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Abstract: The scope of the current deliverable is to approach the HOMEdotOLD platform from a technical and systemic perspective of view, and gather and analyse the requirements that will lead to and guide through its implementation.

The HOMEdotOLD Consortium consists of:

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NATIONAL FOUNDATION FOR THE ELDERLY	Partner	The Netherlands

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GLOSSARY

A	
AAL	Ambient Assisted Living
ADSL	Asymmetric Digital Subscriber Line
AmI	Ambient Intelligence
API	Application Programming Interface
E	
EJB	Enterprise Java Beans
G	
GUI	Graphical User Interface
H	
HMI	Human-Machine Interface
HTML	Hyper Text Markup Language
HTTP	Hyper-Text Transfer Protocol
HTTPS	Hyper-Text Transfer Protocol Secure
I	
IP	Internet Protocol
IPSec	Internet Protocol Security
M	
MHP	Multimedia Home Platform
P	
PC	Personal Computer
PDA	Personal Digital Assistant
S	
SMS	Short Message Service
SoA	Service-oriented Architecture
SOAP	Simple Object Access Protocol
SSL	Secure Sockets Layer
SSO	Single sign-on
STB	Set-Top-Box
T	
TCP	Transmission Control Protocol
TLS	Transport Layer Security
TTP	Trusted Third Party
U	
USB	Universal Serial Bus

W

Wi-Fi	Wireless network technology
WSDL	Web Services Description Language

X

XML	eXtensible Mark-up Language
XSD	XML Schema Document

1. INTRODUCTION

The HOMEdotOLD project aims to provide a TV-based platform with cost-effective services that will be delivered in a highly personalised and intuitive way and will 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.

HOMEdotOLD will deliver and open platform for services advancing the social interaction of elderly people 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 will include 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:
  - **a "social voluntary work"** service; this service will run in cooperation and under the supervision of social care organisations and will notify 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.
  - **"personalised news headlines"** service, which will provide easy access to news headlines at regional, national, European, worldwide levels, with special emphasis on news that inform the elderly user about the activities of interest (the order and way of presentation of the news headlines will be made in a highly personalised way).
- **Social networking services:** i.e. **services for bridging distances and supporting existing roles**: This service category will include 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, which will allow synchronisation of the elderly's agenda with the agendas of friends and family, receiving notifications about possible common activities that can be performed remotely (such as the three types of activities that follow hereafter) or physically, etc.
  - **"videoconference"** service, which will enable –among others– communication with / story telling to grand children.
  - **"remote dining"** service, which will enable virtual eating together with friends and families.
  - **"photos, videos, experience sharing"** service, which will allow keeping in touch with friends and families and share experiences.

HOMEdotOLD will be primarily based on the Philips NetTV platform and secondarily on the TAAG AonTV platform. More specifically, the whole bouquet of services will be implemented and provided to the users of the Greek and Dutch pilot sites on the Net TV platform, that is used in Philips TV sets, which offers an integrated solution with a built-in Internet connection possibility, so no supplementary device is needed, while a subset of this bouquet of services will be implemented and provided to the users of the Austrian pilot site over the AonTV platform, a digital cable TV platform offering access to TV channels, radio stations, video on demand and other multimedia services.

This document represents the deliverable D2.2 – HOMEdotOLD Specifications, which is the result of Task 2.3 "*HOMEdotOLD Architecture Specification*" in WP2.

1.1 SCOPE

The scope of the current deliverable is to approach the HOMEdotOLD platform from a technical and systemic perspective of view, and gather and analyse the requirements that will lead to and guide through its implementation. More specifically, the scope of the current deliverable is to

- define and analyse the services that will be provided to the end-users, specifying in detail their functional and technical requirements, upon which their development will be based;
- to define and analyse the conceptual architecture of the HOMEdotOLD platform, which will facilitate the provision of the aspired bouquet of services;
- to define in specific the systemic components and modules that will comprise the holistic HOMEdotOLD architecture, and analyse their functional and technical specifications;
- to specify the hardware specifications of the platform;
- to deploy a software implementation plan.

1.2 DELIVERABLE STRUCTURE

The current deliverable comprises of eight (8) chapters.

- Chapter one provides the introduction to the document, and undertakes the analysis of the document scope.
- Chapter two undertakes the analysis of the HOMEdotOLD conceptual architecture, providing an overview of its systemic components.
- Chapter three undertakes the detailed analysis of the proposed HOMEdotOLD bouquet of services. This includes the provision of an overview of the service, specifying the involved actors and the service configuration options, as well the detailed analysis of the functional and technical specifications of the services, including the specifications of the multimodal interfaces of the services, and the specifications of the interfaces of the services with external services, i.e. Skype, Picasa and others.
- Chapter four undertakes the core technical analysis of the HOMEdotOLD architecture. The chapter includes the detailed analysis of the functional and technical specifications of the systemic components and modules that will comprise the holistic HOMEdotOLD architecture and the analysis of the application logic of the aspired services, as well as an analysis of the multimodal interfaces that are used in the HOMEdotOLD platform.
- Chapter five provides the hardware specifications of the HOMEdotOLD platform, namely the hardware infrastructure required to facilitate the provision of the HOMEdotOLD services. This includes the specifications of the hardware both at the “client” and at the “server” side, as well as the specifications of the communication infrastructure.
- Chapter six undertakes the deployment of a software implementation plan, including the HOMEdotOLD data modelling and its analysis, as well as the HOMEdotOLD software implementation and integration plan
- Chapter seven summarises the security measures taken to guarantee the integrity of the exchanged data through the HOMEdotOLD platform.
- Chapter eight concludes the deliverable.

The current deliverable also includes an annex which provides a consolidated mapping matrix between:

1. The Functional and technical requirements of each service.
2. The HOMEdotOLD technical requirements identified and analysed in Deliverable D.2.1

3. The HOMEdotOLD user requirements identified and analysed in Deliverable D.2.1
4. The HOMEdotOLD use cases identified and analysed in Deliverable D.2.1

so as to indicate how each functional and technical requirements has been derived and how user requirements and envisaged use cases have been covered.

1.3 METHODOLOGY

The current deliverable analyses several functional and technical specifications regarding the HOMEdotOLD bouquet of services, and the systemic components and modules that comprise its overall architecture, as well as specifications regarding the hardware and telecommunication infrastructure required to support the provision of these services.

The elicitation of these specifications was based on the user requirements that were collected and analysed in deliverable D.2.1. More specifically, the user requirements were incorporated into the description of the services to be supported by the HOMEdotOLD platform, which were in turn translated into functional and technical specifications of the services. This in turn provided the basis in order to elicit the technical architecture, and the definition of the systemic components and modules that would facilitate the support of these specifications. The aforementioned are graphically illustrated in the following figure:

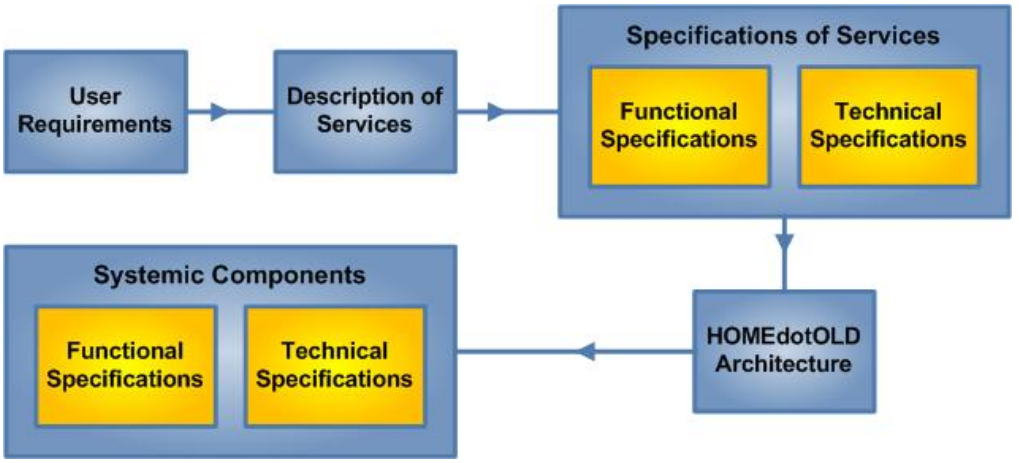

Figure 1: Specifications elicitation methodology

It should be noted that this deliverable is a living document and further updates may be necessary in the course of the project, especially following the completion of the first prototype services and the definition of the initial business models.

2. HOMEDOTOLD CONCEPTUAL ARCHITECTURE

2.1 NETWORK ARCHITECTURE OVERVIEW

The following figure provides an overview of the HOMEdotOLD network architecture.

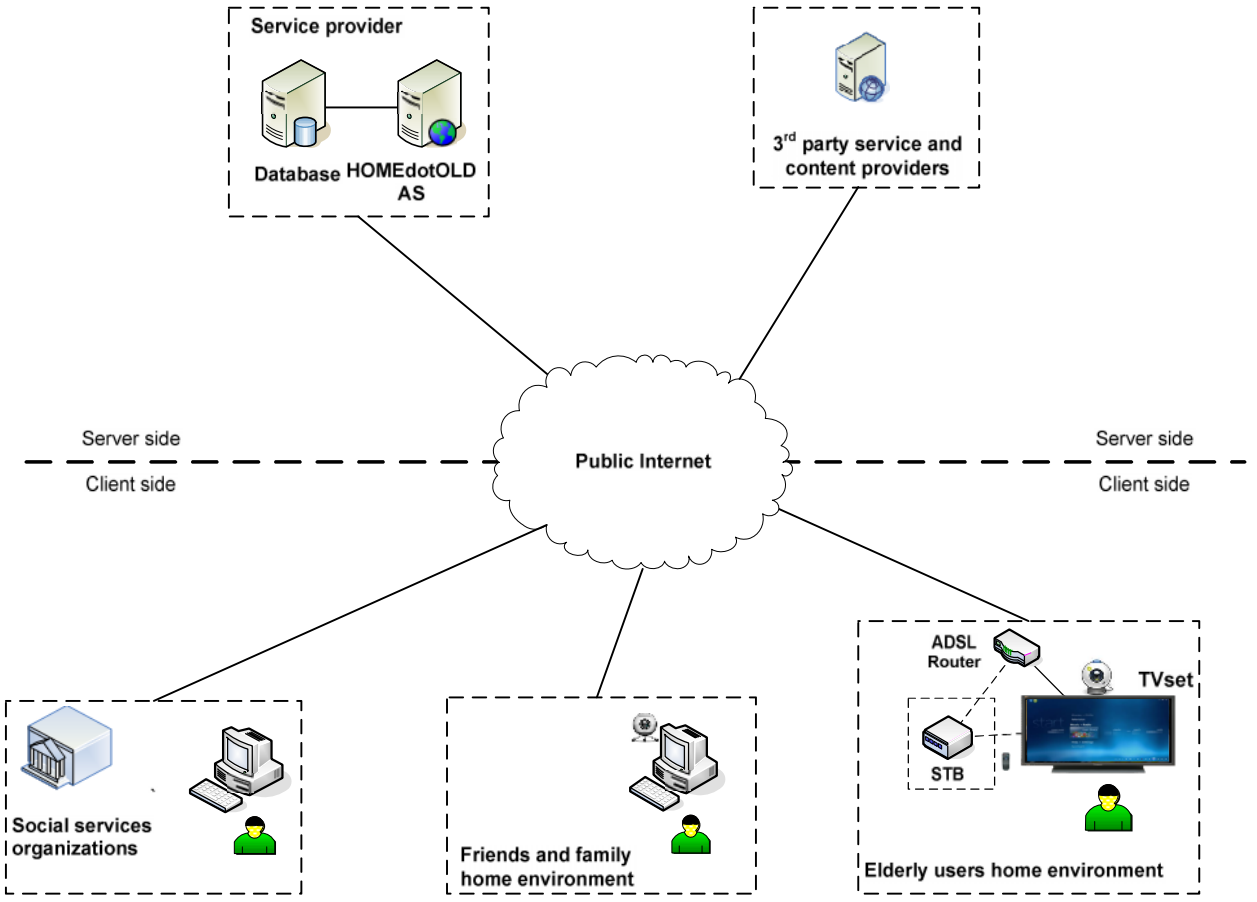

Figure 2: HOMEdotOLD Network Architecture Overview

It consists of 5 main sites including:

- **Service provider,** where the services logic and data reside.
- **3rd party service and content providers** that provide source of information for the news headlines and host the photo and video sharing servers.
- **Social services organisations** that organise an carry out social voluntary work events and notify elderly people about possibilities, by suggesting areas of social voluntary work.
- **Elderly persons/users equipped either with Philips Internet-enabled TVs or the AonTV platform (includes a STB)**, who want to advance their social interaction and improve the quality and joy of their home life. Special focus is on elderly people living far away from their families and close friends.
- **Friends and family** that want to stay connected with the elderly people.

2.2 HOMEDOTOLD SYSTEMIC COMPONENTS

2.2.1 SYSTEMIC COMPONENTS CLIENT-SIDE

Elderly Users Home Environment Equipment

The main systemic hardware components of the HOMEdotOLD platform that will be utilised on the client side are described below:

Equipment	Product	Interfaces
TVset	Philips NetTV	HDMI/SCART, RJ-45
TVset/STB	ADB-3800W	HDMI/SCART, RJ-45
ADSL Router	Thomson 585 v7 / Other	RJ-45

Table 1: Home Environment Equipment

A connection diagram about the home environment equipment is depicted in the following figure.

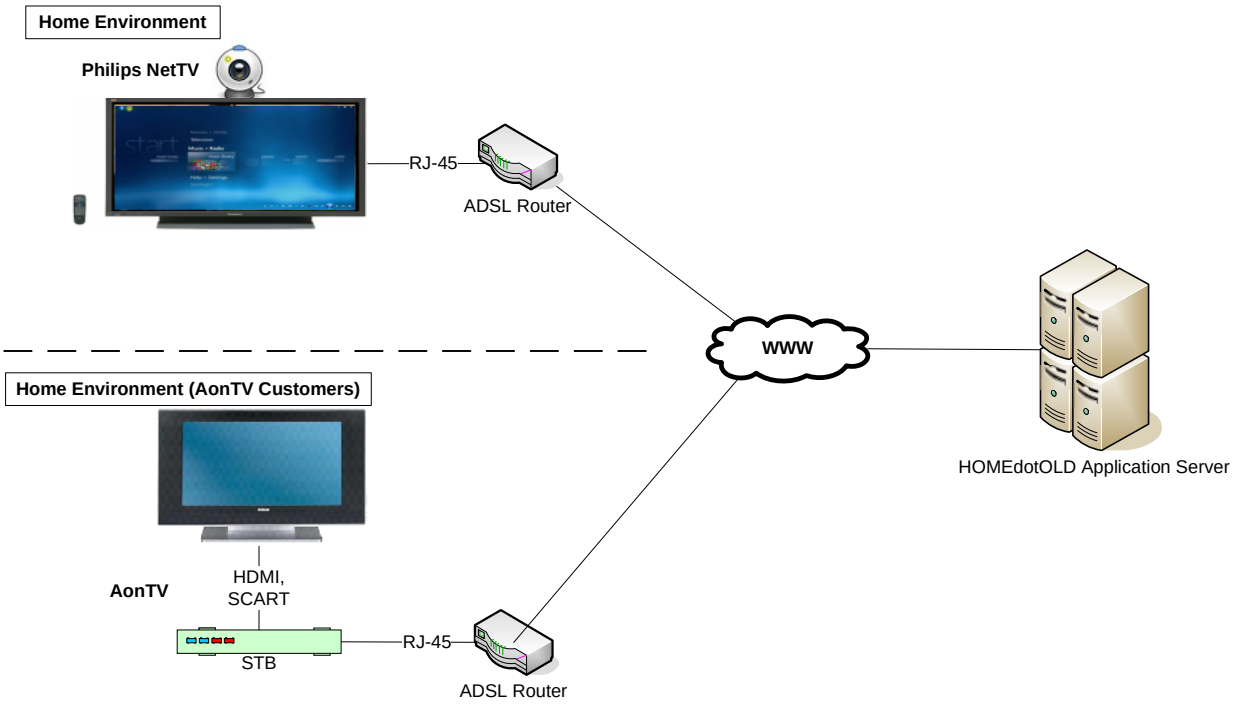

Figure 3: HOMEdotOLD home environment

The home architecture is provided with 2 options to the elderly users:

- Option 1: A Philips NetTV that connects to the Internet directly via the ADSL router.
- Option 2: A standard TV with a STB that is used to access the services.

The elderly user home environment is communicating with the service provider over the Public Internet.

Accessing of the HOMEdotOLD services is done over the TVset using standard remote control, while TVset audio capabilities are used for communication purposes. Regarding support of videoconference service in the elderly home environment, the TV is extended with a laptop

(running Windows 7), an HDMI-CEC command converter box (HDMI-CEC to USB and RS-232 Bridge) and a notebook webcam(Philips SPC 640nc/00). Videoconference services on the friends and family home environment is done over standard PCs with web-cameras.

Other Equipment

Both the friends and family home environment and the social services organizations include standard PCs with Internet connections. Communication with the service provider is done over the Public Internet.

2.2.2 SYSTEMIC COMPONENTS SERVER-SIDE

Service Provider

The service provider hosts the HOMEdotOLD AS and the corresponding database with user data. The elderly home environment, the friends and family home environment and the social services organizations environment are communicating with the service provider over the Public Internet. In cases that the HOMEdotOLD AS is part of an IPTV infrastructure, the communication between the home environment and the service provider is done over a private IP network.

Communication of the HOMEdotOLD AS and the 3rd party service and content providers is done over the Public Internet.

3. SPECIFICATION OF SERVICES

3.1 PERSONAL MOTIVATION SERVICES

Personal motivation services constitute services that will enable the elderly users to stay socially active, that will assist them in preventing loneliness and isolation, and that will enable voluntariness, motivation and activation. This service category incorporates services which allow 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:

- a "**social voluntary work**" service; this service will run in cooperation and under the supervision of social care organisations and will notify 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.
- "**personalised news headlines**" service, which will provide easy access to news headlines at regional, national, European, worldwide levels, with special emphasis on news that inform the elderly user about the activities of interest (the order and way of presentation of the news headlines will be made in a highly personalised way)

3.1.1 SOCIAL VOLUNTARY WORK

The current section provides the specifications of the "social voluntary work" personal motivation service to be supported and implemented in the context of the project.

3.1.1.1 SERVICE OVERVIEW

The Social Voluntary Work service will run in cooperation with and under the supervision of social care organisations and will notify 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.

Participating Actors

The proposed service incorporates three types of actors:

- **Elderly user**: The elderly user is the direct beneficiary of the service. The elderly user registers at specific social voluntary work categories from which s/he wishes to receive notifications as well as the days of the week on which s/he wishes to participate to social voluntary work activities. The elderly user receives notifications for participation in social voluntary work activities belonging to a SVW category in which s/he has registered, and has the option to confirm or reject this invitation.
- **Mentor at work**: The mentor at work is the actual orchestrator of the service. S/He is a member of a social voluntary work organization and is responsible for the organization and/or selection of specific activities where the elderly users may participate. The mentor at work is responsible for communicating with the HOMEdotOLD database administrator, and for providing him/her with the requirements and details of the proposed activity, i.e. date and time, place, and description of the activity.
- **Database administrator**. The database administrator is an invisible mediator between

the HOMEdotOLD end users (elderly users) and the mentors at work from the corresponding social voluntary work organizations. The HOMEdotOLD database administrator is responsible for updating the database with the requirements and details of social voluntary work activities proposed by the mentors at work.

