

## SKYPE FOR ELDERLY\_ AAL SUMMIT 2012

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### **Abstract**

Communication is a fundamental request of humans. Therefore the invention of Skype can be seen as social innovation in terms of talking anywhere in the world for free. The paper in hand deals with the usage of the Skype service among elderly people in the context of the HOMEdotOLD project. The idea was to introduce to them an easy, intuitive conditioned Skype application which is running on the TV set, with which most of the elderly users are familiar, in order to advance their social interaction, bridging distances and preventing them from isolation and loneliness. In the course of the project it turned out that Skype has major benefits for the elderly, among others in terms of price, ease of use and reliability. Extensive research was conducted in form of two trial phases which also contained tests in individual households at the Austrian, Hellenic and Dutch pilot site. Moreover the instruments used for measuring usability are presented, results are discussed and conclusions are drawn.

**Keywords:** TV-based, Skype, Benefits, Trials, Methodology, Social interaction;

## 1. Introduction

Nowadays, the population of the elderly grows absolutely and relatively compared to the overall population worldwide. The evolution of ICT<sup>1</sup> has allowed the development of products for the home environment assisting elderly with their daily activities including smart home solutions for devices/appliances management and pro-active remote healthcare. However, social interaction and connectivity support for elderly is lagging behind for the following reasons:

- The average elderly person is not always familiar with technology in general, thus experiencing difficulties in using ICT-based services.
- The user terminals and interfaces provided for such applications are, sometimes, complicated even for ICT-experienced younger users.
- New technologies usually impose long training procedures and a high learning curve for the elderly.

In order to counter these barriers the main human machine interface in the HOMEdotOLD project is the TV set and its remote control, which is present in almost all households and with which most of the elderly users are familiar, and not other complicated devices. The project aims to provide a TV-based platform with cost-effective services which will be delivered in a highly personalized and intuitive way. This should advance the social interaction of elderly people, aiming at improving the quality and joy of their home life, bridging distances and reinforcing social voluntariness and activation, thus preventing isolation and loneliness.

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<sup>1</sup> Information and communications technology

## 2. The HOMEdotOLD Project

HOMEdotOLD delivers web-services advancing the social interaction of elderly people on an internet enabled television and within the project the focus will be on the development of the following 2 main categories of services:

- **Personal motivation services, i.e. services for staying socially active, preventing loneliness and isolation, enabling voluntariness, motivation and activation:** This service category includes services allowing the elderly to perform meaningful activities that are useful and satisfactory for the society and themselves and create new living experiences. This category of services includes:
  - **“Social voluntary work”** service; this service runs in cooperation and under the supervision of social care organizations and notifies registered elderly volunteers about several areas of social voluntary work in which they can be involved, thus encouraging elderly people to actively contribute to solving societal problems and to perform meaningful activities that create self-satisfaction.
  - **“Personalized news headlines”** service, which provides easy access to news headlines at regional, national, European, and international level, with special emphasis on news, which inform the elderly user about the activities of interest.
- **Social networking services, i.e. services for bridging distances and supporting existing roles:** This service category includes services allowing elderly living far away from their families and close friends, to keep in touch with them and support existing roles. This category of services includes:
  - **“Intelligent calendar”** service, for the synchronization of the elderly’s agenda with the agendas of friends and family, receiving notifications about possible common activities.

- **“Photos, videos, experience sharing”** service, which allows keeping in touch with friends and families and share experiences.
- **“Skype”** service, for staying in touch with loved ones via video calling.

### **3. Skype and elderly**

It turned out during the requirements collection phase that it is a fundamental request of elderly to exchange themselves with other humans and to communicate with them. If the elderly’s relatives are abroad saving money is a top priority. This means that sometimes elderly persons choose to write letters instead of calling their contacts, to save on their monthly phone bill. However, it is important to maintain all crucial family processes such as keeping in contact with loved ones and calling family reunions. All of these could mean a very expensive phone bill.

