ambient assisted systems that serve users in domestic space and expands its services to other spaces in order to facilitate the Smart Living concept [8][4]. A primary goal of the HoviMestari as the UHE front-end is to be an interface for home services supporting independent living [9].

Within the Advanced Support for Independent Living; Human Lifecycle Approach in Senior Housing (LILY) project [10], funded by the Ambient Assisted Living Joint Programme, a one-year field trial with third-age end-users and formal caregivers was launched in the beginning of 2014. The test group of 20 end-users was supplied with a limited version of the HoviMestari that was entirely mobile: the only end-user terminals were 7" Tablet PCs, Google Nexus 7 (v.2, of year 2013) produced by ASUSTeK Computer Inc [11].

Direct observations with observes and data logging, open-ended and structured interviews were used in this work.

Results of the work gathered during the first stage of the field trial are presented in this paper, and overview of recognized perspectives is given.

Related Work

ReAAL project [12] is probably the largest EU-wide effort to involve 7000 end-users to test Active & Independent Living applications developed on top of the Universal Open Platform and Reference Specification for Ambient Assisted Living developed under the universAAL project [13].

Secure Active Aging: Participation and Health for the Old (SAAPHO) project focused on boosting accessibility to a diverse number of healthcare, participation and security services by means of easy-to-use and easy-to-configure user interfaces to touch-screen mobile devices [14].

Care@Home project was about empowerment, wellness and social care services to the home of the elderly through interactive multimedia SmartTV [15].

Mylife project proposed simple and intuitive ICT-services on touch-screen devices for older people with reduced cognitive function such as mild cognitive impairment (MCI) or dementia. [16].

Social Media for All elderly people (SoMedAll) project proposed easy, adaptable and guided user interfaces for creating, managing and sharing content taking into account the mental and physical capabilities of the elderly people [17].

EasyReach project developed social interactions of those individuals that, because of poor scholarisation, low income and, possibly, linguistic barriers still find it difficult to use computers to improve their socialization via a TV [18].

AMbient COmmunication for Sense Of Presence (AMCOSOP) project utilised user-centred design methods for developing of the user-friendly interfaces for reducing loneliness and fear of isolation [19].

Adaptable Ambient LIving ASsistant (ALIAS) project developed a service robot that serves elderlies with novel cognitive user interface concept ensureing a good usability [20].

Domestic Robot for Elderly Assistance (DOMEO) project developed a platform that includes cognitive and physical service robots with graphic and tactile interfaces to take care of elderlies [21].

Voice Controlled Assistive Care and Communication Services for the Home (vAssist) project proposes specific modules for voice and speech intelligence enhancements that may be utilised by existing platforms providing Home Care and Communication Services for older persons [22].

I2HOME project proposed a new series of standards for interfacing networked home appliances and consumer electronics by means of a Universal Remote Console (URC) by people with disabilities, in particular persons with cognitive disabilities and older persons [23].

Ambient Assisted Living user interfaces (AALuis) project developed UIs and a connections layer for the easy and standardized integration of new and existing UIs for interaction between users and AAL services [24].

GoldUI project developed adaptive embedded human interfaces designed for older people available via different categories of devices [25].

Cloud4all project proposes a Global Public Inclusive Infrastructure (GPII) that allows automatic personalization of products and services by augmenting and activating any their natural built-in accessibility features [26].

ALFRED project aims to develop a personal interactive assistant for independent living and active ageing [27].

In a less or more similar way, all the mentioned projects studied or continue to study end-user experiences relevant to AAL domain. Among those important considerations that are common among all of the projects are the following: a multi-modal interaction between a user and a system; a use of fixed (TV) or mobile (wearable, or carried by robots) end-user terminals, including those equipped with screen with a touch sensor capability; relatively large elements of GUIs; a use of grid layout to position control elements; provisioning of multiple services, sometimes from different service providers.

The HoviMestari was developed with all the mentioned considerations taken into account. The difference between the HoviMestari and all the other systems is in abstraction of the system from the ambient environment and service providers. The HoviMestari is rather a framework through which a variety of services may be provisioned. Home automations may be one of those. A telemedicine system may be the other one. Safety navigation [28] – one more. And so forth – a variety of service from a variety of service providers.

To simplify a development of services, and automate a service provisioning, integration levels and service templates were proposed to supplement a Decentralised Service Architecture [4].

Results

The field trial has been launched in the Raahe District of Northern Ostrobothnia, Finland [29]. Among 20 end-users, 12 of them are retired, other are pre-retired, 5 of them are formal care-givers, and 3 are continuing other working life. Women are more than half of the group. Average age is beyond 65.

Because of early end-user involvement, 16 services were selected for the field trial. All services were developed as Integration Level 0, which means that the HoviMestari is not aware of who is a user, personal profiles are not involved and thus personalisation of services is not possible. Those are subjects of Integration Level 1 services.

General Usability Aspects

General feeling about the system (that includes both, the Tablet PC, and the HoviMEstari applicatin). Most of the user used it daily, some are occasionally, and 4 users did not use it at all during the first half-period. Barriers to entry were too high for them. With an extra training, the barriers disappeared.