Service Configuration

The elderly user must be able to configure the service. The configuration of the service involves configuration regarding a) the days on which the user wishes to be informed about the social voluntary work activities that take place, as well as b) the categories to which the user wishes to register.

- The user must be able to select the **days** on which s/he wishes to participate to social voluntary work activities. The user should be presented with a calendar in order to set the time period of his interest.
- The user must be able to register and unregister to social voluntary work categories from which s/he will receive notifications. The supported social voluntary work categories should be presented as a drop-down list, through which the user may navigate via up/down buttons and the user should be able to select one or more categories from this list via a selection button from the remote control.

Service workflow

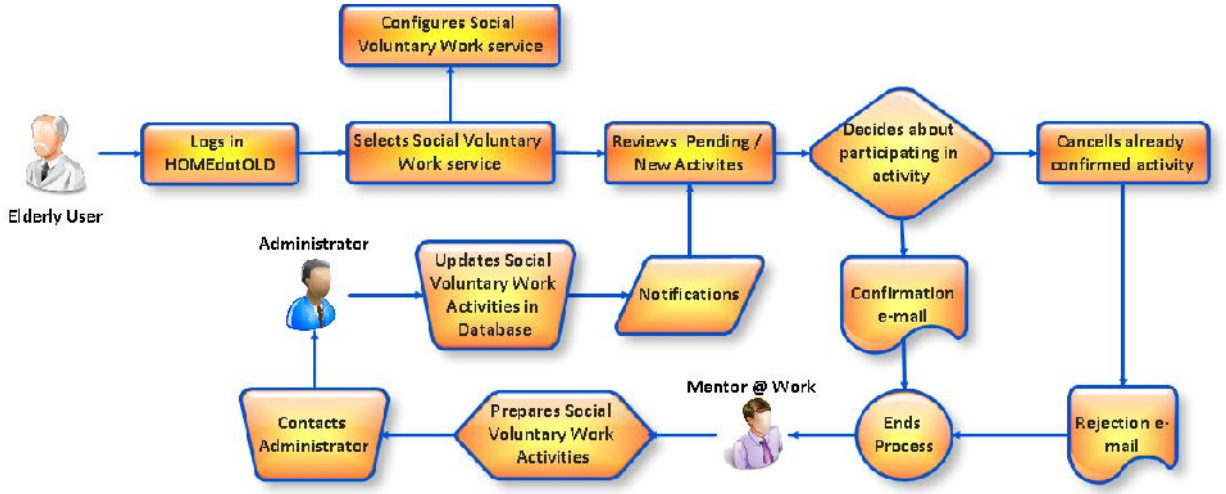

Figure 4: Social Voluntary Work Service Workflow

3.1.1.2 FUNCTIONAL SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the functional specifications of the specific service. The following table is used to describe the functionalities that will be supported for the elderly users:

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW-F-01	Social Voluntary Work service appearance	The selection of the application from the main menu leads to the appearance of a social voluntary work service main page on the user screen. The main page will support a configuration area, from which the user will be able to configure the service, and the main page where the user will be able to navigate through the social voluntary work activities notifications (i.e. upcoming activities)

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW - F-02	Navigation through Social Voluntary Work service	The user is able to navigate through the Social Voluntary Work service interface via back/front or up/down buttons from the remote control and select one or multiple options provided through this interface via a selection button from the remote control.
SVW-F-03	Social Voluntary Work configuration	The user must be able to configure the service. The configuration of the service involves configuration regarding the days of the week on which the user wishes to get informed about the social voluntary work activities that take place, as well as the categories to which the user wishes to register. a) The user must be able to select the days of the week on which s/he wishes get information about the social voluntary work activities. The user is presented with a a calendar in order to set the time period of his interest. b) The user must be able to register and unregister to social voluntary work categories from which s/he will receive notifications. The supported social voluntary work categories will be presented as a drop-down list, through which the user may navigate via up/down buttons and the user will be able to select one or more categories from this list via a selection button from the remote control. The user may then select either “Save changes” in order to validate the process, or “Cancel” in order to fall-back to the prior selections without saving the changes made.
SVW-F-04	Social Voluntary Work configuration confirmation window	Upon selection one or more categories to which the user wishes to register, the system returns a confirmation window, which informs the user that “s/he will participate to social voluntary work activities on *selected* days of the weak, and s/he is now registered to the following social voluntary work activities:”, where the list with his/her registered activities is presented. Once the user accepts the changes made, the system returns a successful registration confirmation (*SVW-F-05*). In case the user rejects the changes made,, s/he is returned to the Social Voluntary Work configuration screen (*SVW-F-03*).
SVW-F-05	Social Voluntary Work configuration confirmation	Once the user accepts the changes made, the system returns a successful configuration confirmation. The user profile is updated, and thus s/he receives information and updates about social voluntary work activities belonging to the categories selected.
SVW-F-06	Social Voluntary Work activity updates	The social voluntary work activity update is not an automated process. A selection of the most suitable SVW activities first takes place by the social voluntary work organizations mentors. They in turn contact the HOMEdotOLD system administrator, who uses an administrator interface to update the database with the corresponding information which includes:

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
		a) the social voluntary work category to which the specific activity belongs b) a short description of the SVW activity c) the place where the SVW activity takes place d) The date and time when the SVW activity takes place
SVW-F-07	Social Voluntary Work service notifications appearance	The SVW service must support the appearance of new notifications. The notifications (i.e. about upcoming activities) should be displayed in the main page of the service. They must be easily distinguishable by the users. The notifications should be listed according to the date on which they will take place.
SVW-F-08	New Social Voluntary Work service notification	A new social voluntary work service notification is generated each time the system administrator updates the database, and the category to which the specific activity belongs matches the activities to which the users are registered. The new notifications appear both on the intelligent calendar as well as through the SVW service interface. The new SVW service notification screen incorporates a “Category” field, informing the user about the category to which the specific activity belongs, a "Date" field, which informs the user about the date and time on which the new SVW activity will take place, a “Place” field, informing the user about the place in which the specific activity will take place, and a “Description” field that provides the user with a short description of the upcoming event. The user then may select the "Confirmation" option which leads him/her to *SVW-F-09*.
SVW-F-09	New Social Voluntary Work service confirmation window	Once the user is informed about the upcoming event, s/he may select the "Confirmation" option, which leads him/her to a new screen, prompting him/her to either: a) Confirm participation to the upcoming event. In this case, the mentor at work automatically receives a notification e-mail about the user’s participation to the forthcoming activity. In addition, the event is added to the user’s intelligent calendar (*SVW-F-10*). b) Reject participation to the upcoming event. No responses are sent in this case. In this case, the mentor at work automatically receives a notification e-mail about the user’s decline of participation to the forthcoming activity. c) Think it over. This option allows the user to think about whether s/he will participate to the upcoming event, and decide at a later stage. No responses are sent, while the activity remains in the notification window (*SVW-F-11*).
SVW-F-10	New Social Voluntary Work service confirmation	Once the user selects the "Confirm Participation" option to proceed with confirming his/her participation to the upcoming social voluntary work activity (*SVW-F-09*): a) The new event is registered on the user’s intelligent calendar b) A notification e-mail about the user’s participation to the

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
		forthcoming activity is automatically sent to the corresponding mentor at work.
SVW-F-11	New Social Voluntary Work Pending Activity	If a user selects to "Think it over" (*SVW-F-09*), the social voluntary work is registered as pending and is both registered on the user's intelligent calendar as a new pending event, as well as on the SVW service notification area. Pending events remain in the notification area of the SVW service in order to prompt the user that they require their interaction with them. Upon selection of the specific event, the New Social Voluntary Work service notification screen (*SVW-F-08*) appears and the user may select one of the three choices once more, namely to accept, reject, or think over SVW activity invitation.
SVW-F-11	Social Voluntary Work Pending Activity Participation Change	A user may be entitled to change his mind as regards his/her participation to an upcoming social voluntary work activity. For this reason, whether a new SVW activity at which the user has registered appears on the SVW service notification area, or at his/her intelligent calendar, the selection of this activity opens the SVW Activity Description, incorporating a "Category" field, informing the user about the category to which the specific activity belongs, a "Date" field, which informs the user about the date and time on which the new SVW activity will take place, a "Place" field, informing the user about the place in which the specific activity will take place, a "Description" field that provides the user with a short description of the upcoming event, a "Status" field, reminding the user his selection as regards his participation in the activity, as well as three choices, namely to accept, reject, or think over SVW activity invitation. The selection follows a confirmation window, where the user is informed about his response.

Table 2: "Social Voluntary Work" service functional specifications

3.1.1.3 TECHNICAL SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the technical specifications of the specific service. The following table is used to describe the functionalities that will be supported by the specific service::

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW-TS-01	Security	The service should support personal data protection. This should be addressed by the telecommunication security (transport layer) and RDBMS encryption (data layer) mechanisms.
SVW - TS-02	Performance	The service should be 99,9% reliable and support low utilisation of the Application Server resources
SVW - TS-03	Role management	The RDBMS must be user-based and support role management that will allow for services configuration.

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW - TS-04	Asynchronous communication	Service must support asynchronous communication for the exchange of notifications and responses amongst the users. Synchronous communication is not required.
SVW - TS-05	Text input	System must support keyboard editing widgets/libraries
SVW - TS-06	Database homogenisation	A normalised entity relationship model must be developed that will support transparent to the user communication between: a) a user and his network (i.e. during selection of recipient(s) for a new event), b) a user and his notifications, c) a user and his interests, d) services (i.e. social voluntary work activities and intelligent calendar notifications)
SVW - TS-07	External communication	The Social Voluntary Work service must support communication with internal services, i.e. the Intelligent Calendar service, notifying about upcoming events or activities that a user may be interested in.

Table 3: "Social Voluntary Work" service technical specifications

3.1.1.4 MULTIMODAL INTERFACES SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the functional specifications of the multimodal interfaces of the specific service. The following table is used to describe the functionalities that will be supported by these interfaces:

Social Voluntary Work	
Spec. ID	**Specification Description**
SVW-MIFS-1	The elderly user is provided with a web-based interface utilised for the visualisation of the service.
SVW-MIFS-2	The user is able to navigate through the SVW service web-based interface via back/front or up/down buttons from the remote control and select one or multiple option(s) provided through this interface via a selection button from the remote control. The user is also able to navigate through the screen with the use of a pointing device and select specific option(s) with the use of the same device.
SVW-MIFS-3	The elderly user may interact with the SVW service through TTS functionalities

Table 4: "Social Voluntary Work" service multimodal interface functional specifications

The following table is used to describe the technical specifications that will be supported by these interfaces :

Social Voluntary Work	
Spec. ID	**Specification Description**
SVW-MITS-1	The SVW multimodal interface must support TTS functionalities.

Table 5: "Social Voluntary Work" service multimodal interface technical specifications

3.1.1.5 SPECIFICATIONS OF INTERFACES OF THE SERVICE WITH EXTERNAL SERVICES

The current section provides an analytical description of the functional specifications of the interfaces of the specific service with external services. The following table is used to describe the functionalities that will be supported by these interfaces:

Social Voluntary Work	
Spec. ID	**Specification Description**
SVW-IESFS-1	In the case an elderly user confirms or cancels participation to an upcoming event, a notification e-mail is automatically sent to the corresponding mentor at work.

Table 6: "Social Voluntary Work" service interface with external services functional specifications

The following table is used to describe the technical specifications that will be supported by the interfaces of the specific service with external services:

Social Voluntary Work	
Spec. ID	**Specification Description**
SVW-IESTS-1	The service should utilise a mail client for the automatic delivery of an auto-generated message to a pre-selected list of recipients

Table 7: "Social Voluntary Work" service interface with external services technical specifications

3.1.2 PERSONALISED NEWS HEADLINES

3.1.2.1 SERVICE OVERVIEW

This service provides easy access to news headlines with special emphasis on news that inform the elderly people about the activities of interest. The Application Server, through the use of RSS technology, extracts news content from prestigious web sites and displays the content to the elderly people.

A set of such websites supporting this technology is selected taking into consideration the elderly user requirements. The order and way of presentation of the news headlines can be made in a highly personalised way based on user preferences that are made available by the HOMEdotOLD personalisation framework.

The following figure shows an architecture diagram depicting also the stakeholders of this service.

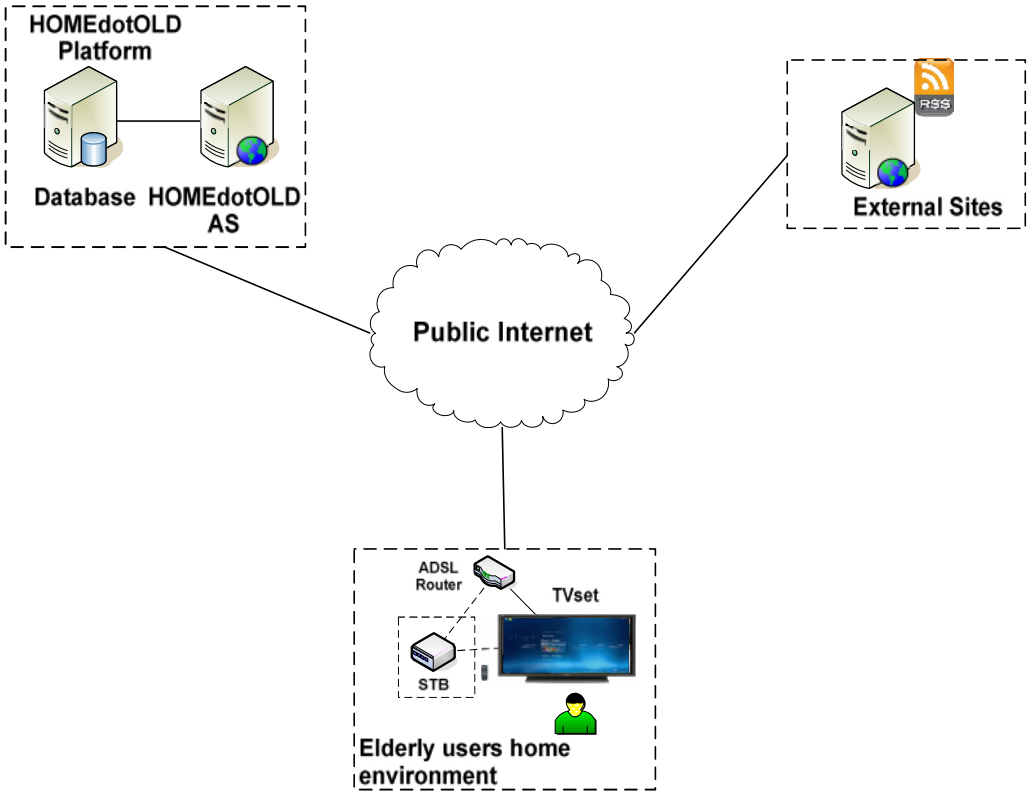

Figure 5: "Personalised News Headlines" service network architecture overview

The following sections provide in detail the required service configuration and service operation.

3.1.2.1.1 SERVICE CONFIGURATION

System Administrator / Service provider

- The system administrator belongs to the service provider, which commercially exploits the HOMEdotOLD platform and its services. The system administrator registers the elderly person profile to the Application Server, which includes the following information:
- ID
- Name and Surname
- Age
- Postal Address

The system administrator provides the elderly person with a Personal Identification Number (PIN) for service access through the Philips internet-enabled TV or STB/TVset.

The system administrator also maintains a set of websites that support RSS technology, from which news headlines can be retrieved.

Elderly / Home environment

- The service provider makes the appropriate equipment installations to the elderly home environment. The elderly user is provided with a PIN for being able to access the HOMEdotOLD platform and its services through a Philips internet-enabled TV or an STB/TVset (AonTV).
- The elderly user logs in to the HOMEdotOLD platform and navigates to the configuration page of the "Personalised News Headlines" service using the remote

control.

A list of predefined categories is presented to choose from including:

- Politics
- Business
- Economy
- Science
- Sports
- Culture
- Travel
- Health
- Showbiz & Lifestyle
- Royalty
- Garden
- Cars
- Food & Cooking
- Weather
- Film
- Photography
- Music
- Books
- Nature
- History

After the elderly user has selected the level and kind of information wishing to view/follow up, their preferences are stored in the database.

3.1.2.1.2 SERVICE OPERATION

Accessing the headlines

The elderly user logins to the HOMEdotOLD platform and navigates to the "Personalised News Headlines" service using the remote control. Based on the particular elderly user service configuration parameters, he/she is presented with a list of topics to choose from. The elderly user selects the topic and the content of the selected topic is presented to him/her. The service is personalised based on the user feedback about its mood status. This is performed by presenting the user with the respective news headlines categories.

Accessing news headlines sites by the Application Server

The Application Server is able to "know" when prestigious web sites have added new content (text, pictures and videos) and store it in the corresponding service context for the particular elderly user. Based on the user preferences, the selected news categories and the associated news headlines are presented to the end uer. the order and way of presentation of the news headlines are made available to the user in a highly personalised way.

Service workflow

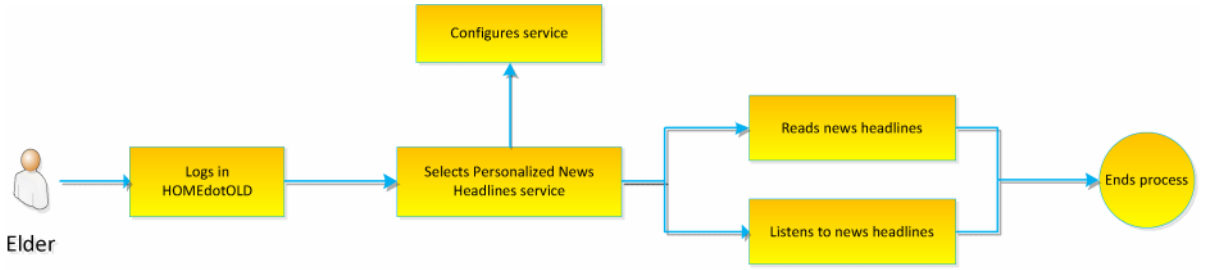

Figure 6: Personalized News Headlines Service workflow

3.1.2.2 FUNCTIONAL SPECIFICATIONS OF THE SERVICE

The following table provides an analytical description of the functional specification of the

"Personalised News Headlines" service from the administrator perspective.

"Personalised News Headlines"	
Code	**Functional Specification Description** (further details can be found in D42, section 5)
PNH-FS-A1	The administrator logins to the HOMEdotOLD system through standard PC.
PNH-FS-A2	The administrator selects whether he/she wants to add/edit users and/or prestigious web sites supporting RSS technology.
PNH-FS-A3	The administrator creates/edits new/existing user.
PNH-FS-A4	The administrator creates/edits new/existing categories of interest.
PNH-FS-A5	The administrator creates/edits new/existing web sites supporting RSS technology.