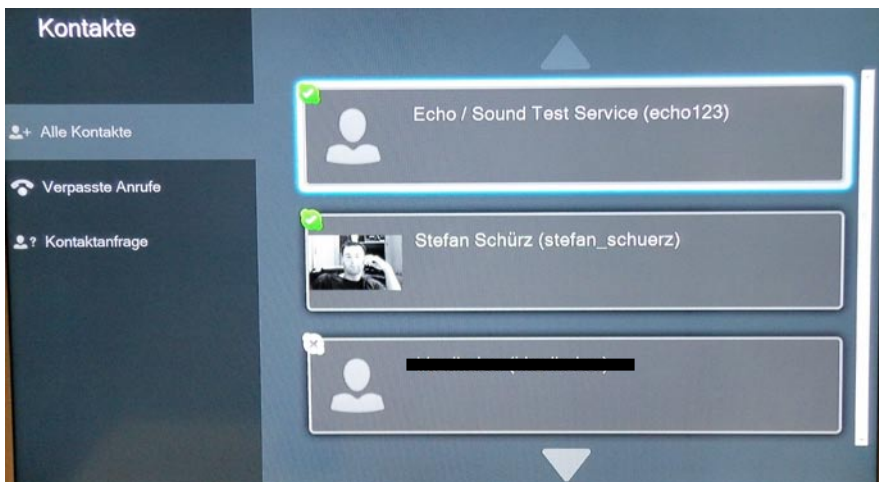
#### **3.1. Top benefits of Skype for elderly**

The use of Skype, one of the best known online meeting tools around, with, according to its website, nearly 30 million worldwide users could help to face these problems mentioned above. It lets people communicate either Skype-to-Skype, which is free, or Skype to landline or cell phone for a small fee. However some of its main benefits include:

- **Price** - Using Skype just for calling other Skype users is free - you can even have a small online meeting.
- **Ease of Use** - Skype is very easy to install, set-up and begin using. It has a really user-friendly interface that anyone, regardless of their level of tech knowledge, can learn to use. Adding new contacts, sending instant messages and placing calls are all done with the click of a button. It is also very easy to know if Skype was set up correctly, as the tool has a test call number where users can check if their audio and microphone are working

properly. This is great, as there is no guessing whether Skype was installed correctly or not.

As far as the HOMEdotOLD project is concerned, the functionality of the service is minimized to the must-have features as defined by a requirements study done in the scope of the project. The service allows for browsing a contact list, browsing a missed calls list, initiating and receiving video calls, and accepting or rejecting contact requests. Therefore adoption of the service is expected to be higher as compared to other proprietary solutions. Currently the service is implemented as a PC-based application, which simulates the experience of a native TV platform application, as it is expected that TV's with integrated videoconferencing solutions will become more widely available in the foreseen future. The service is available in two versions and was developed by the consortium partner Philips for the 1<sup>st</sup> trial phase for all three pilot sites and from A1 for the 2<sup>nd</sup> trial phase for the Austrian pilot site.



**Figure 1 - Contact list of the Skype service developed by Philips**



**Figure 2 - Contact list of the Skype service developed by A1**

- **It is where you are** – Skype could be used anywhere, from virtually any device. For example, the elderly’s relatives could use it on their office computer, laptop, tablet computer, or smart phone from anywhere in the world. This is especially handy if they need to be out often for their jobs, as they can still hold their regular calls from wherever they are via Skype, as long as they are connected to the Internet. There is no need to postpone calls just because they are away from their desk.
- **Reliability** - In the early VoIP<sup>2</sup> days, call quality was bad and calls got dropped often. However, VoIP has improved greatly since then and Skype is very reliable. As long as your Internet connection is stable, you can expect your call won’t get dropped. Furthermore, if the Internet connection is bad for any of the parties, Skype will inform users of that, so they know that the call might get dropped. Skype also encourages users to rate their calls when they are done, and Skype is continuously improving the reliability of the service.