Handling the mobile device (with respect to physical dimensions and weight). All responses but one varied from "reasonable" to "nice". One person would like to have a bit bigger screen, while admitted an easy use.

Usability of the HoviMestari. All responses were positive with respect of how easy it was to use it, menu operations, colours, modalities, and performance.

Feedback on Services

Local weather forecast. All range of responses were received – from "not needed" to "real-time update of current weather situation and an extended forecast are needed"

National news. All range of responses, from "not needed" to "more of content visible" and "a link to a web page is needed".

Local newspaper news. The same as above.

Local events information. The same as above. Additionally, the users suggested categorising events, and widening a geographical area to entire region.

Drawing tool. Most of the responders have not used it. Few mentioned that the service is rather for children.

Memory-developing game. While one of the users does not play at all, and the other one was not interested, all the rest demanded a more advanced version of the service – with dynamic change of content, and difficulty levels.

Bible audio-book. A variety of responses: some were not interested; some claimed that book is better; one had an opinion that it is for people that are more elderly; one had difficulty to use media controls.

Church services. Just few people used it. More said that it is better to visit church. One had difficulty to understand that audio content is only available during the church service time. There were compliments on audio quality, but it depends on a source.

Video-guided exercises. All range of responses, from "not interested" to "more extensive programs and different programs for elderly are needed". One person complained that exercises were too difficult.

Radio. Most of the users were positive about the service and demanded more channels, while some were not interested.

Audio. Approximately half of the users were positive, and demanded more content, while the other half have not used it.

sonami – natural sound samples provided by sonami AG [30]. All users were interested, but some did not use it. The rest found it nice, and demanded more content. One user used to listen to real nature, as it is possible in rural areas versus urban ones.

Maps. One user found it difficult to use, three described it as "Ok". The rest were positive, and found it very useful and very important.

Calendar. Some users did not use it and/or did not find value in just an informative calendar. Few demanded opportunity to put notes, and active alarms/notifications.

Local restaurant menu. One was not interested, while the rest were very positive, and demanded availability of information from other local restaurants.

Local supermarket offers. Due to a small number of offers, this service was not well accepted by the test users. More offers and updates that are more frequent were requested, but that depends on supermarket marketing processes.

Request for Development

Regarding the general usability aspects, one user asked of opportunity to choose colours, two more would like to have a magnifying glass and/or other accessibility tools built-in to the interface. They were not aware that Android OS has some built-in accessibility tools.

Regarding the development of services, personalisation was demanded, particularly for local events, memory-developing game, video-guided exercises, maps, and calendar.

Regarding a new service demand, the most demanded service was a transportation help that could have been used "on a go". This demand was recognised in a very beginning of the field trial, and a rudimentary version of a service, having yet only one feature that displays local bus schedules depending on a location of a user was developed.

The most new requested future services are the following five:
- E-mail client that would allow to work with any email accounts from one interface designed for elderly people (8 requests).
- Medical service – making appointments at clinic, remote consultancy, audio and video communication (7 requests).
- Help at home, supply and service (7 requests).
- Emergency assistance, a more advanced version of a panic button with communication abilities (7 requests).
- Interactive calendar, interoperable with other services (4 requests).

The rest of the requested services are the following (the most important first): finding a fellow traveller, displaying digital pictures (similar to a photo-frame), car service appointment maker, bank appointment maker, life memory reminder (similar to a photo-frame), pharmacy online shop, social worker appointment maker, calling for taxi, cooking recipes, nutrition adviser, physical exercises coach, YouTube.

Conclusion

From an experience with a given group of the test users, it is possible to conclude that arrangements for increasing of awareness of AAL systems as well as systematic education of users are required. The more elderly people are involved into any processes that increase their awareness of AAL systems, the lower is their barriers to entry the use of the systems. Systematic education that include such stages as introduction, continuing advances, and reminding, will help elderlies to obtain and maintain a success of the use of AAL systems.

Personalisation and a large variety of services for any user demand are important. Personalisation increase a value of a service, while a large content or a wide

selection of choices makes it attractive. These are important considerations to satisfy a demand in AAL domain – probably as much as on other markets.

Not less important are customisation of interfaces and a multi-modal interaction with the system. Those may improve user experiences significantly. Integration into the ambient environment is important as well. Not a few of the elderlies would not mind to have the same selection of services available via their TVs, in addition to mobile devices. They would like to have an option to control/use services in a familiar way, using a remote control and a voice.

It has been observed, that the more elderly people use the system, and the more they aware of its ability, the more demand they do have. It means that with a start in good time and a proper balance of supporting education, careful introduction of new services and features, and gradual adoption to a life style of a person, it will be possible to achieve a usage of sophisticated systems by that time when the usage of such systems will be required by health conditions.

During the field trial there were organisational changes in a group of the test users. Those changes altered age and gender information, which is not presented in this work in details. Final statistical data as well as feedback on the transportation service will be available with final results of the field trial.

Acknowledgement

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