Table 8: "Personalised News Headlines" service administrator functional specification

The following table provides an analytical description of the functional specification of the "Personalised News Headlines" service from the elderly person perspective.

"Personalised News Headlines"	
Code	**Functional Specification Description**
PNH-FS-E1	The elderly person logins to the HOMEdotOLD system through a Philips NetTV or a TVset, set-top box (AonTV) and a normal remote control.
PNH-FS-E2	Upon successful authentication, the elderly person is presented with the HOMEdotOLD services main page.
PNH-FS-E3	The elderly person chooses to access the "Personalised News Headlines" service by selecting the "News Headlines" button of the service HMI and pressing the "OK" button on the remote control. The "Personalised News Headlines" service page is presented on the elderly person TV screen.
PNH-FS-E4	The elderly person is presented with a choice of "Read the news" and "Customize" buttons.
PNH-FS-E5	The service customization page presents some predefined categories of interests (Politics, Business, Economy, Science, Sports, Culture, Travel, Health, Showbiz & Lifestyle, Royalty, Garden, Cars, Food & Cooking, Weather, Film, Photography, Music, Books, Nature, History).
PNH-FS-E6	The "Read the News" service page presents a selection of categories, each one with a summary of proposed topics based on the preferences of the user.

Table 9: "Personalised News Headlines" service user functional specification

3.1.2.3 TECHNICAL SPECIFICATIONS OF THE SERVICE

In this section the HOMEdotOLD "Personalised News Headlines" service architecture is presented, showing the different sub-systems and their position within the application server.

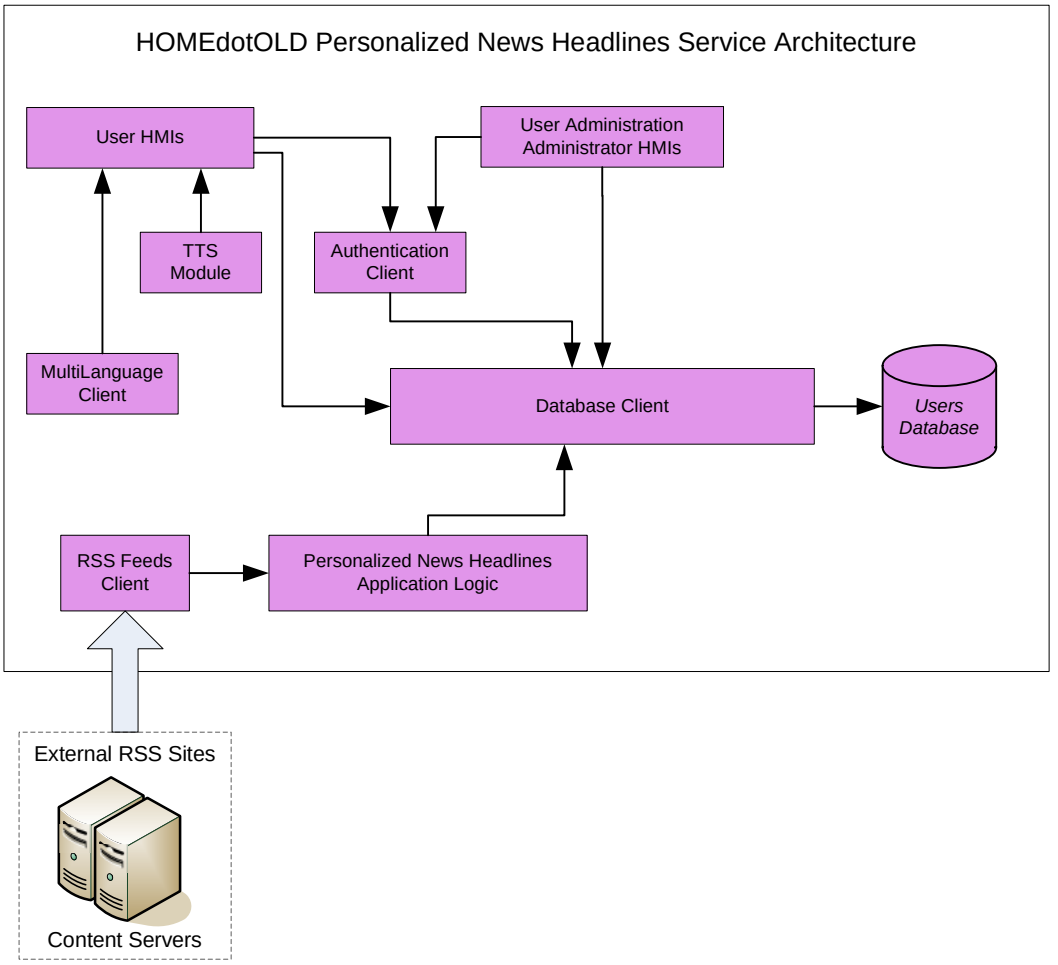

Figure 7: "Personalised News Headlines" service architecture

The following table provides an analytical description of the technical specification of the "Personalised News Headlines" service.

"Personalised News Headlines"	
Code	**Technical Specification Description**
PNH-TS-1	The **User HMIs** groups all HMIs needed by the elderly users in order to access and configure the service. The module is Web4CE compliant.
PNH-TS-2	The **User Administration HMI** groups all HMIs needed in order to manage the elderly users. The module is based on JSP technology.
PNH-TS-3	The **DatabaseClient Module** utilises the Hibernate framework providing the interface to the *Users* database and their tables/columns. The module is based on Java technology.
PNH-TS-4	The **Authentication** *Client* is responsible to authenticate the user based on the user unique ID and PIN and then based on the user unique ID retrieve list of subscribed services. The module is based on Java technology.
PNH-TS-5	The **RSS Feeds** *Client* is responsible for connecting to the requested RSS document URL and obtaining a list of RSS feeds that can be displayed to the user. The module is based on Java technology.

PNH-TS-6	The **Personalised News Headlines Application Logic** is responsible for obtaining the sources of information, based on the service configuration parameters, that is then passed to the RSS Feeds Module. The module is based on Java technology.
PNH-TS-7	The **TTS Module** is responsible for generating / playing audio notifications according to the selected UI element.
PNH-TS-8	The **MultiLanguage Client** is responsible for providing the relevant UI translations in 3-languages, namely: Hellenic, Austrian and Dutch.
PNH-TS-9	Security protocol to protect user data over the Internet is based on HTTPS, SSL.

Table 10: "Personalised News Headlines" service technical specification

3.1.2.4 MULTIMODAL INTERFACES SPECIFICATIONS OF THE SERVICE

The following table provides an analytical description of the functional specifications of the multimodal interfaces of the "Personalised News Headlines" service.

"Personalised News Headlines"	
Code	**Functional Specification Description**
PNH-MIFS-1	The System Administration HMIs allows for elderly users and RSS sites management.
PNH-MIFS-2	The elderly person HMI allows for configuration/personalisation of the service and viewing of selected RSS feeds.
PNH-MIFS-3	Text-To-Speech functionality allows elderly person with visual or auditory impairments to use TV-set audio capabilities for listening to selected RSS feeds.
PNH-MIFS-4	Remote control or equivalent input device(s) is used for service access and navigation.
PNH-MIFS-5	TV-set audio capabilities are used for communication services.

Table 11: "Personalised News Headlines" service multimodal interfaces functional specification

The following table provides an analytical description of the technical specifications of the multimodal interfaces of the "Personalised News Headlines" service.

"Personalised News Headlines"	
Code	**Technical Specification Description**
PNH-MITS-1	The elderly person HMIs are implemented according to HTTP standards and in particular the Web4CE.
PNH-MITS-2	The System Administration HMIs are based on JSP technology.
PNH-MITS-3	As long as the elderly user is logged in the HOMEdotOLD platform, accessing of services does not require repetitive password input.
PNH-MITS-4	The service supports elderly user anonymity. User data in the database are related to a random user ID and not his/her real details.
PNH-MITS-5	User data in the database is protected from unauthorized use. The interfaces to external systems (the web services) never include user identification data (such as their full names), just their IDs. They are

	only known to a Service Provider where a user/customer/account is created and are only handled by the administrator who creates the user account.
PNH-MITS-6	The service multimodal interface must support TTS functionality.

Table 12: "Personalised News Headlines" service multimodal interfaces technical specification

3.1.2.5 SPECIFICATIONS OF INTERFACES OF THE SERVICE WITH EXTERNAL SERVICES

The following table provides an analytical description of the functional specifications of the interfaces of the "Personalised News Headlines" service, with external services.

"Personalised News Headlines"	
Code	**Functional Specification Description**
PNH-IESFS-1	The interface is responsible for handling requests and the relevant responses from the "Personalised News Headlines Application Logic" module related to: a. Connection to specific RSS site, through specific URL b. Extraction of RSS specific information, such as *itemTitle* and *itemDescription*

Table 13: "Personalised News Headlines" service interfaces with external services functional specification

The following table provides an analytical description of the technical specifications of the interfaces of the "Personalised News Headlines" service, with external services.

"Personalised News Headlines"	
Code	**Technical Specification Description**
PNH-IESTS-1	Service is using standard RSS Utilities package (http://java.sun.com/developer/technicalArticles/javaserverpages/rss_utilities/) for communicating with RSS feed sites.

Table 14: "Personalised News Headlines" service interfaces with external services technical specification

3.2 SOCIAL NETWORKING SERVICES

3.2.1 INTELLIGENT CALENDAR

The current section provides the specifications of the "intelligent calendar" social networking service to be supported and implemented in the context of the project.

3.2.1.1 SERVICE OVERVIEW

The Intelligent Calendar service will allow synchronisation of the elderly's agenda with the agendas of friends and family, receiving notifications about possible common activities that can be performed remotely or physically, etc..

Participating Actors

The proposed service incorporates three types of actors:

- **Elderly user**: The elderly user is the direct beneficiary of the service. The elderly user is able to select a specific date from the calendar, either to see arranged events (past or

future), or to arrange a new event/date. The Intelligent Calendar will also serve as a birthday reminder for the elderly. It will check the birth dates of the user's network and will prompt the user to send an automated (prefilled sender & recipient) birthday card to the user's relative/friend.

Service Configuration

The configuration of the service involves configuration regarding the interface of the service. The service will support one interface for the elderly using their TV set and one interface for the younger users using the PC.

Service workflow

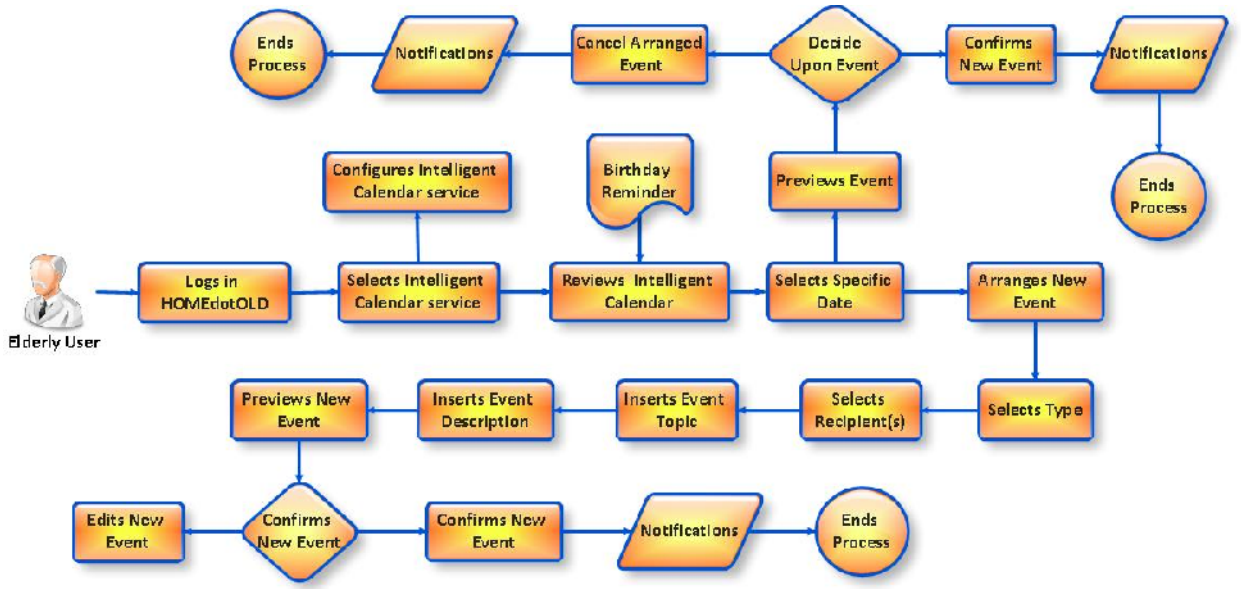

Figure 8: Intelligent Calendar Service Workflow

3.2.1.2 FUNCTIONAL SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the functional specifications of the specific service. The following table is used to describe the functionalities that will be supported for the elderly users:

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
IC-F-01	Intelligent Calendar appearance	The selection of the application from the main menu leads to the appearance of an intelligent calendar on the user screen.
IC-F-02	Intelligent Calendar configuration	Service configuration is realized automatically. It must support one interface for the elderly using their TV set and one interface for the younger users using the PC.
IC-F-03	Navigation through calendar	The user is able to navigate through the intelligent calendar either via back/front buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). The user is also able to navigate through the screen with the use of a pointing device and select specific option(s) with the use of the same device.

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
IC-F-04	Date selection	The user is able to select a specific date from the calendar, either to see arranged events (past or future), or to arrange a new event/date. The user is able to select a specific date from the intelligent calendar either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). A new screen appears inquiring what the user wishes to do (preview events or arrange events), between which the user may navigate either via back/front buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC).
IC-F-05	Event preview	The user is able to preview events that are either pending or have already been arranged on a specific date. Upon selection of the "preview events" choice regarding the specific date (*IC-F-04*), the pending and/or arranged event(s) appear(s) on the screen. In the case of multiple events the user may navigate via front buttons from the remote control (elderly user using TV). The use of the back button returns the user to the previous interface. The same applies for the younger users using PC, who navigate via keyboard & mouse. Pending events are examined in *IC-F-14*.
IC-F-06	Event arrangement	The user is able to arrange a new event/date. Upon selection of the "arrange event" choice regarding the specific date (*IC-F-04*), the "arrange event" series of forms appear on the user screen, corresponding to *IC-F-07 - IC-F-11*.
IC-F-07	New event type selection	Once the user selects to arrange a new event, he is prompted to select the type of this event. A list of predefined event types is presented on his screen in the form of a drop down list, through which the user may navigate either via up/down buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). The user is able to select one or more types from this list either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). Once the user is through with the selection of the type of the event, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with the selection of the recipients of the event.
IC-F-08	New event arrangement recipient selection	Once the user selects to arrange a new event, he is prompted to select the recipient(s) of his message. A list with his contacts (which are stored in the system) is presented on his screen, through which the user may navigate either via up/down buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). The user is able to select one or more recipients from this list either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		(younger user using PC). Once the user is through with the selection of the recipients, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a topic for the new event.
IC-F-09	New event arrangement topic insertion	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a topic for the new event (*IC-F-08*), the "insert topic" form appears on the user screen. The user is able to write free text on this form, either via a virtual keyboard that appears on his/her screen (elderly user using TV) or via keyboard & mouse (younger user using PC). In the case of the elderly user, s/he may navigate via back/front buttons and select characters via a selection button from the remote control. Once the user is through with the insertion of the topic, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a description for the new event.
IC-F-10	New event arrangement description insertion	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a description for the new event (*IC-F-09*), the (optional) "insert description" form appears on the user screen. The user is able to write free text on this form, either via a virtual keyboard that appears on his/her screen (elderly user using TV) or via keyboard & mouse (younger user using PC). In the case of the elderly user, s/he may navigate via back/front buttons and select characters via a selection button from the remote control. Once the user is through with the insertion of the description, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with previewing the new event arrangement.
IC-F-11	New event arrangement preview	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with previewing the new event arrangement (*IC-F-10*), the "preview new arrangement" screen appears on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the user ID, a "To" field that is filled in based on the selections made (*IC-F-08*), a "Topic" field that is filled in based on *IC-F-09* and the (optional) "Description" field that is filled in based on *IC-F-10*. The user then may either select to "Go Back" to previous screens to correct information (in which case the previous steps apply), or to "Confirm Date". In the case of the elderly user, s/he may navigate

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		via left/right buttons between the two options and select one of the two via a selection button from the remote control. Younger users using PC may do so via keyboard & mouse.
IC-F-12	New event arrangement confirmation	Once the user selects the "Confirm Date" option (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with confirming the new event arrangement (*IC-F-11*), the intelligent calendars of the sender and the recipient(s) are synchronised, namely: a) The new pending event is registered on the sender's intelligent calendar b) A notification is sent to each of the recipients
IC-F-13	Notification appearance	The intelligent calendar must support the appearance of new notifications, generated either by the intelligent calendar service itself (i.e. arrangement of a new date, proposal for attending an event made by the IC) or by external services (i.e. a new social voluntary work announcement). The notification must be easily distinguishable by the users (i.e. highlighted with color-coding). New notifications must be given importance. The first upcoming notification should appear upon the service selection.
IC-F-14	Pending event information	Upon selection of the "preview events" choice regarding a specific date (*IC-F-04*), the "new pending event" screen appears on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the sender ID, a "Topic" field and the (optional) "Description" field that are filled in based on the sender's information. The user then may navigate to the "Confirmation" area to either accept or decline the invitation to the new event. The user is able to navifate to the "Confirmation" area either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC).
IC-F-15	Pending event confirmation	Once the user navigates to the "Confirmation" area to either accept or decline the invitation to a new event (*IC-F-04*), s/he may select to "Accept" the invitation, to "Decline" it, or to think it over "Maybe. In the case of the elderly user, s/he may navigate via left/right buttons between the three options and select one of the three via a selection button from the remote control. Younger users using PC may do so via keyboard & mouse. In either case the sender receives a notification of the recipient's choice. If the user selects "Maybe" then the event is registered as pending.
IC-F-16	Reply to new event arrangement notification	Once a user has replied (either has accepted or has declined) another user's invitation, a notification has to be sent to user who has triggered the event. A notification will appear to that user (*IC-F-04*), who may navigate through the intelligent calendar (*IC-F-*

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		05) and preview the event. In this case, the "Arrangement reply" screen will appear on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the sender ID, a "Topic" field that is filled in automatically with the topic of the original event and the "Description" field that informs the user that "User ## has accepted/declined your invitation". The use of the back button returns the user to the previous interface.
IC-F-17	Birthday reminder	The Intelligent Calendar will serve as a birthday reminder for the elderly. It will check the birth dates of the user's network and will prompt the user to send an automated (prefilled sender & recipient) birthday card to the user's relative/friend.
IC-F-18	Pattern matching	The Intelligent Calendar will serve as a pattern-matching tool, which will retrieve the personalized interests of the users (elderly individuals and their network) on the one hand, and information from "social portals" on the other about social events (e.g. music concerts, theatres etc.) in order to make personalized suggestions that match the interests of both the elderly user and one or more individuals belonging to his/her network.