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<sup>2</sup> Voice over IP

- **Call quality** - Calls both to other Skype users and landlines are crystal clear, so long as the caller has a good headset with a high quality microphone. Calls to landlines and cell phones get connected quickly, and do not usually suffer from problems such as echoing or words getting cut off. For the most part, it feels like users are talking to someone just next to them.

#### **4. Qualitative assessment of the Skype use among the elderly in the context of the HOMEdotOLD project**

This section summarizes the findings of the two trial phases, which are conducted within the scope of the HOMEdotOLD project in order to evaluate the Skype use among the elderly. The trial activities consisted of:

- **Phase I:** Initial platform operation and evaluation (so as to be able to test the platform functionality and efficiency)
- **Phase II:** HOMEdotOLD preproduct prototype operation and evaluation (Full platform and services)

##### **4.1. Participants & materials**

Both phases are conducted in three pilot sites: Austria, Hellas and Netherlands. The evaluation during the first trial phase was done with overall 60 participants who belonged to the end user group of elderly people. Therefore the system was installed centrally in the premises of LIFEtool (AUT), Society 3/3 (GR) and NFE (NL). Regarding the second trial phase the evaluation is planned with 50 probands. For this purpose the system was installed centrally in the premises of the pilot organizations and in 21 individual households. The functional prototypes were all tested with TV sets with Net-TV functionality or with TV sets and set-up boxes.

## **4.2. Methodology**

### **4.2.1. Testing procedure**

Given that during the 2<sup>nd</sup> trial phase, the Skype service is placed in the users' homes, all the information about realistic use was needed during the 1<sup>st</sup> evaluation cycle. Usability problems that could stop the elderly user from understanding or working with the service were of special importance.

The researchers were therefore instructed to interfere as little as possible during the testing in the 1<sup>st</sup> trial phase (it is very tempting to help the participant when they “got stuck”). Especially testing with the elderly users is difficult because they tend to ask for confirmation a lot instead of “just trying out”. However, the evaluators were instructed to try to refrain from helping them because in the end, nobody will be there in their homes to help them either. In fact, when the users “got stuck”, the researcher observed their actions carefully. Exactly those moments gave the developers the most important results, so one could understand the way they are trying to work with Skype. As a result during the 2<sup>nd</sup> trial phase the TV sets are installed in the houses of the participants for the duration of about a month and the participants are free to use any feature. This enabled us to obtain a view about the users' natural reaction to the service.

## **4.3. Measurements**

### **4.3.1. Think Aloud**

For the 1<sup>st</sup> evaluation study, the evaluators used the “think aloud” procedure to capture qualitative research data. This information was used to identify usability problems which need to be addressed by the developers.



### **4.3.2. Observations**

Given the large number of participants in the 1st evaluation cycle, it would have cost too much time to do a thorough analysis of log files or recording audio and video data. Therefore, it was very important for the researchers of each pilot site to take notes while the participants were performing the tasks defined for them.

### **4.3.3. Questionnaire**

For the 1<sup>st</sup> evaluation study, all three pilot sites made use of the ASQ<sup>3</sup> and PSSUQ<sup>4</sup> questionnaires to measure different aspects of usability on a 7-point scale ranging from “Completely disagree” to “Completely agree”.

The ASQ consisted of three questions. After every task, the participant was asked to answer these questions on a questionnaire form. These questions referred to the task that the participant just finished. The evaluators were instructed to constantly remind to the user that these questions should be answered as to how the participant just experienced the execution of the task, and not how they think they would perform after “getting used” to the system. The ASQ scores provided an indication of which tasks were most problematic for participants to execute.

The PSSUQ are standardized questionnaire’s to determine a user’s satisfaction with a product or interface. This questionnaire provided an overall measurement for the usability. These questionnaires have been used during the 1<sup>st</sup> and 2<sup>nd</sup> trial of the usability tests. This allows checking if the initial reactions to the interface were similar to those of the 2<sup>nd</sup> trial and if improvements have been made.