Table 15: "Intelligent Calendar" service functional specifications - User

The following table describes the functionalities that will be supported for the "network" of the elderly, i.e. his relatives:

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
IC-F-01	Intelligent Calendar appearance	The selection of the application from the main menu leads to the appearance of an intelligent calendar on the user screen.
IC-F-02	Intelligent Calendar configuration	The user must be able to configure the interface of the service. It must support one interface for the elderly using their TV set and one interface for the younger users using the PC.
IC-F-03	Navigation through calendar	The user is able to navigate through the intelligent calendar either via back/front buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC).
IC-F-04	Date selection	The user is able to select a specific date from the calendar, either to see arranged events (past or future), or to arrange a new event/date. The user is able to select a specific date from the intelligent calendar either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). A new screen appears inquiring what the user wishes to do (preview events or arrange events), between which the user may navigate either via back/front buttons from the remote control

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		(elderly user using TV) or via keyboard & mouse (younger user using PC).
IC-F-05	Event preview	The user is able to preview events that are either pending or have already been arranged on a specific date. Upon selection of the "preview events" choice regarding the specific date (*IC-F-04*), the pending and/or arranged event(s) appear(s) on the screen. In the case of multiple events the user may navigate via front buttons from the remote control (elderly user using TV). The use of the back button returns the user to the previous interface. The same applies for the younger users using PC, who navigate via keyboard & mouse. Pending events are examined in *IC-F-14*.
IC-F-06	Event arrangement	The user is able to arrange a new event/date. Upon selection of the "arrange event" choice regarding the specific date (*IC-F-04*), the "arrange event" series of forms appear on the user screen, corresponding to *IC-F-07 - IC-F-11*.
IC-F-07	New event type selection	Once the user selects to arrange a new event, he is prompted to select the type of this event. A list of predefined event types is presented on his screen in the form of a drop down list, through which the user may navigate either via up/down buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). The user is able to select one or more types from this list either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). Once the user is through with the selection of the type of the event, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with the selection of the recipients of the event.
IC-F-08	New event arrangement recipient selection	Once the user selects to arrange a new event, he is prompted to select the recipient(s) of his message. A list with his contacts (which are stored in the system) is presented on his screen, through which the user may navigate either via up/down buttons from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). The user is able to select one or more recipients from this list either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC). Once the user is through with the selection of the recipients, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a topic for the new event.
IC-F-09	New event arrangement topic insertion	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a topic for the

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		new event (*IC-F-08*), the "insert topic" form appears on the user screen. The user is able to write free text on this form, either via a virtual keyboard that appears on his/her screen (elderly user using TV) or via keyboard & mouse (younger user using PC). In the case of the elderly user, s/he may navigate via back/front buttons and select characters via a selection button from the remote control. Once the user is through with the insertion of the topic, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a description for the new event.
IC-F-10	New event arrangement description insertion	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with inserting a description for the new event (*IC-F-09*), the (optional) "insert description" form appears on the user screen. The user is able to write free text on this form, either via a virtual keyboard that appears on his/her screen (elderly user using TV) or via keyboard & mouse (younger user using PC). In the case of the elderly user, s/he may navigate via back/front buttons and select characters via a selection button from the remote control. Once the user is through with the insertion of the description, s/he selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with previewing the new event arrangement.
IC-F-11	New event arrangement preview	Once the user selects next (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with previewing the new event arrangement (*IC-F-10*), the "preview new arrangement" screen appears on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the user ID, a "To" field that is filled in based on the selections made (*IC-F-08*), a "Topic" field that is filled in based on *IC-F-09* and the (optional) "Description" field that is filled in based on *IC-F-10*. The user then may either select to "Go Back" to previous screens to correct information (in which case the previous steps apply), or to "Confirm Date". In the case of the elderly user, s/he may navigate via left/right buttons between the two options and select one of the two via a selection button from the remote control. Younger users using PC may do so via keyboard & mouse.
IC-F-12	New event arrangement confirmation	Once the user selects the "Confirm Date" option (either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC)) to proceed with confirming the new event arrangement (*IC-F-11*), the intelligent calendars of the sender and the recipient(s) are synchronised,

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		namely: a) The new pending event is registered on the sender's intelligent calendar b) A notification is sent to each of the recipients
IC-F-13	Notification appearance	The intelligent calendar must support the appearance of new notifications, generated either by the intelligent calendar service itself (i.e. arrangement of a new date) or by external services (i.e. a new social voluntary work announcement). The notification must be easily distinguishable by the users (i.e. highlighted with color-coding). New notifications must be given importance. The first upcoming notification should appear upon the service selection.
IC-F-14	Pending event information	Upon selection of the "preview events" choice regarding a specific date (*IC-F-04*), the "new pending event" screen appears on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the sender ID, a "Topic" field and the (optional) "Description" field that are filled in based on the sender's information. The user then may select navigate to the "Confirmation" area to either accept or decline the invitation to the new event. The user is able to navigate to the "Confirmation" area either via a selection button from the remote control (elderly user using TV) or via keyboard & mouse (younger user using PC).
IC-F-15	Pending event confirmation	Once the user navigates to the "Confirmation" area to either accept or decline the invitation to a new event (*IC-F-04*), s/he may either select to "Accept" the invitation, to "Decline" it, or to think it over "Maybe. In the case of the elderly user, s/he may navigate via left/right buttons between the three options and select one of the three via a selection button from the remote control. Younger users using PC may do so via keyboard & mouse. In either case the sender receives a notification of the recipient's choice. If the user selects "Maybe" then the event is registered as pending. If an event is registered as pending and the confirmation / arrangement date is passed, then the event continues to appear but with inactive buttons.
IC-F-16	Reply to new event arrangement notification	Once a user has replied (either has accepted or has declined) another user's invitation, a notification has to be sent to user who has triggered the event. A notification will appear to that user (*IC-F-04*), who may navigate through the intelligent calendar (*IC-F-05*) and preview the event. In this case, the "Arrangement reply" screen will appear on the user screen. This new screen incorporates a "Date" field, that is filled in automatically with the selected date, a "From" field that is filled in automatically with the sender ID, a "Topic" field that is filled in automatically with the topic of the original event and the "Description" field that informs the user that

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		"User ## has accepted/declined your invitation". The use of the back button returns the user to the previous interface.
IC-F-17	Birthday reminder	The Intelligent Calendar will serve as a birthday reminder for the elderly. It will check the birth dates of the user's network and will prompt the user to send an automated (prefilled sender & recipient) birthday card to the user's relative/friend.
IC-F-18	Pattern matching	The Intelligent Calendar will serve as a pattern-matching tool, which will retrieve the personalized interests of the users (elderly individuals and their network) on the one hand, and information from "social portals" on the other about social events (e.g. music concerts, theatres etc.) in order to make personalized suggestions that match the interests of both the elderly user and one or more individuals belonging to his/her network.

Table 16: "Intelligent Calendar" service functional specifications - Network

3.2.1.3 TECHNICAL SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the technical specifications of the specific service. The following table is used to describe the technical specifications that will be supported by the service:

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
IC-T-01	Security	The service should support personal data protection. This should be addressed by the telecommunication security (transport layer) and RDBMS encryption (data layer) mechanisms.
IC-T-02	Performance	The service should be 99,9% reliable and support low utilisation of the Application Server resources
IC-T-03	Role management	The RDBMS must be user-based and support role management that will allow for services configuration.
IC-T-04	Asynchronous communication	Service must support asynchronous communication for the exchange of notifications and responses amongst the users. Synchronous communication is not required.
IC-T-05	Text input	System must support keyboard editing widgets/libraries
IC-T-06	Voice support	HMI must provide TTS support
IC-T-07	Database homogenisation	A normalised entity relationship model must be developed that will support transparent to the user communication between: a) a user and his network (i.e. during selection of recipient(s) for a new event), b) a user and his notifications, c) a user and his interests, d) services (i.e. social voluntary work activities and intelligent calendar notifications)
IC-T-08	External communication	The Intelligent Calendar service must support communication with external services, i.e. a social activity portal notifying about

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		upcoming events or activities that a user may be interested in.

Table 17: "Intelligent Calendar" service technical specifications

3.2.1.4 MULTIMODAL INTERFACES SPECIFICATIONS OF THE SERVICE

The current section provides an analytical description of the functional specifications of the multimodal interfaces of the specific service. The following table is used to describe the functionalities that will be supported by these interfaces:

Intelligent Calendar	
Spec. ID	**Specification Description**
IC-MIFS-1	The elderly user is provided with a web-based interface utilised for the visualisation of the service.
IC-MIFS-2	The user is able to navigate through the IC service web-based interface via back/front or up/down buttons from the remote control and select one or multiple option(s) provided through this interface via a selection button from the remote control. The user is also able to navigate through the screen with the use of a pointing device and select specific option(s) with the use of the same device.
IC-MIFS-3	The elderly user may interact with the IC service through TTS and STT functionalities

Table 18: "Intelligent Calendar" service multimodal interface functional specifications

The following table is used to describe the technical specifications that will be supported by these interfaces:

Intelligent Calendar	
Spec. ID	**Specification Description**
IC-MITS-1	The IC multimodal interface must support TTS functionalities.

Table 19: "Intelligent Calendar" service multimodal interface technical specifications

3.2.1.5 SPECIFICATIONS OF INTERFACES OF THE SERVICE WITH EXTERNAL SERVICES

In order to facilitate pattern matching, the Intelligent Calendar service will extract information from external web sites and inform the user about upcoming events, based on his/her interests. More specifically, the Intelligent Calendar service will process/consume the RSS feed of selected web sites and select keywords from the RSS feed content in order to extract information about the type of the upcoming events (i.e. music event, sport event etc.). As soon as the type of the event is defined, the Intelligent Calendar service will match the type of the event with the user preferences, stored into his/her profile. The Intelligent Calendar service will construct an event list based on the user preferences by filtering out events that may not interest the user. The pattern matching functionality will be available in the second version of the prototype.

3.2.2 VIDEOCONFERENCE AND REMOTE DINING

3.2.2.1 *SERVICE OVERVIEW*

The "Videoconference Service", as its name implies, allows elderly users to communicate with friends and families using videoconference calls at an easy and convenient manner for the elderly user, through the TVset. The service enables elderly users living far away to keep in touch with their families and friends and to support their existing roles. The elderly user has the freedom to select the person to call, from a pre-defined contacts list that exists in the corresponding elderly user profile. Contacts are organized alphabetically and presented as big buttons associated with profile information such as contact photo and name.. The amount of information is limited as to not clutter the screen.

Regarding the "Remote Dining Service", from technology aspect is the same to the "Videoconference Service", thus the specification of both services is combined.

Functionalities included in the service are placing a call, (from contact list and from missed calls list), accepting a contact, and answering an incoming call (while using the videoconferencing platform and while using another platform on the TV).

The following figure shows an architecture diagram depicting also the stakeholders of this service.

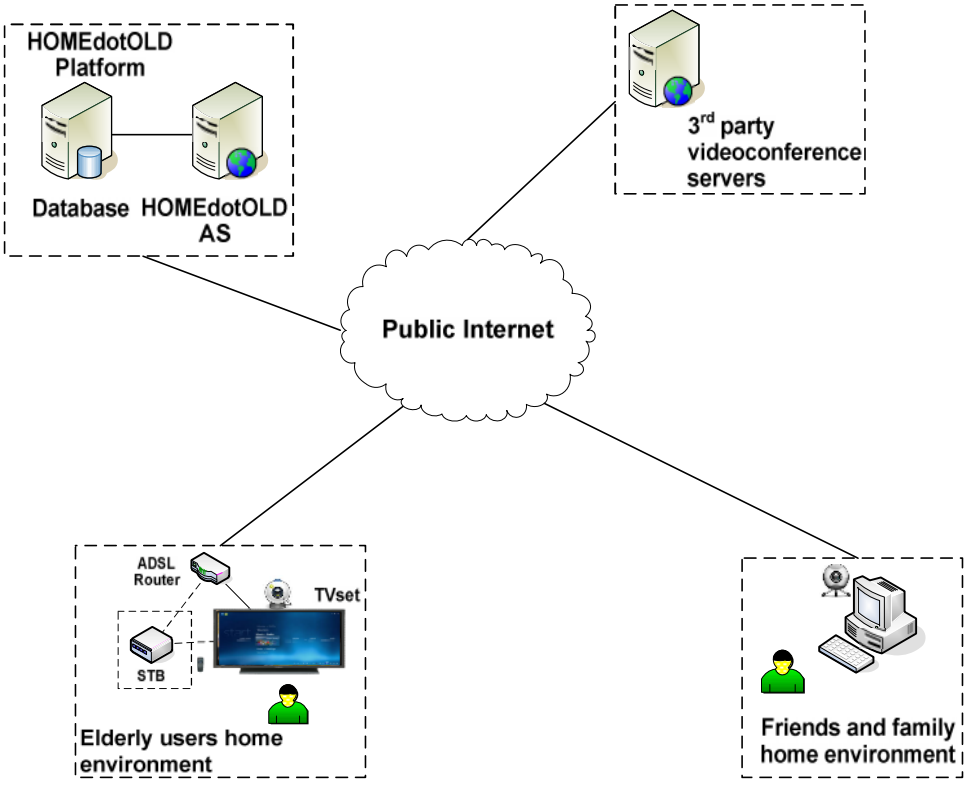

Figure 9: "Videoconference and Remote Dining" service network architecture

The following sections provide in detail the required service configuration and the service operation.

3.2.2.1.1 SERVICE CONFIGURATION

System Administrator / Service provider

The system administrator belongs to the service provider who commercially exploits the HOMEdotOLD results and its services, and registers the elderly person to a 3rd party videoconference service using his/hers profile information and an alias name that is used to identify that person on the 3rd party videoconference network.

The system administrator provides the elderly person with the 3rd party videoconference service alias name and password. However, once the user is logged on to the service once, the user stays logged on until an administrator changes the account on a default third party version of the service running locally on a PC.

Elderly / Home environment

The service provider makes the appropriate equipment installations to the elderly home environment. The service provider logs the user onto the videoconferencing service as part of the setup procedure using the default third party version of the service running locally on a PC. The elderly user is provided with his alias name and password for safekeeping so that future administrators and service providers they trust with their system can configure their account settings using a default third party version of the service running locally on a PC. The elderly user accesses the videoconferencing platform using the remote control.

3.2.2.1.2 SERVICE OPERATION

Elderly / Home environment – Initiating and terminating a call

The elderly user navigates to the "Videoconference and Remote Dining" platform using the remote control.

Based on the particular elderly user contacts list, he/she is presented with a list of contacts that is capable of video calling, including an indication of their availability. The elderly user browses through the contacts using the remote control. Contacts are organized alphabetically and associated with profile information such as contact photo and name. Contacts can add additional information if kept short (a sentence of ca. 25 characters), thus refreshing the elderly memory and providing him/her with topics to discuss when calling.

After finding the required contact the elderly user is allowed to initiate a call, using his/hers remote control. During the videoconference the elderly user can see a video feed of his/her contact If the contact has accepted or initiated a *video*call. Also, the user sees a videofeed of him/herself if they have accepted a *video*call (videocall is the default accept option) or initiated a call (video call is the only option when initiating a call).

While a videoconference is active, the elderly user is allowed to hang-up using the remote control, at which point he/she is presented again with the list of contacts.

Elderly / Home environment – Receiving and terminating a call

While the elderly user is logged in the HOMEdotOLD platform or watching broadcast TV, a pop-up message appears notifying the elderly user that someone is calling him/her. The elderly user through the remote control can either accept or reject the call.

If the call is accepted the elderly user can see a video feed of his/hers interlocutor, on the TVset. While a videoconference is active, the elderly user is allowed to hang-up using the remote control, and to disable/enable videofeed

If the call is not answered a notification message is displayed in the videoconferencing UI informing about the missed call.

Elderly / Home environment – Accepting or rejecting a contact

If someone sends a request to add the elderly user to their contact list. This request is displayed on the videoconferencing UI. The user can select one of the request and consequently can choose to either accept or reject this contact.

Friends and Family / Home environment – Initiating and terminating a call

The elderly person friend or family member uses a PC-based 3rd party videoconference client to

initiate a call to the elderly user.

The way contacts are presented and the way calls are initiated and terminated depends on the selected 3rd party videoconference client functionality.

Friends and Family / Home environment – Receiving and terminating a call

The elderly person friend or family member uses a PC-based 3rd party videoconference client to accept calls from an elderly user.

The way contacts are presented and the way calls are accepted, rejected and terminated depends on the selected 3rd party videoconference client functionality.

3.2.2.2 *FUNCTIONAL SPECIFICATIONS OF THE SERVICE*

The following table provides an analytical description of the functional specification of the "Videoconference and Remote Dining" service from the administrator perspective.

"Videoconference and Remote Dining"	
Code	**Functional Specification Description**
VCRD-FS-A1	The administrator logs in to the HOMEdotOLD system through standard PC using the account information of the elderly user
VCRD-FS-A2	The administrator selects whether he/she wants to add to/edit the elderly user's contactlist.
VCRD-FS-A3	The administrator creates/edits new/existing user.

Table 20: "Videoconference and Remote Dining" service administrator functional specification

The following table provides an analytical description of the functional specification of the "Videoconference and Remote Dining" service from the elderly user perspective.

"Videoconference and Remote Dining"	
Code	**Functional Specification Description**
VCRD-FS-E1	The elderly person accesses the videoconferencing platform on a Philips TV (using their remote control.
VCRD-FS-E2	The "Videoconference and Remote Dining" service page is presented on the user's screen.
VCRD-FS-E3	The elderly person is presented with his/her contactlist with the option to go to missed calls and contact requests
VCRD-FS-E4	The "Videoconference and Remote Dining" service page presents a list of contacts and their availability.
VCRD-FS-E5	Contacts are organized alphabetically and associated with profile information such as contact photo and name If added by the contact a short message is displayed as well.
VCRD-FS-E6	Initiation and termination of videoconference calls, is done through the remote control.
VCRD-FS-E7	The elderly person uses TV-set audio and a separate camera with microphone capabilities for communication purposes.
VCRD-FS-E8	Pop-up messages inform the elderly person that someone wishes to initiate a videoconference call.
VCRD-FS-E9	The elderly person is notified that someone wishes to be added in their contact list through the videoconferencing UI. The elderly person is

	presented with a choice of “accept” and “reject” button options.

Table 21: “Videoconference and Remote Dining” service user functional specification

The following table provides an analytical description of the functional specification of the “Videoconference and Remote Dining” service from the elderly “network” perspective.

“Videoconference and Remote Dining”	
Code	**Functional Specification Description**
VCRD-FS-N1	The elderly person friend/family logs in to 3rd party client videoconference application, this being Skype, from his desktop PC or laptop.
VCRD-FS-N2	The elderly person friend/family navigates through his/her contacts, on the 3rd party videoconference client application contact list and initiates/terminates calls.

Table 22: “Videoconference and Remote Dining” service elderly “network” functional specification

3.2.2.3 *TECHNICAL SPECIFICATIONS OF THE SERVICE*

In this section the HOMEdotOLD “Videoconference and Remote Dining” service architecture is presented, showing the different sub-systems and their position within the application server.

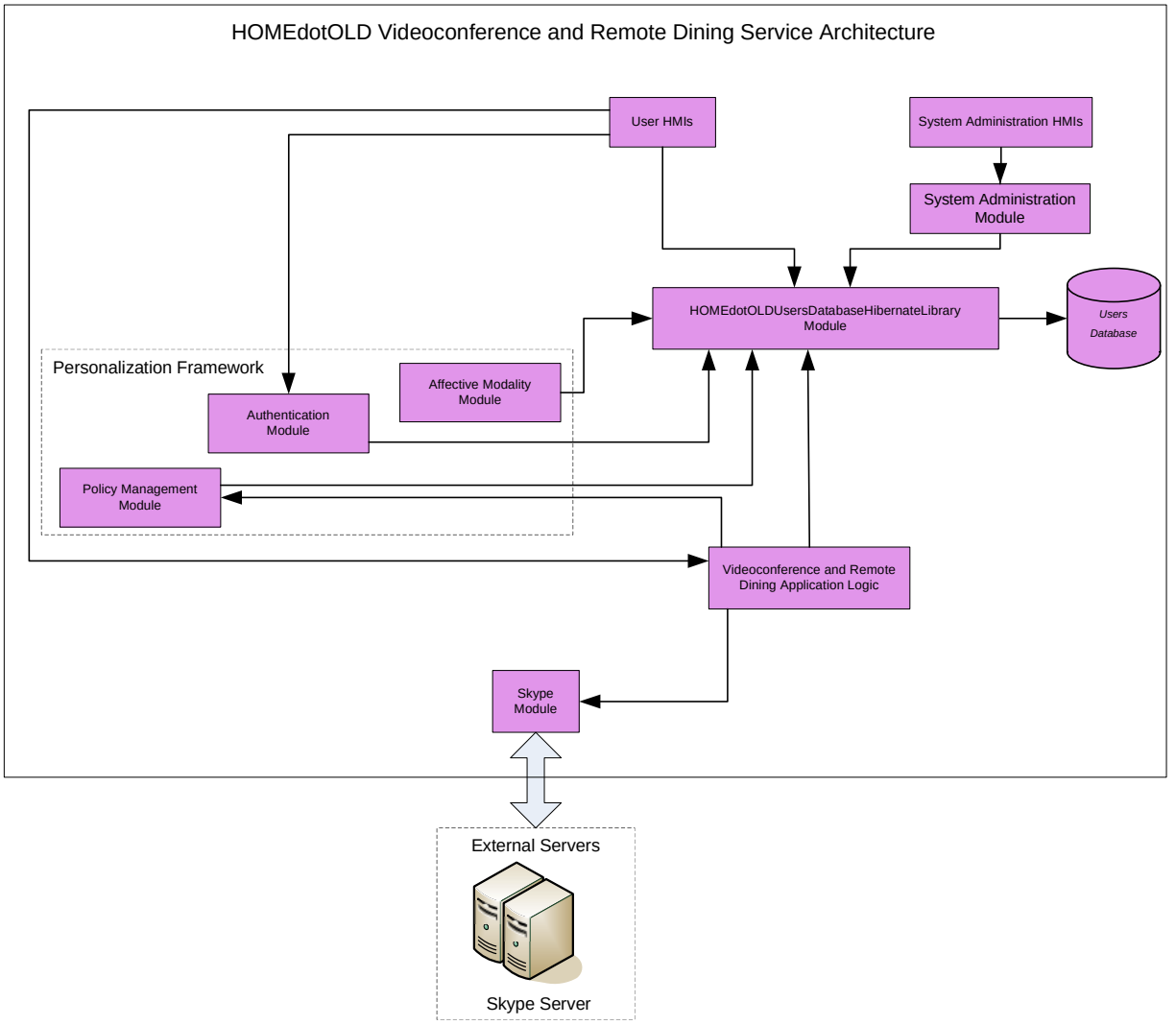

Figure 10: "Videoconference and Remote Dining" service architecture

The following table provides an analytical description of the technical specification of the "Photos, Videos and Experience sharing" service.

"Videoconference and Remote Dining"	
Code	**Technical Specification Description**
VCRD-TS-1	The User HMI of the VCRD service module is based on the Skype4COM API for accessing the Skype client. The module is written in C# and runs on a PC platform.
VCRD-TS-2	The **Skype Module** is responsible for connecting to the Skype network, for a specific elderly via his/hers unique Skype account credentials (username and password) and extracting information regarding his contacts. The module is based on C#, and the Skype4COM API for accessing the Skype network.
VCRD-TS-3	The **Videoconference Application Logic** is responsible for checking whether there are un-answered calls and any pending requests from other platform users to be added to the elderly network.

Table 23: "Videoconference and Remote Dining" service technical specification

3.2.2.4 *MULTIMODAL INTERFACES SPECIFICATIONS OF THE SERVICE*

The following table provides an analytical description of the functional specifications of the multimodal interfaces of the "Videoconference and Remote Dining" service.

"Videoconference and Remote Dining"	
Code	**Functional Specification Description**
VCRD-MIFS-1	Elderly users management is done via a PC-based version of the third party videoconferencing application.
VCRD-MIFS-2	The elderly network PC-based client allows users to make requests to be added to the elderly network as well as to initiate, accept, reject and terminate videoconference calls, in addition to hosting the video stream. It also allows setting of the availability status.
VCRD-MIFS-3	The elderly person is provided with a PC-based (C#) user interface for browsing through contacts. Moreover this interface is responsible for presenting pending requests from other platform users to be added to the elderly network.Finally, this HMI allows for videoconference call management (initiation, acceptance, rejection and termination), in addition to hosting the video stream.
VCRD-MIFS-4	Notification messages, in the videoconferencing UI inform the elderly about missed and incoming calls from their network as well as pending "contact list requests".
VCRD-MIFS-5	Remote control or equivalent input device(s) is used for service access and navigation.
VCRD-MIFS-6	TVset audio capabilities are used for communication services in combination with separate camera and microphone.
VCRD-MIFS-7	Notification messages in the form of a pop-up window inform the elderly about incoming calls when using another part of the TV

	platform than the one hosting the videoconferencing service, i.e. watching broadcast TV, using NetTV or a connected device.

Table 24: "Videoconference and Remote Dining" service multimodal interfaces functional specification

The following table provides an analytical description of the technical specifications of the multimodal interfaces of the "Videoconference and Remote Dining" service.

"Videoconference and Remote Dining"	
Code	**Technical Specification Description**
VCRD-MITS-1	The service is implement in C# and uses UART to HDMI-CEC conversion for control with a TV remote control.
VCRD-MITS-2	Password accessing of services is required upon entering the NetTV platform only, this does not account for the videoconferencing service.
VCRD-MITS-3	The service supports elderly user anonymity.

Table 25: "Videoconference and Remote Dining" service multimodal interfaces technical specification

3.2.2.5 *SPECIFICATIONS OF INTERFACES OF THE SERVICE WITH EXTERNAL SERVICES*

The following table provides an analytical description of the functional specifications of the interfaces of the "Videoconference and Remote Dining" service, with external services.

"Videoconference and Remote Dining"	
Code	**Functional Specification Description**
VCRD-IESFS-1	The interface is responsible for handling requests and the relevant responses from the "Videoconference Application Logic" module related to: a. Authorisation to the Skype network b. Extraction of list of Skype contacts c. Extraction of Skype contacts photo, name and availability status d. Extraction of missed calls e. Extraction of contact requests

Table 26: "Videoconference and Remote Dining" service interfaces with external services functional specification

The following table provides an analytical description of the technical specifications of the interfaces of the "Videoconference and Remote Dining" service, with external services.

"Videoconference and Remote Dining"	
Code	**Technical Specification Description**
VCRD-IESTS-1	Service is using Skype4COM API(http://developer.skype.com/accessories)

Table 27: "Videoconference and Remote Dining" service interfaces with external services technical specification

3.2.3 PHOTOS, VIDEOS, EXPERIENCE SHARING

3.2.3.1 SERVICE OVERVIEW

This service allows elderly people to keep in touch with friends and families and share their

experiences. It provides elderly people with the capability to view photos, videos and associated text located at 3rd party photo and video sharing servers. Shared photos belong to the elder network of users, i.e. elderly relatives/friends with the pre-requisite that the elder user has access to the 3rd party photo and video sharing servers.

The following figure shows an architecture diagram depicting also the stakeholders of this service.

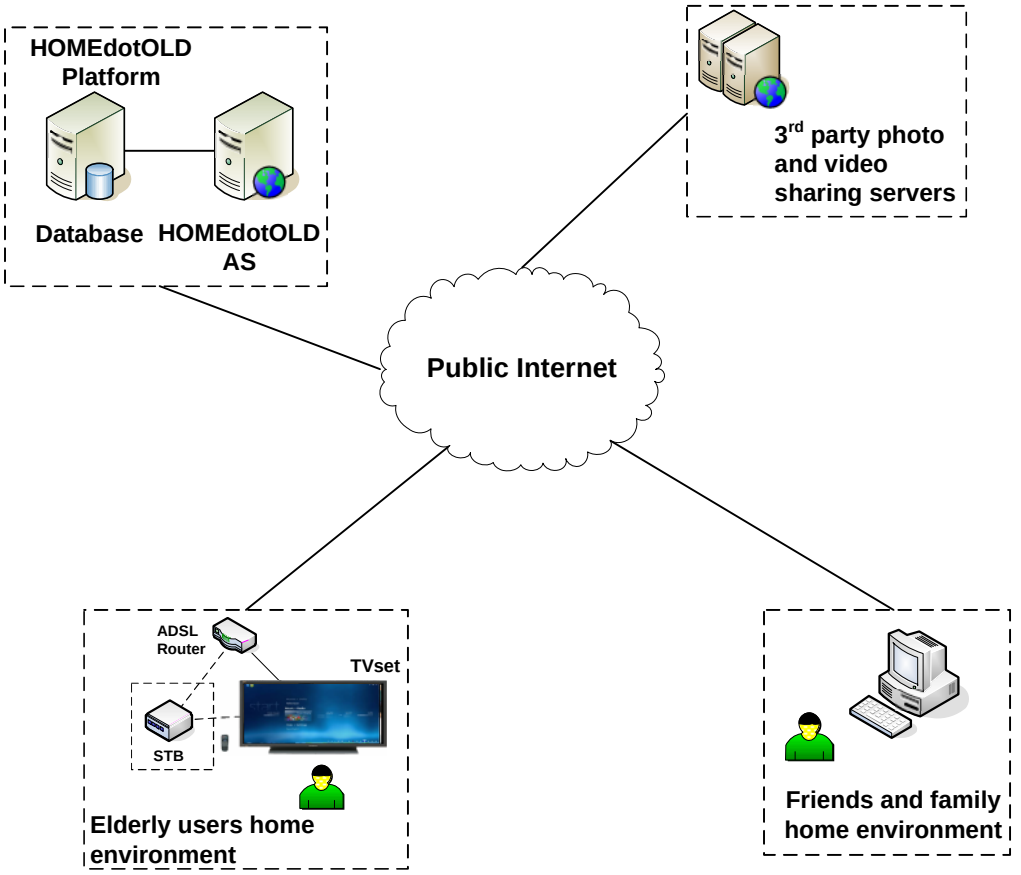

Figure 11: "Photos, Videos and Experience Sharing" service network architecture

The following sections provide in detail the required service configuration and the service operation.

3.2.3.1.1 SERVICE CONFIGURATION

System Administrator / Service provider

The system administrator belongs to the service provider, which commercially exploits the HOMEdotOLD platform and its services. and registers the elderly to a 3rd party photo and video sharing service using his/hers profile information.

The system administrator registers the elderly person profile to the Application Server, which includes the following information:

- ID
- Name and Surname
- Age
- Postal Address
- 3rd party photo and video sharing service username and password
- Contacts (elderly friends and family or other elderly users)

The system administrator provides the elderly with a Personal Identification Number (PIN) for service access through the Philips internet-enabled TV or STB/TVset (AonTV).

3.2.3.1.2 SERVICE OPERATION

Elderly / Sharing of photos

The elderly user uses the Picasa web-interface to create new albums and upload photos and videos using the respective HMIs granting to their network access to the shared albums and photos.

Friends and Family / Sharing of photos

The elderly "network" user (i.e. elderly relative/friend) use the Picasa web-interface to create new albums and upload photos and videos using the respective HMIs granting to their elders access to the shared photos.

Elderly / Accessing the photos and videos

The elderly user logins to the HOMEdotOLD platform. If their relatives and friends have uploaded new photos or videos a notification is shown, informing them about new photos or videos being shared by their "network". The elderly user navigates to the "Photos, videos and experience sharing" service using the remote control by selecting the "Photo, Video Sharing" button from the platform main menu and then the "PhotoAlbums" or "Videos" buttons to access the "Photo Sharing" or the "Video Sharing" service from the service main menu.

Based on the particular elderly user "network" list, he/she are presented with a list of albums / photos or videos that their contacts have shared with them. If the elderly has selected to view photos, a list of albums and photos is presented to him/her. Navigation through the albums and photos is possible through the remote control. If the elderly has selected to view videos, a list of videos is presented to him/her. Navigation and playback of the videos is possible through the remote control.

Friends and Family / Accessing the photos and videos

The elderly "network" users login to the Picasa web-interface and they navigate through shared photos and videos of the elderly user that are associated with.

Accessing 3rd party photo and video sharing sites by the Application Server

The Application Server is able to communicate with 3rd party photo and video sharing web applications in order to upload and present to the elderly shared photos and videos.

Service workflow

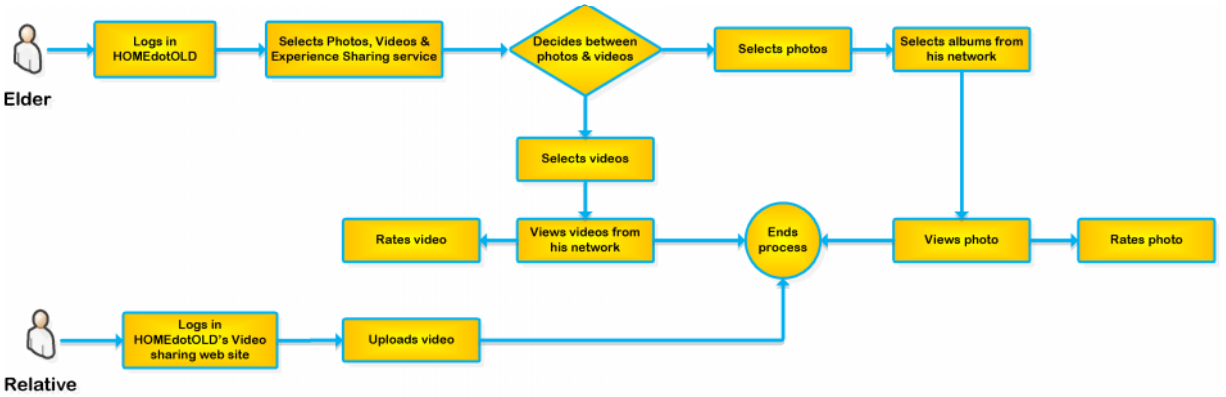

Figure 12: Photos, Videos & Experience Sharing Service workflow

3.2.3.2 FUNCTIONAL SPECIFICATIONS OF THE SERVICE

The following table provides an analytical description of the functional specification of the "Photos, Videos and Experience Sharing" service from the administrator perspective.

"Photos, Videos and Experience Sharing"	
Code	**Functional Specification Description (further details can be found in D42, section 5)**
PVES-A1	The administrator logins to the HOMEdotOLD system through standard PC.
PVES-A2	The administrator selects whether he/she wants to add/edit customers.
PVES-A3	The administrator creates/edits new/existing customer.

Table 28: "Photos, Videos and Experience Sharing" service administrator functional specification

The following table provides an analytical description of the functional specification of the "Photos, Videos and Experience Sharing" service from the elderly user perspective.

"Photos, Videos and Experience Sharing"	
Code	**Functional Specification Description**
PVES-E1	The elderly person logins to the HOMEdotOLD system through a Philips NetTV or a TVset, set-top box and a normal remote control.
PVES-E2	Upon successful authentication elderly person is presented with the HOMEdotOLD services main page.
PVES-E3	The elderly person chooses to access the "Photos, Videos and Experience Sharing" service by selecting the "Photo, Video Sharing" button of the service HMI and pressing the "OK" button on the remote control. The "Photos, Videos and Experience Sharing" service page is presented on the user's screen.
PVES-E4	The elderly person is allowed to choose which service (photo or video) she/he wishes to access by selecting the appropriate options of the service HMI and pressing the "OK" button on the remote control.
PVES-E5	The "Photo Sharing" service page allows the elderly person to view a list of albums and photos that the elderly person "network" is sharing with.
PVES-E6	The elderly person can navigate and view photos using the remote control.
PVES-E7	For each photo presented through the "Photo Sharing" service page the elderly person is prompted to leave an optional response.
PVES-E8	The "Video Sharing" service page allows the elderly person to view a list of videos that the elderly "network" is sharing with.
PVES-E9	The elderly person can navigate and play videos using the remote control.
PVES-E10	For each video viewed through the "Video Sharing" service page the elderly person is prompted to leave an optional response.
PVES-E11	Optional responses include a series of emoticons and earcons.

Table 29: "Photos, Videos and Experience Sharing" service user functional specification

The following table provides an analytical description of the functional specification of the "Photos, Videos and Experience Sharing" service from the elderly "network" perspective.

"Photos, Videos and Experience Sharing"	
Code	**Functional Specification Description**
PVES-N1	The elderly person friend/family login to the HOMEdotOLD system through a standard PC.
PVES-N2	Upon successful authentication the elderly person friend/family is presented with the HOMEdotOLD service main page.
PVES-N3	The "Photo Sharing" service page presents a list of albums and folders that the elderly "network" is sharing.
PVES-N4	The "Video Sharing" service page presents a list of videos that the elderly "network" is sharing.

Table 30: "Photos, Videos and Experience Sharing" service elderly "network" functional specification

3.2.3.3 TECHNICAL SPECIFICATIONS OF THE SERVICE

In this section the HOMEdotOLD "Photos, Videos and Experience Sharing" service architecture is presented, showing the different sub-systems and their position within the application server.

The following table provides an analytical description of the technical specification of the "Photos, Videos and Experience sharing" service.