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<sup>3</sup> Ages & Stages Questionnaires

<sup>4</sup> Post-Study System Usability Questionnaire

#### **4.3.4. Perceived functionality**

These are based on the original questionnaires used for the TAM<sup>5</sup> in the 2<sup>nd</sup> trial phase. The functionality of the service was measured on its basic functions, as well as its effect on reducing loneliness. The perceived functionality of the service is based on how well a participant believes the service reduces loneliness on a 7-point scale ranging from “Completely disagree” to “Completely agree”.

#### **4.4. Analysis & Results**

It turned out that the TV-set is the right medium for the elderly in terms of display resolution because often visual impairments exist. Apart from that the handling through the remote control is also easy operable and learnable for the target group. Skype was the application that the users loved the most of the HOME dot OLD services. A lot of them stated that they would like to use the application on a regular basis. They also said that this service would be perfect to communicate if they were bed-ridden in order to prevent them from loneliness. Apart from that most of the participants were impressed from the video quality and the idea itself. Only one participant pointed out that this service is not very useful because of being tied to one place when using it. Overall, the interviewees regard this service particularly interesting, useful and easy to handle, bringing them close to their relatives and loved ones.

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<sup>5</sup> Technology Acceptances Model

#### 4.4.1. Questionnaire

##### 4.4.1.1. Combined results of the ASQ questionnaire

Task	Mean	Std. Dev.
Calling a contact that is available in the contacts list.	5,61	1,2
Answering a call while watching TV.	5,78	1,3
Answering a call without activating the camera.	5,76	1,2

**Table 1 - Combined results of the ASQ questionnaire of the 3 pilot sites for the 1st Trial**

##### 4.4.1.2. Results of the PSSUQ questionnaire of the Austrian pilot site

Question	Trial	Mean	Std. Dev.
It was easy to use this service.	1	5,80	1,3
	2	6,25	1,1
On the whole I am satisfied with this service.	1	6,20	1,0
	2	6,50	1,2
I could execute the tasks and scenarios well with this service.	1	5,90	1,3
	2	6,50	1,2

**Table 2 - Results of the PSSUQ questionnaire of the Austrian pilot site**

The table above shows the results of the PSSUQ questionnaire of the Austrian pilot site. The number of participants of the 1<sup>st</sup> trial phase

accounted 29. Due to the fact that the 2<sup>nd</sup> trial is still ongoing, the results of 7 participants who are living in 6 individual households are presented underneath and above. It can be seen that there is an improvement of the scores as a result of the improvements to the service after the 1<sup>st</sup> trial phase.

**4.4.1.3. Partial results of the perceived functionality questionnaire of the Austrian pilot site**

<b>Task</b>	<b>Mean</b>	<b>Std. Dev.</b>
Using the service enhances my social relations.	5,5	1,2
Using the service increases how much I socially engage with others.	6	1,1
Using the service improves the quality of my social engagement.	5,8	1,1
I find the service reduces loneliness.	5,5	1

**Table 3 - Partial results of the perceived functionality questionnaire of the Austrian pilot site**

## 5. Conclusion

It is clearly that it is a fundamental request of elderly to exchange themselves with other humans and to communicate with them. The results of the extensive research which has been conducted in the context of the HOME dot OLD project showed that Skype provides major benefits among others in terms of price, ease of use and reliability for the elderly user. It turned out that the TV Set is the right medium to introduce an easy, intuitive conditioned Skype application to them, because the TV is present in almost all households and most of the elderly users are familiar with its use. The two evaluation studies showed clearly that the Skype service is well received by the participants in order to advance their social interaction, bridging distances and preventing them from isolation and loneliness. However due to the fact that TV's with integrated videoconferencing solutions will become more widely available in the foreseen future, developers should take into account the elderly generation's special needs regarding usability. Understanding user needs and requirements at the beginning of a project helps ensure that the product gets fully adopted by its users.

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