"Photos, Videos and Experience Sharing"	
Code	**Technical Specification Description**
PVES-TS-1	The **User HMI** groups all HMIs needed by the elderly users in order to access and configure the service. The module is Web4CE compliant.
PVES-TS-2	The **User Administration HMI** groups all HMIs needed in order to manage the HOMEdotOLD users. The module is based on JSP technology.
PVES-TS-3	The *DatabaseClient* **Module** utilises the Hibernate framework providing the interface to the *Users* database and their tables/columns. The module is based on Java technology.
PVES-TS-4	The **Authentication** *Client* is responsible to authenticate the the user based on the user unique ID and PIN and then based on the user unique ID retrieve list of subscribed services. The module is based on Java technology.
PVES-TS-5	The **Picasa** *Client* is responsible to authenticate the elderly users and their network to the Picasa web-server using their unique Google account credentials (username and password). It is also responsible to extract information regarding shared albums and photos.. The module is based on Java technology and the Google Picasa API (*gdata* library) for accessing Picasa web albums.
PVES-TS-6	The **Photos, Videos, Experience Sharing Application Logic** is responsible for communicating with the Picasa client and inform the users when new photos are uploaded. The system presents to the user photo's using a search algorithm from the Picasa photo sharing website, examining the sharing/viewing attributes of the Picasa folder where the

	photo has been uploaded. The module is based on Java technology.
PVES-TS-7	Security protocol to protect user data over the Internet is based on HTTPS, SSL

Table 31: "Photos, Videos and Experience Sharing" service technical specification

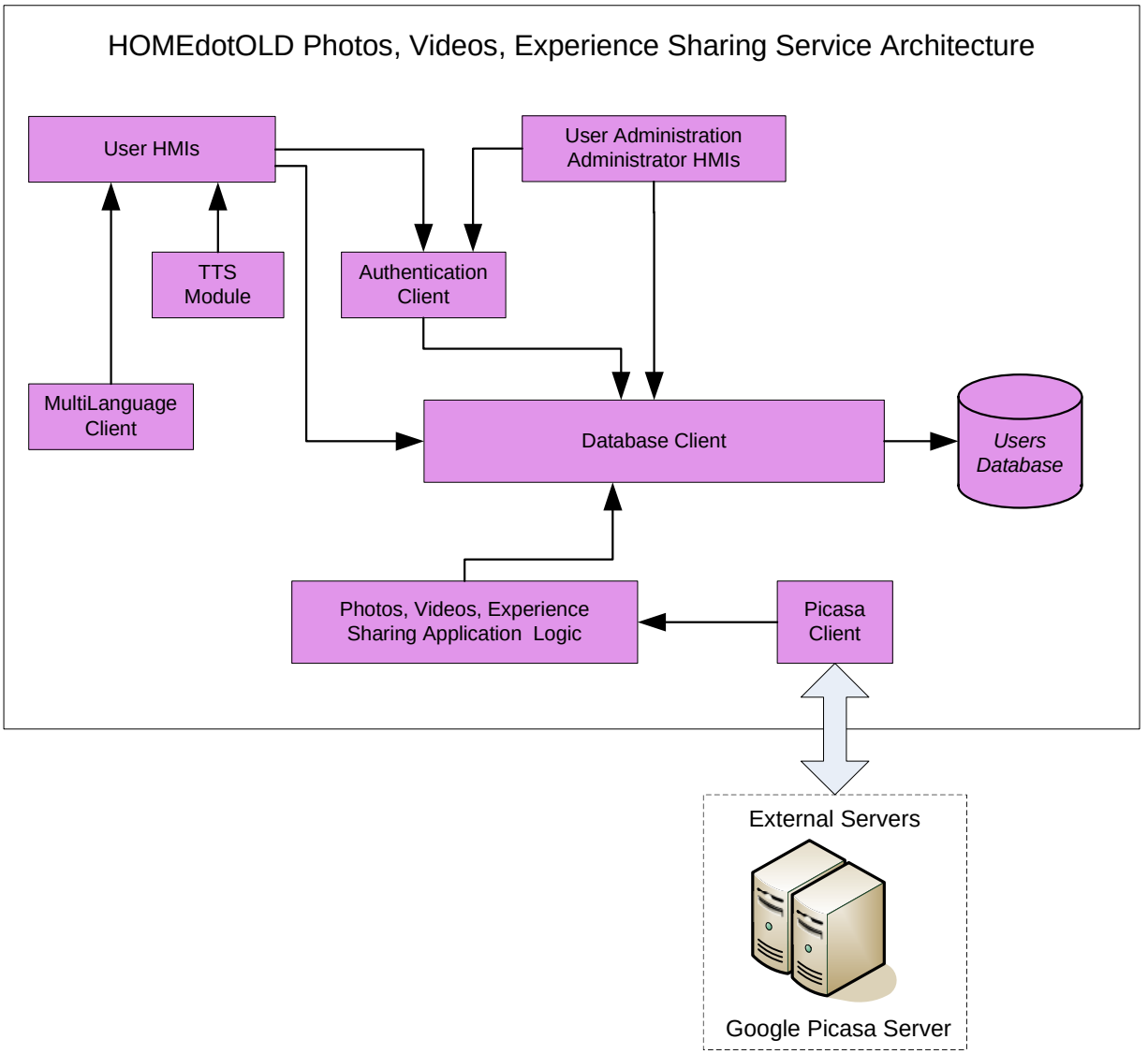

Figure 13: "Photos, Videos and Experience Sharing" service architecture

3.2.3.4 MULTIMODAL INTERFACES SPECIFICATIONS OF THE SERVICE

The following table provides an analytical description of the functional specifications of the multimodal interfaces of the "Photos, Videos and Experience sharing" service.

"Photos, Videos and Experience Sharing"	
Code	**Functional Specification Description**
PVES-MIFS-1	The System Administration HMI allows for elderly users management.
PVES-MIFS-2	The elderly user HMI allows for service selection. "Photos" and "Videos" buttons lead to the "Photo Sharing" service and "Video Sharing" service pages respectively.

PVES-MIFS-3	The elderly user HMI allows navigation through shared Picasa albums and photos and viewing of photos.
PVES-MIFS-4	Notification messages, in the form of pop-up windows, inform the elderly person about new shared content from their network.
PVES-MIFS-5	Text-To-Speech functionality allows elderly person with visual or auditory impairments to use TV-set audio capabilities for listening to notification messages.
PVES-MIFS-6	Remote control or equivalent input device(s) is used for service access and navigation.
PVES-MIFS-7	TV-set audio capabilities are used for communication services.

Table 32: "Photos, Videos and Experience Sharing" service multimodal interfaces functional specification

The following table provides an analytical description of the technical specifications of the multimodal interfaces of the "Photos, Videos and Experience sharing" service.

"Photos, Videos and Experience Sharing"	
Code	**Technical Specification Description**
PVES-MITS-1	The user HMIs are implemented according to HTTP standards and in particular the Web4CE.
PVES-MITS-2	The elderly network user HMIs and the administrator HMIs are based on JSP technology.
PVES-MITS-3	As long as the elderly user is logged in the HOMEdotOLD platform, accessing of services does not require repetitive password input.
PVES-MITS-4	The service supports elderly user anonymity. User data in the database are related to a random user ID and not his/her real details.
PVES-MITS-5	User data in the database is protected from unauthorized use. The interfaces to external systems (the web services) never include user identification data (such as their full names), just their IDs. They are only known to a Service Provider where a user/customer/account is created and are only handled by the administrator who creates the user account.
PVES-MITS-6	The service multimodal interface must support TTS functionality.

Table 33: "Photos, Videos and Experience Sharing" service multimodal interfaces technical specification

3.2.3.5 SPECIFICATIONS OF INTERFACES OF THE SERVICE WITH EXTERNAL SERVICES

The following table provides an analytical description of the functional specifications of the interfaces of the "Photos, Videos and Experience sharing" service, with external services.

"Photos, Videos and Experience Sharing"	
Code	**Functional Specification Description**
PVES-IESFS-1	The interface is responsible for handling requests and the relevant responses from the "Photos, Videos, Experience Sharing Application Logic" module related to: a. Multiple-user Picasa web application authentication

	b. Extraction of list of Picasa albums c. Extraction of list of photos for a specific album d. Extraction of list of photos recently updated for a specific album e.

Table 34: "Photos, Videos and Experience Sharing" service interfaces with external services functional specification

The following table provides an analytical description of the technical specifications of the interfaces of the "Photos, Videos and Experience sharing" service, with external services.

"Photos, Videos and Experience Sharing"	
Code	**Technical Specification Description**
PVES-IESTS-1	Service is using Picasa API and client libraries (http://code.google.com/apis/picasaweb/code.html)

Table 35: "Photos, Videos and Experience Sharing" service interfaces with external services technical specification

4. HOMEDOTOLD ARCHITECTURE

This section provides the description of the HOMEdotOLD architecture, describing the functional and technical specifications of all its modules.

4.1 HOMEDOTOLD ARCHITECTURE OVERVIEW

The HOMEdotOLD Platform Software described in this document consists of a number of different components/modules. Specifically, it consists of the following top-level components, as shown in the following figure:

- the Users Database
- the Database Client
- the Active Modality Module
- the Authentication Module
- the Policy management Module
- the Picasa Client
- the Skype Module (incl a control and notification module)
- the RSS Feeds Client
- the HOMEdotOLD Services Application Logic
- the User HMIs and
- the System Administration HMIs

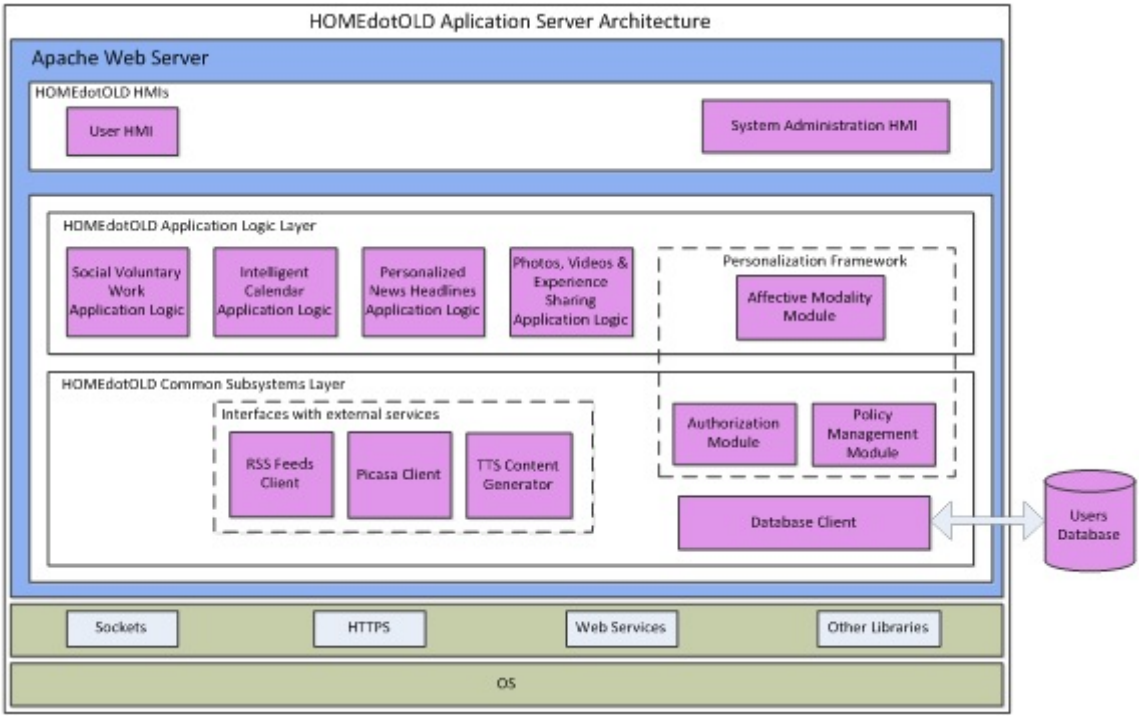

Figure 14: HOMEdotOLD Platform Software – HOMEdotOLD Application Server Architecture

The *Users Database* is used to store user specific data, such as service specific configuration parameters, personalisation information for all services, users' reported emotion is located on the machine hosting the application logic and the user and administrator HMIs. It is also used by the service provider administrator in order to handle service specific parameters, such as the RSS sites list required by the Personalised News Headlines service and the areas of social voluntary work for supporting the Social Voluntary Work service. In order to address security and privacy

issues user profile information (name, surname, address, telephone) is held in a separate database, namely *Customers Database*. Management of the database is achieved through a dedicated application, namely *Customers Administration*. The high level architecture of this application is described in section 4.11.

The *Database Client* utilises the Hibernate framework providing the interface to the *Users* database and their tables/columns.

The *RSS Feeds Client* is responsible for communicating with the news headlines RSS feed web-sites.

The *Picasa Client* is responsible for communicating with the Google Picasa photo sharing server, authenticating the users to the Picasa servers and retrieving a list of shared folders and photos for a specific elderly user.

The *Skype Module* is responsible for connecting to the Skype network, for a specific elderly user via his/her unique Skype account and extracting information regarding his contacts. This includes a control module and a notification module.

The *Authentication Module* is responsible for authenticating the user via a personal logon code.

The *Policy Management Module* is responsible to analyze current dynamic user profile information suggesting appropriate services among those a user is subscribed to. It is also responsible to activate/de-activate services a user is subscribed to, based on frequency of use, mood, interests, and contextual usage information.

The *Affective Modality Module*, which is the main module of the "Personalization Framework", is responsible for retrieving user's self-reported emotions in response to content and mood.

In this architecture there is an application logic layer that hosts the logic needed by the supported services. These are:

- "Social Voluntary Work Application Logic", which is responsible for presenting to the HOMEdotOLD user a list of ongoing social voluntary activities and handling user requests to participate to a forthcoming event.
- "Intelligent Calendar Application Logic", which is responsible for analyzing the calendar data for all users, according to the data entered both by them and by relatives or friends to the system and send notifications to the users if an activity is triggered. It is also responsible for automatically matching preferences of users and suggesting possible common activities between relatives or friends.
- "Personalised News Headlines Application Logic", which is responsible for presenting to the HOMEdotOLD user a list of news headlines, based on the user preferences entered to the system.
- "Photo, Video and Experience Sharing Application Logic", which is responsible for communicating with the Picasa module and inform the users when new photos are uploaded. The system presents to the user photo's using a search algorithm from the Picasa photo sharing website, examining the sharing/viewing attributes of the Picasa album where the photo has been uploaded. Attributes such as who is allowed to view specific contents is used to present to the users a list of albums, photos and videos

respectively.

- "Videoconference and Remote Dining Application Logic" is responsible for presenting to the elderly users a list of contacts that are capable of video calling. It is also responsible for checking whether there are un-answered calls and any pending requests from other platform users to be added to the elderly network.

The *System Administration HMIs* groups all HMIs needed in order to manage the HOMEdotOLD users, the RSS site list and the areas of social voluntary work.

The *User HMIs* groups all HMIs needed by the elderly users in order to access and configure the HOMEdotOLD services that are accessed via the NetTV or AonTV platform.

The Application Server architecture is based the Apache web server, an open source http server executed both on Linux and Windows. The databases use the MySQL Community Server since it is generally available (no license required) and has all the necessary features/procedures needed by our application, plus the Java Database Driver Connector (JDBC Driver - Connector/J) that enables developers to build database applications in Java.

The HMIs for TV-based applications are based on the Web4CE framework, while the administrator and the friends and family HMIs are based on JSP technology. The videoconferencing HMI is a native PC C# application.

4.2 HOMEDOTOLD DATABASE CLIENT

4.2.1 TECHNICAL SPECIFICATIONS

"HOMEdotOLDUsersDatabaseHibernateLibrary Module"	
Code	**Technical Specification Description**
HUDHL-TS-1	The module is based on Java technology.
HUDHL-TS-2	The module uses the Hibernate framework as the persistence layer for retrieving and storing plain old Java objects (POJOs) to a relational database.

Table 36: HOMEdotOLDUsersDatabaseHibernateLibrary Module Technical Specifications

4.2.2 FUNCTIONAL SPECIFICATIONS

"HOMEdotOLDUsersDatabaseHibernateLibrary Module"	
Code	**Functional Specification Description**
HUDKL-FS-1	Communication of the various modules and the *Users* database is done through this module.
HUDKL-FS-2	The module through its Java implemented functionality gives access to the *Users Database* tables and columns

Table 37: HOMEdotOLDUsersDatabaseHibernateLibrary Module Functional Specifications

4.3 AONTV MODULE SPECIFICATION

A more detailed specification of the module interfaces and functionalities shall be provided as soon as the services to be deployed on the aonTV platform are defined.

4.3.1 TECHNICAL SPECIFICATIONS

"aonTV Module"	
Code	**Technical Specification Description**
AONM-TS-1	The module provides the services via SOAP based web service
AONM-TS-2	RSS feeds are presented via a html dialect
AONM-TS-3	image presentation formats in JPEG, PNG and GIF
AONM-TS-4	Video presentation in H.264/MPEG2/4
AONM-TS-5	Data ingestion via server side logic
AONM-TS-6	Notification possible via LED in standby or ON state
AONM-TS-7	IP-based camera for video communication (not videocof!) to be discussed
AONM-TS-8	Software implementation not open, interfaces have to defined for service implementation (server-side)

Table 38: HOMEdotOLD AonTV Module Functional Specifications

4.3.2 FUNCTIONAL SPECIFICATIONS

"aonTV Module"	
Code	**Functional Specification Description**
AONM-FS-1	IPTV platform for connection with any TV set via HDMI or SCART interface
AONM-FS-2	Photos, videos, RSS-feeds and notification for HOMEdotOLD

Table 39: HOMEdotOLD AonTV Module Functional Specifications

4.4 HOMEDOTOLD MULTIMODAL INTERFACES

The user interfaces that are used in HOMEdotOLD include TV-based HMIs, the IE-TVset remote control, a pointer device that can be used instead the remote control and TTS capabilities.

Although the INHOME platform included Speech Recognition (SR) capabilities, we have decided not to integrate this functionality or any other speech input modality in the HOMEdotOLD platform and services for the reasons that are presented in the following paragraphs.

The INHOME project provided an experimental research prototype of WebTV services infrastructure. During the initial setup the HOMEdotOLD concept, the INHOME prototype was available, consisting of a user terminal (Sony PC-like terminal with Windows Media Center) and an external Application Server hosting specialized elderly TV-based services. The user terminal provided full TTS and SR functionality, nevertheless with the following disadvantages:

- Special installation of microphone arrays was required within the home environment in order to be able to get high quality of experience for the end user. This constitutes an expensive solution requiring complex installation and calibration.

- Based on our experience from the INHOME trials, SR functionality was not preferred by the elderly users, since it introduced many difficulties in the usage of the services. This was also valid from an experienced user point of view due to the low maturity of the TTS/SR engines.

Nowadays, STBs used in commercial IPTV platforms and Internet-enabled TVs constitute the main driver for the potential commercialization of TV-based services. This is why AonTV and NetTV are selected to be used in the project for the deployment of the HOMEdotOLD services. Nevertheless, such terminals do not provide TTS and SR capabilities due to their limited processing power and computation resources.

Furthermore, speech recognition was not a requirement of the HOMEdotOLD user groups.

For the aforementioned reasons, the INHOME platform and its speech input modality was decided not to be used in HOMEdotOLD.

Although the INHOME TTS engine cannot be used in HOMEdotOLD due to the limited processing power and computation resources of the terminals, an Internet-based external TTS solution is used, which is integrated on the server side of the HOMEdotOLD platform (on the Application Server). Thus, basic TTS functionality is supported for the HOMEdotOLD services.

4.5 INTERFACES WITH EXTERNAL SERVICES SPECIFICATION

4.5.1 RSS FEEDS CLIENT SPECIFICATION

The RSS Feeds module is responsible for connecting and extracting required information to/from sites that support RSS technology.

4.5.1.1 TECHNICAL SPECIFICATIONS

"RSS Feeds Module"	
Code	**Technical Specification Description**
RSSFM-TS-1	The module is using standard RSS Utilities package (http://java.sun.com/developer/technicalArticles/javaserverpages/rss_utilities/) for communicating with RSS feed sites.
RSSFM-TS-2	The module is based on Java technology.
RSSFM-TS-3	The interface with other modules is provided in Table 41

Table 40: RSS Feeds Module Technical Specifications

4.5.1.1.1 RSS FEEDS MODULE INTERFACE

The interface is responsible for handling requests and the relevant responses from the "Personalised News Headlines Application Logic" module related to:

a. Connection to specific RSS site, through specific URL
b. Extraction of RSS specific information, such as *itemTitle* and *itemDescription*

Return Value	**Interface/Function Name**	**Input Parameters**	
FeedID	*ConnectToRSS*	**String**	URL
String	*GetChannelItems*	**String**	FeedID

Table 41: System Administration Module Interface

The ***ConnectToRSS*** function establishes a TCP/IP connection to the specified URL, given by the *URL* parameter.

The ***GetChannelItems*** for an established connection returns the item title and description.

4.5.1.2 FUNCTIONAL SPECIFICATIONS

"RSS Feeds Module"	
Code	**Functional Specification Description**
RSSFM-FS-1	The module is responsible for handling requests and the relevant responses from the "Personalised News Headlines Application Logic" module related to: a. Connection to specific RSS site, through specific URL b. Extraction of RSS specific information, such as *itemTitle* and *itemDescription*

Table 42: RSS Feeds Module Functional Specifications

4.5.2 PICASA CLIENT SPECIFICATION

4.5.2.1 TECHNICAL SPECIFICATIONS

"Picasa Module"	
Code	**Technical Specification Description**
PM-TS-1	The module is using Google Picasa API (*gdata* library) for accessing Picasa web albums.
PM-TS-2	The module is based on Java technology.
PM-TS-3	The interface with other modules is provided in Table 44

Table 43: Picasa Module Technical Specifications

4.5.2.1.1 PICASA MODULE INTERFACE

Return Value	**Interface/Function Name**	**Input Parameters**
void	*initPicasaWebService*	**String username,** **String password**
List<wrapAlbumEntry>	*getAlbumsList*	**String username**
wrapAlbumEntry	*getAlbumEntry*	**String username,** **String id**
List<wrapPhotoEntry>	*getPhotosFromAlbum*	**String username,** **wrapAlbumEntry album**
List<wrapComment>	*getComments*	**String username,** **String albumID,** **String photoID**
List<wrapPhotoEntry>	*getRecentlyUploadedPhotos*	**String username**
boolean	*addComment*	**String username,** **String albumID,**

		String **String**	**photoID,** **comment**

Table 44: Picasa Module Interface

The ***initPicasaWebService*** function sets the credentials of the user to authenticate requests to the Picasa server, according to the *username* and *password* input parameters.

The ***getAlbumsList*** function returns the albums belonging to a particular user, indicated by the *username* input parameter (feed URL). The feed URL value is "https://picasaweb.google.com/data/feed/api/user/" + username + "?kind=album" . Return *wrapAlbumEntry* list contains for each album the number of photos, the album thumbnail, the album name and id, as well as the ownwer username.

The ***getAlbumEntry*** function returns for a specific user given by the *username* input parameter, the selected album entries indicated by the *id* input parameter associated with a particular feed URL. The feed URL value is "https://picasaweb.google.com/data/feed/api/user/" + username + "/albumid/" + id . Return *wrapAlbumEntry* contains the album number of photos, thumbnail, name and id, as well as the ownwer username.

The ***getPhotosFromAlbum*** function returns for a specific user given by the *username* input parameter and a specific album given by the *album* input parameter, the selected album photo entries as thumbnails. The feed URL value is "https://picasaweb.google.com/data/feed/api/user/" + username + "/albumid/" + albumId + "?thumbsize=144c" + preview. Return *wrapPhotoEntry* contains the photo name, URL, thumbnail, description, publishedDate, name of the album that it belongs, associated comments, as well as the ownwer username.

The ***getComments*** function returns for a specific user given by the *username* input parameter, a specific album given by the *album* input parameter and a specific photo given by the *photoID* input parameter, the comments associated with that photo. The feed URL value is "https://picasaweb.google.com/data/feed/api/user/" + username + "/albumid/" + albumId + "/photoid/" + photoID. Return *wrapComment* list contains for the specific photo the comments, their published date as well as who made that comment.

The ***getRecentlyUploadedPhotos*** function returns for a specific user given by the *username* input parameter a list of recently uploaded photos. The feed URL is "https://picasaweb.google.com/data/feed/api/user/" + username + "?kind=photo". Return *wrapPhotoEntry* contains the photo name, URL, thumbnail, description, publishedDate, name of the album that it belongs, associated comments, as well as the ownwer username.

The ***addComment*** function adds for a specific user given by the *username* input parameter, a comment given by the *comment* input parameter to a specific photo identified by the *albumID* and *photoID* input parameters. The feed URL is "https://picasaweb.google.com/data/feed/api/user/" + username + "/albumid/" + albumID + "/photoid/" + photoID. Return Boolean value is true if comment was added and false if comment could not be added.

4.5.2.2 FUNCTIONAL SPECIFICATIONS

"Picasa Module"	
Code	**Functional Specification Description**
PM-FS-1	The Picasa Module is responsible for connecting to the Google Picasa server, for a specific elderly user via his/hers unique Google account

	credentials (username and password).
PM-FS-2	The module is responsible to extract information regarding shared folders and photos for specific users.

Table 45: Picasa Module Functional Specifications

4.5.1 SKYPE MODULE SPECIFICATION

4.5.1.1 TECHNICAL SPECIFICATIONS

"Skype Module"	
Code	**Technical Specification Description**
SM-TS-1	The module is using the Skype4COM (an ActiveX component) in order to establish a connection to Skype client and communicate with it.
SM-TS-2	The module is using the Skype4COM in order to communicate with the Skype client. This is possible using COM interop.
SM-TS-3	Operations are done via Object Oriented mechanism.
SM-TS-4	The module uses Skype protocol 8.
SM-TS-5	The module is based on.Net Framework using C#.

Table 50: Skype Module Technical Specification

"Control Module"	
Code	**Technical Specification Description**
SM-TS-6	The module uses a BlueBox to convert UART commands to CEC commands and vice versa via HDMI
SM-TS-7	The module uses a HDMI-CEC to USB to RS-232 Bridge

Table 51: Control Module Technical Specification

"Notification Module"	
Code	**Technical Specification Description**
SM-TS-8	The module uses jointSPACE to draw a bmp image of a notification on the TV display
SM-TS-9	The module receives incoming call information from the Skype module via XML-RPC

Table 51: Notification Module Functional Specification

4.5.1.2 FUNCTIONAL SPECIFICATIONS

"Skype Module"	
Code	**Functional Specification Description**
SM-FS-1	The module is a wrapper responsible for connecting to the Skype PC application, for a specific elderly via his/hers unique Skype account credentials. (Note: credentials are not being used via Skype4COM, we use information of the currently logged in person)

SM-FS-2	The module is responsible for making and managing (video) calls on the TV. (Note: Also audio calls)
SM-FS-3	The module is responsible for managing missed calls
SM-FS-4	The module is responsible for managing contact requests
SM-FS-5	The module is responsible for displaying contact requests (All these functional specs are managing and displaying. Remove this one)

Table 51: Skype Module Functional Specification

"HDMI-CEC Module"	
Code	**Functional Specification Description**
SM-FS-6	The module is responsible for translating commands send to the TV by remote control or the Skype module

Table 51: Control Module Functional Specification

"Notification Module"	
Code	**Functional Specification Description**
SM-FS-7	The module is responsible for a notification pop-up when there is an incoming call.

Table 51: Notification Module Functional Specification

4.6 PERSONALISATION FRAMEWORK SPECIFICATION

The personalisation framework consists of an Authentication Module which is a login code for users, a Policy Management Module that offers the services information on user reported emotion in response to content and reported mood. The Policy Management Module is implemented as an API to retrieve particular aggregated data. The third component is an Affective Modality module that is the part of the API that allows for collection of mood and emotional response data.

4.6.1 AUTHENTICATION MODULE SPECIFICATION

4.6.1.1 TECHNICAL SPECIFICATIONS

"PF authentication module"	
Code	**Technical Specification Description**
PFAM-TS-N1	Authenticate user using cookies
PFAM-TS-N2	Retrieve subscription of services for User ID from user profile table in database

Table 46: Authentication module technical specifications

4.6.1.2 FUNCTIONAL SPECIFICATIONS

"PF authentication module"	
Code	**Functional Specification Description**
PFAM-FS-N1	Provide user with services he is subscribed to

Table 47: Authentication module functional specifications

4.6.2 POLICY MANAGEMENT MODULE SPECIFICATION

4.6.2.1 TECHNICAL SPECIFICATIONS

"PF Policy management module"	
Code	**Technical Specification Description**
PFPM-TS-N1	Updates user profile with reported emotion and mood data
PFPM-TS-N2	Responds to services' requests for last reported emotion for user/service using the Get_last_emotion function
PFPM-TS-N3	Reports to services request for most and least common emotion between a given begin- and enddate and time, using the Get_most_common_emotion and Get_least_common_emotion function respectively
PFPM-TS-N4	Reports to services' request for last instance a particular emotion was recorded using Get_last_instance function
PFPM-TS-N5	Requests and uses logfiles of services access and preference settings
PFPM-TS-N6	Responds to services' request to provide access frequency of services using the Get_access_frequency function
PFPM-TS-N7	Responds to services' request to provide number of reports of a given emotion for a given begin- and enddate and time, using the Get_emotion_frequency function
PFPM-TS-N8	Responds to services' request to provide last time a user has reported feeling lonely for a given timeframe using the Get_loneliness_frequency function
PFPM-TS-N9	Responds to services' request to provide current loneliness state
PFPM-TS-N10	Responds to services' request to provide all tags of an emotion, for a service, for a user, between two dates
PFPM-TS-N11	Responds to services' request to provide emotion tag awarded to specific content using the Get_emotion_description function

Table 48: Policy management module technical specifications

4.6.2.2 FUNCTIONAL SPECIFICATIONS

"PF Policy management module"	
Code	**Functional Specification Description**
PFPM-FS-N1	Stores users' response to content based on selfreported emotion indicated through selection of tags
PFPM-FS-N2	Stores users' reported mood based on selection of a tag following a mood question
PFPM-FS-N3	Allows services to access stored data via an API

Table 49: Policy management module functional specifications

What the personalization framework does not do:

- Determine content of services
- Force personalisation, user can overwrite suggested personalisation

4.6.3 AFFECTIVE MODALITY MODULE SPECIFICATION

4.6.3.1 TECHNICAL SPECIFICATIONS

"PF affective modality module"	
Code	**Technical Specification Description**
PFAF-TS-N1	Detect users' mood based on a loneliness question
PFAF-TS-N2	Detect users' emotional state when viewing content through interface elements embedded into services

Table 50: Affective modality module technical specifications

4.6.3.2 FUNCTIONAL SPECIFICATIONS

"PF affective modality module"	
Code	**Functional Specification Description**
PFAF-FS-N1	Assess Users' mood
PFAF-FS-N2	Assess users' emotional response to content
PFAF-FS-N3	Provide assessment to policy management module via storage in user profile table

Table 51: Affective modality module functional specifications

4.7 SOCIAL VOLUNTARY WORK APPLICATION LOGIC SPECIFICATION

The application logic of the social voluntary work service incorporates the systemic modules that are depicted in the following figure

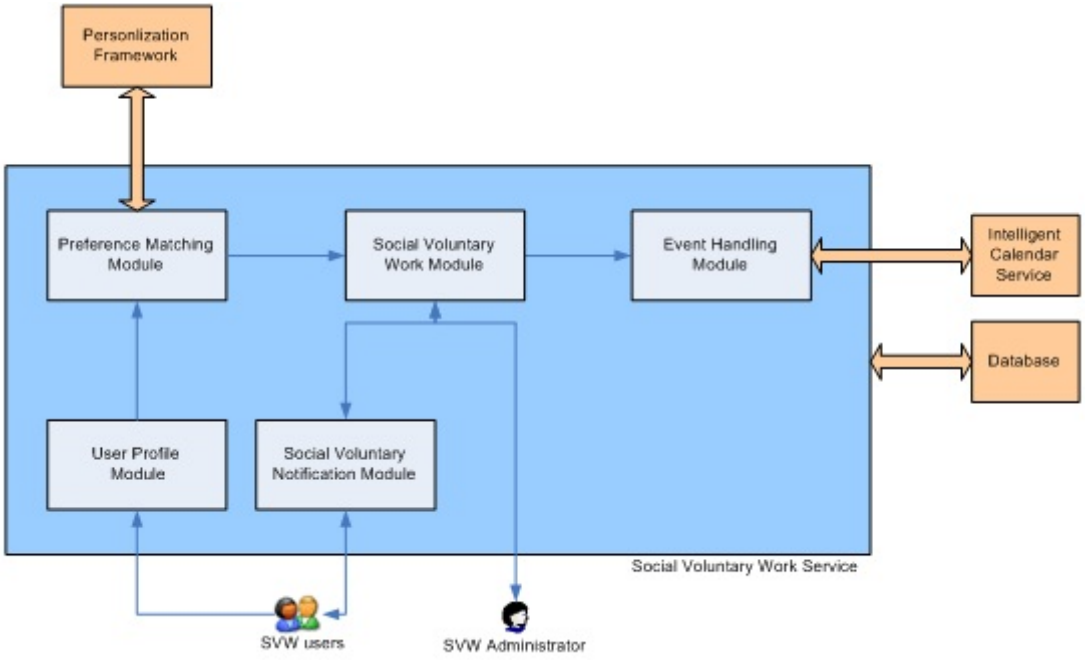

Figure 15: Social Voluntary Work service Application Logic

The following table provides an analysis of each of the systemic components / modules that comprise the holistic social voluntary work service application logic:

Social Voluntary Work service Application Logic	
Systemic Module	**Systemic Module Description**
Session Handling Module	The Session Handling module is responsible for the management of all active session user profile related information. It is in a sense complementary to the User Profile module.
User Profile Module	The User Profile Module is responsible for the management of the user information and related personal data. This module also manages the user preferences (categories of interest) in order to implement the personalization techniques required by the service, i.e. the proposition of specific activities, based upon the user preferences.
Preference Matching Module	The Preference Matching module is responsible for the recognition of social voluntary work activities according to the user preferences. This module interacts with the User Profile Module in order to filter events which may interest the user based on the available categories.
Social Voluntary Work Notification Module	The Social Voluntary Work Notification Module is responsible for the management of social voluntary work information and for the display of the event notifications in a user friendly format. It is responsible for informing the user about new or pending Social Voluntary Work events.
Social Voluntary Work Module	The Social Voluntary Work Module is responsible for the management of Social Voluntary Work events (i.e. creation, editing, deleting) by the system administrator. This module interacts with Preference Matching Module in order to acquire events which may interest the user, and with the Social Voluntary Work Notification Module which it feeds with information regarding new or pending events.
Event Handling Module	The Event Handling Module is responsible for the extraction of information regarding a new social voluntary work activity event. It interacts with the Social Voluntary Work Module, and based on the voluntary work activity event information it initializes a new Event. It is also responsible for the event creation and status.
Notification Module	The Notification Module is responsible for the management and extraction of information that refer to a user. It interacts with the Event Handling Module from which it retrieves information, and with the Social Voluntary Work Notification Module to which it feeds this information, for the latter to display it to the end user. The Notification Module produces a set of notifications based on the Event type and Event status.

Table 52: "Social Voluntary Work service Application Logic

4.7.1 TECHNICAL SPECIFICATIONS

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW-AL-TS-01	Security	The application logic should incorporate personal data protection mechanisms. This should include telecommunication

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
		security (transport layer) (i.e. HTTPS, SSL) and RDBMS encryption (data layer) mechanisms.
SVW-AL-TS-02	Performance	The application should be 99,9% reliable and support low utilisation of the Application Server resources
SVW-AL-TS-03	Database homogenisation	A normalised entity relationship model (RDBMS) must be developed that will support transparent to the user communication between: a) a user and his network, b) a user and his notifications, c) a user and his interests and d) services
SVW-AL-TS-04	Role management	The RDBMS must be user-based and support role management that will allow for services configuration.
SVW-AL-TS-05	Asynchronous communication	The application must support asynchronous communication for the exchange of notifications and responses amongst the users. Synchronous communication is not required.
SVW-AL-TS-06	Text input	System must support keyboard editing widgets/libraries
SVW-AL-TS-07	Voice Support	The multimodal interface of the application must support TTS functionalities.
SVW-AL-TS-08	Development Standard	The User HMI should be Web4CE compliant. The Administrator HMI should be based on standard jsp/html technology
SVW-AL-TS-09	Mail support	The application should utilise a mail client for the automatic delivery of an auto-generated message to a pre-selected list of recipients
SVW-AL-TS-10	External communication	The Social Voluntary Work service must support communication with internal services, i.e. the Intelligent Calendar service, notifying about upcoming events or activities that a user may be interested in.

Table 53: "Social Voluntary Work service Application Logic Technical Specifications

4.7.2 FUNCTIONAL SPECIFICATIONS

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
SVW-AL-FS-01	Session management	The SVW application logic must be able to handle active session user profile related information. The SVW Session Handling Module is responsible for this information management.
SVW-AL-FS-02	User Information management	The SVW application logic must be able to handle user information and related personal data, and manage user preferences. The SVW User Profile Module is responsible for

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
		the information management.
SVW-AL-FS-03	Preference matching	The SVW application logic must be able to support the identification of social voluntary work activities according to the user preferences and from the input from the Personalisation Framework. The SVW Preference Matching Module is responsible for the filtering of the events.
SVW-AL-FS-04	Event management	The SVW application logic must be able to support the management of Social Voluntary Work events (i.e. creation, editing, deleting). The Social Voluntary Work Module is responsible for the SVW event management.
SVW-AL-FS-05	Notification production	The SVW application logic must be able to support the production of notifications regarding social voluntary work activities. The Notification Module is responsible for the management and extraction of information that refer to a user
SVW-AL-FS-06	Notification display	The SVW application logic must be able to display notifications regarding new or pending Social Voluntary Work events. The Social Voluntary Work Notification Module is responsible for the display of social voluntary work event notifications in a user friendly format
SVW-AL-FS-07	Interaction with the Personalisation Framework	The SVW application logic must be able to support interaction with the Personalisation Framework. The User Profile Module retrieves input from the Personalisation Framework regarding the user mood, and if the user feels lonely the Preference Matching Module retrieves additional activities, either from the user network, or from the generic categories, in order to enhance the individual's agenda.

Table 54: "Social Voluntary Work service Application Logic Functional Specifications

4.8 INTELLIGENT CALENDAR APPLICATION LOGIC SPECIFICATION

The application logic of the intelligent calendar service incorporates the systemic modules that are depicted in the following figure

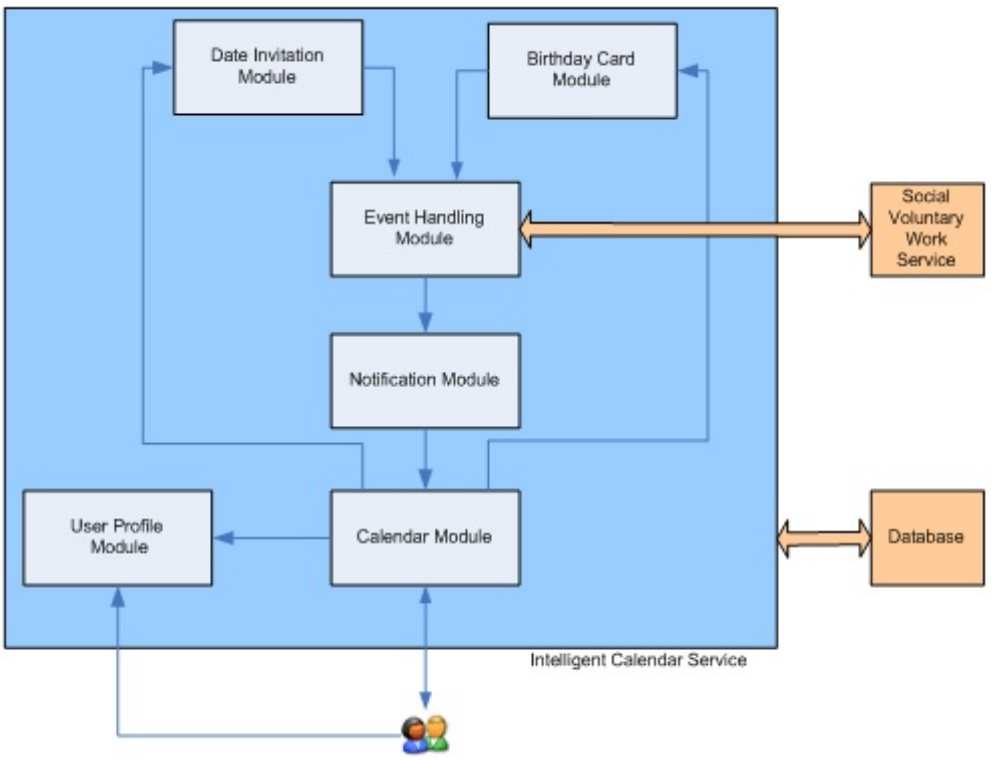

Figure 16: Intelligent Calendar service Application Logic

The following table provides an analysis of each of the systemic components / modules that comprise the holistic intelligent calendar service application logic:

Intelligent Calendar service Application Logic	
Systemic Module	**Systemic Module Description**
Session Handling Module	The Session Handling module is responsible for the management of all active session user profile related information. It is in a sense complementary to the User Profile module.
User Profile Module	The User Profile Module is responsible for the management of the user information and related personal data. This module also manages the user preferences (categories of interest) in order to implement the personalization techniques required by the service, e.g. the proposition of specific activities, based upon the user preferences.
Calendar Module	The Calendar Module is responsible for the management of calendar information and for the display of event notifications in calendar user friendly format. It is responsible for informing the user about his daily agenda, and his new/pending events. It manages invitation sending to other users.
Date Invitation Module	The Date Invitation Module is responsible for the management of date invitations (i.e. creation, editing) and date invitation requests (i.e. confirmation, rejection). This module interacts with the Event Handling Module which it feeds with information regarding new or pending events.
Birthday	Birthday Card Module enables the user to exchange birthday cards with

Card Module	contacts belonging to his network
Event Handling Module	The Event Handling Module is responsible for the extraction of information regarding new date events. It interacts with the Date Invitation Module, extracts information concerning a new date event, and based on the date event information it initializes a new Event. It is also responsible for the event creation and status.
Notification Module	The Notification Module is responsible for the management and extraction of information that refer to a user. It interacts with the Event Handling Module from which it retrieves information, and with the Calendar Module to which it feeds this information, for the latter to display it to the end user. The Notification Module produces a set of notifications based on the Event type and Event status.

Table 55: "Intelligent Calendar service Application Logic

4.8.1 TECHNICAL SPECIFICATIONS

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
IC-AL-TS-01	Security	The application logic should incorporate personal data protection mechanisms. This should include telecommunication security (transport layer) (i.e. HTTPS, SSL) and RDBMS encryption (data layer) mechanisms.
IC-AL-TS-02	Performance	The application should be 99,9% reliable and support low utilisation of the Application Server resources
IC-AL-TS-03	Database homogenisation	A normalised entity relationship model (RDBMS) must be developed that will support transparent to the user communication between: a) a user and his network, b) a user and his notifications, c) a user and his interests and d) services
IC-AL-TS-04	Role management	The RDBMS must be user-based and support role management that will allow for services configuration.
IC-AL-TS-05	Asynchronous communication	The application must support asynchronous communication for the exchange of notifications and responses amongst the users. Synchronous communication is not required.
IC-AL-TS-06	Text input	System must support keyboard editing widgets/libraries
IC-AL-TS-07	Voice Support	The multimodal interface of the application must support TTS functionalities.
IC-AL-TS-08	Development Standard	The User HMI should be Web4CE compliant.
IC-AL-TS-09	Mail support	The application should utilise a mail client for the automatic delivery of an auto-generated message to a pre-selected list of recipients
IC-AL-TS-10	External communication	The Social Voluntary Work service must support communication with internal services, i.e. the Intelligent Calendar service,

Intelligent Calendar		
Spec. ID	**Specification Label**	**Specification Description**
		notifying about upcoming events or activities that a user may be interested in.

Table 56: "Intelligent Calendar service Application Logic Technical Specifications

4.8.2 FUNCTIONAL SPECIFICATIONS

Social Voluntary Work		
Spec. ID	**Specification Label**	**Specification Description**
IC-AL-FS-01	Session management	The IC application logic must be able to handle active session user profile related information. The IC Session Handling Module is responsible for this information management.
IC-AL-FS-02	User Information management	The IC application logic must be able to handle user information and related personal data, and manage user preferences. The IC User Profile Module is responsible for the information management.
IC-AL-FS-03	Preference matching	The IC application logic must be able to support preference matching amongst users belonging to the same network, according to the user preferences and from the input from the Personalisation Framework. The IC User Profile Module is responsible for this preference matching.
IC-AL-FS-04	Event management	The IC application logic must be able to support the management of date invitations (i.e. creation, editing) and date invitation requests (i.e. confirmation, rejection). The Date Invitation Module is responsible for the date event management.
IC-AL-FS-05	Notification production	The IC application logic must be able to support the production of notifications regarding date events. The Notification Module is responsible for the management and extraction of information that refer to a user.
IC-AL-FS-06	Notification display	The IC application logic must be able to display notifications regarding new or pending date events. The Calendar Module is responsible for the display of event notifications in calendar user friendly format.
IC-AL-FS-07	Interaction with the Personalisation Framework	The IC application logic must be able to support interaction with the Personalisation Framework. The User Profile Module retrieves input from the Personalisation Framework regarding the user mood, and if the user feels lonely the Preference Matching Module retrieves additional activities, e.g. social voluntary work activities, either from the user network, or from the generic categories, in order to enhance the individual's agenda.

Table 57: "Intelligent Calendar service Application Logic Functional Specifications

4.9 PERSONALISED NEWS HEADLINES APPLICATION LOGIC SPECIFICATION

The *Personalised News Headlines Application Logic* is responsible for obtaining the sources of information, based on the service configuration parameters that are then passed to the RSS Feeds Module. Positioning of the module with respect to the HOMEdotOLD application server modules is shown in Figure 7.

4.9.1 TECHNICAL SPECIFICATIONS

"Personalised News Headlines Application Logic"	
Code	**Technical Specification Description**
PNH-AL-TS-1	The module is based on Java technology.

Table 58: Personalised News Headlines Application Logic Technical Specifications

4.9.2 FUNCTIONAL SPECIFICATIONS

"Personalised News Headlines Application Logic"	
Code	**Functional Specification Description**
PNH-AL-FS-1	The module queries policy management module in order to check whether service is active for a specific user.
PNH-AL-FS-2	The module extracts user categories of interest from *Users Database.*
PNH-AL-FS-3	For each category of interest module extracts RSS site URL that is then passed to the RSS Feeds module.
PNH-AL-FS-4	Based on the user preferences, the selected news categories and the associated news headlines are presented to the end uer. Futhermore, based on the user mood and the feedback provided by the Personalisation Framework, specific news headlines categories are presented to the user. For instance, if the user mood is not good, news categories related to entertainment are selected to be displayed instead of politics.
PNH-AL-FS-5	The module generates HTML code from the return values of the RSS Feeds module functions that is then passed to the user HMI.

Table 59: Personalised News Headlines Application Logic Functional Specifications

4.10 PHOTOS, VIDEOS, EXPERIENCE SHARING APPLICATION LOGIC

The *Photos, Videos, Experience Sharing Application Logic* is responsible for checking whether new photos and videos are available, based on the elderly network. Moreover it is responsible for checking whether there are pending requests from other platform users to be added to the elderly network. Positioning of the module with respect to the HOMEdotOLD application server modules is shown in the following figure

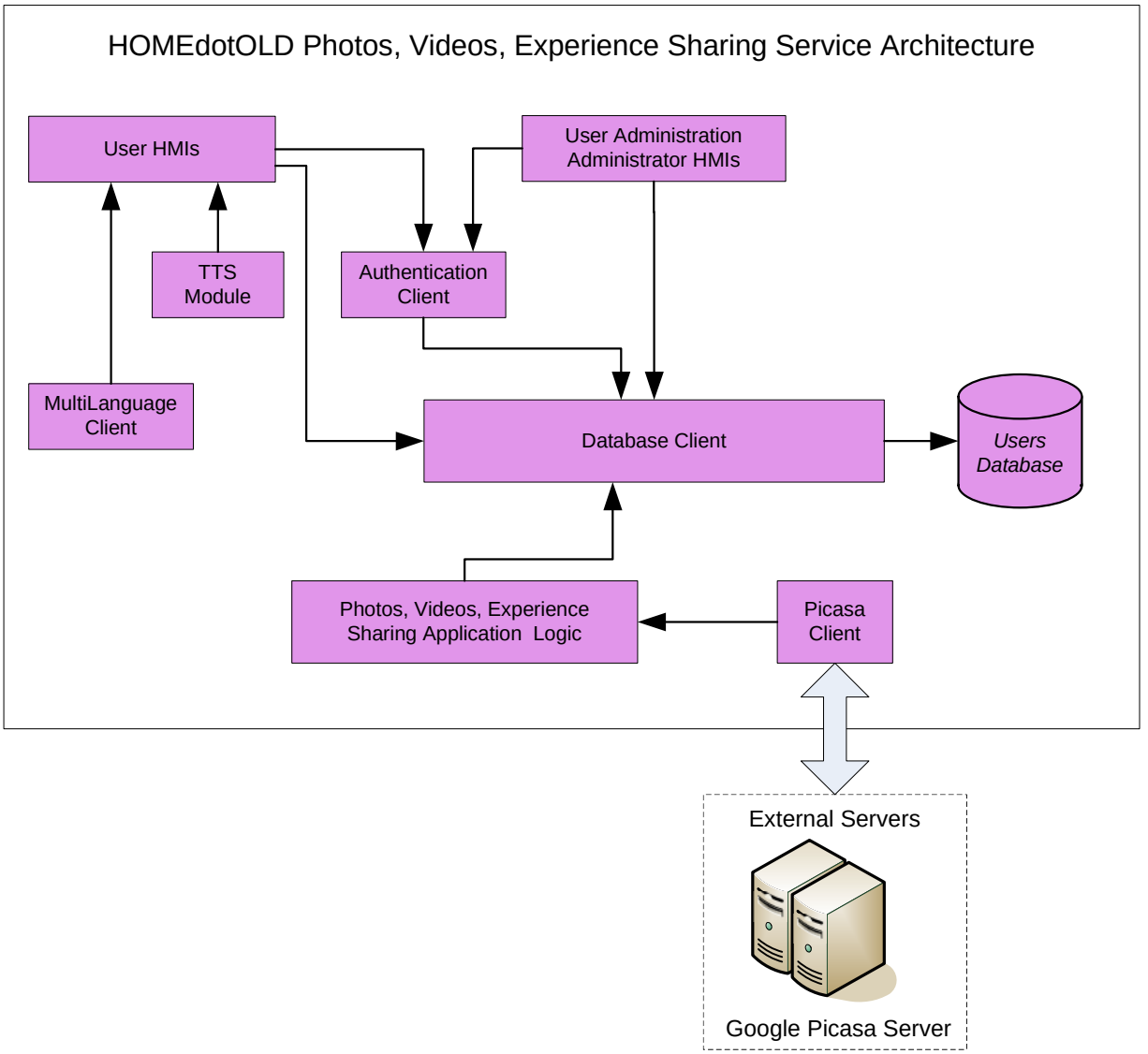

Figure 13.

4.10.1 TECHNICAL SPECIFICATIONS

"Photos, Videos, Experience Sharing Application Logic"	
Code	**Technical Specification Description**
PVES-AL-TS-1	The module is based on Java technology.
PVES-AL-TS-2	The module uses exposed functions of the Picasa module in order to connect to the Google Picasa servers.

Table 60: Photos, Videos, Experience Sharing Application Logic Technical Specifications

4.10.2 FUNCTIONAL SPECIFICATIONS

"Photos, Videos, Experience Sharing Application Logic"	
Code	**Functional Specification Description**

PVES-AL-FS-1	The module queries policy management module in order to check whether service is active for a specific user.
PVES-AL-FS-2	The module is responsible for checking whether new photos and videos are available, based on the elderly network.
PVES-AL-FS-3	The module extracts list of photos, folders and videos that the elderly "network" is sharing with.
PVES-AL-FS-4	For each photo accessed by the elderly the module prompts to leave an optional response.
PVES-AL-FS-5	For each video accessed by the elderly the module prompts to leave an optional response.

Table 61: Photos, Videos, Experience Sharing Application Logic Functional Specifications

4.11 VIDEO CONFERENCING AND REMOTE DINING APPLICATION LOGIC

The *Videoconference and Remote Dining Application Logic* is responsible for checking whether there are un-answered calls and any pending requests from other platform users to be added to the elderly network.

4.11.1 TECHNICAL SPECIFICATIONS

"Videoconference and Remote Dining Application Logic"	
Code	**Technical Specification Description**
VRD-AL-TS-1	The module is based on C# technology.
VRD-AL-TS-2	The module uses Skype4COMfor accessing the Skype network and the installed Skype client.

Table 62: Videoconference and Remote Dining Application Logic Technical Specifications

4.11.2 FUNCTIONAL SPECIFICATIONS

***"Videoconference and Remote Dining* Application Logic"**	
Code	**Functional Specification Description**
VRD-AL-FS-1	The module is responsible for checking whether there are un-answered calls.
VRD-AL-FS-2	The module is responsible for checking whether there are pending requests from other platform users to be added to the elderly network.

Table 63: Videoconference and Remote Dining Application Logic Functional Specifications

4.12 HOMEDOTOLD CUSTOMERS ADMINISTRATION

The HOMEdotOLD customers administration application consists of a number of different components/modules. Specifically, it consists of the following top-level components, as shown in Figure 17:

- the Customers Database
- the NumberGenerator Module

- the Database Client
- the Customer Administration Module
- the Customer Administration HMIs

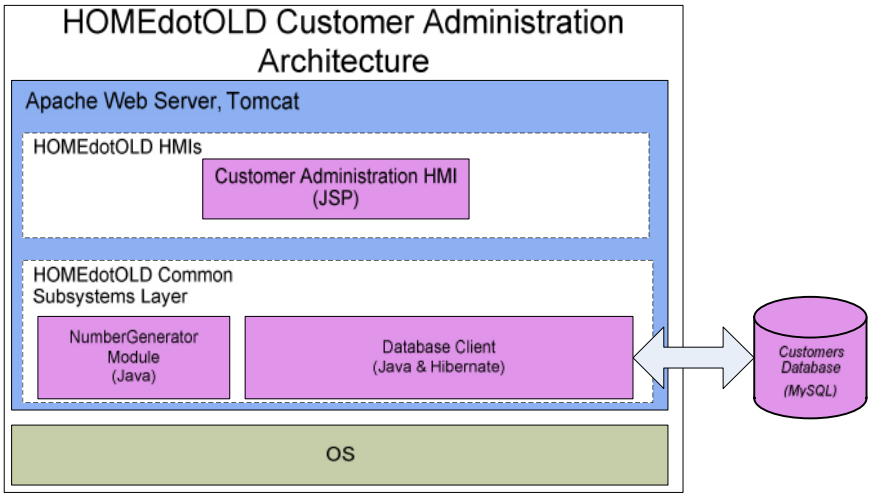

Figure 17: HOMEdotOLD Platform Software – HOMEdotOLD Customers Administration Architecture

The *Customers Database* is used to store customer profile data (name, surname, address, telephone) and is located on a stand-alone server with no network or Internet connectivity, thus reducing the probability of a network attack compromising system's integrity.

The *Database Client* utilises the Hibernate framework providing the interface to the *Customers* database and their tables/columns.

The *NumberGenerator Module* utilises the Java math library for creating a new random number that is then used to uniquely identify a customer in the *Customers Database*. The same number is also used to identify a customer in the *Users Database (Customer_ID)*.

The *Customer Administration HMIs* groups all HMIs needed in order to manage the HOMEdotOLD customers.

4.12.1 CUSTOMER ADMINISTRATION MODULE SPECIFICATION

4.12.1.1 TECHNICAL SPECIFICATIONS

"Customer Administration Module"	
Code	**Technical Specification Description**
CAM-TS-1	The module is based on Java technology.
CAM-TS-2	The interface with other modules is provided in Table 65

Table 64: Customer Administration Module Technical Specifications

4.12.1.1.1 CUSTOMER ADMINISTRATION MODULE INTERFACE

Return Value	Interface/Function Name	Input Parameters	
int	*CreateCustomer*	**String**	Name
		String	Surname
		String	AddressStreet
		String	AddressStreetNumber
		String	PostalCode
		String	City
		String	Country
		String	TelephoneNumber
		String	UniqueCustomerID
		Boolean	Activate
Boolean	*EditCustomer*	**String**	Name
		String	Surname
		String	AddressStreet
		String	AddressStreetNumber
		String	PostalCode
		String	City
		String	Country
		String	TelephoneNumber
		String	CustomerID
		Boolean	Activate
Boolean	*DestroyCustomer*	**String**	CustomerID

Table 65: Customer Administration Module Interface

The ***CreateCustomer*** function adds a new customer in the *Customers Database* using the parameters passed and returns the CustomerID that is used to identify an elderly. The UniqueCustomerID parameter is a unique identifier generated by the *NumberGenerator Module*.

The ***EditCustomer*** function edits an existing customer from the *Customers Database* using the parameters passed and returns whether operation was successful or not.

The ***DestroyCustomer*** function removes/destroys an existing customer from the *Customers Database* identified by his/hers unique customer identification given by the *CustomerID* parameter.

4.12.1.2 FUNCTIONAL SPECIFICATIONS

"Customer Administration Module"	
Code	**Functional Specification Description**
CAM-FS-1	The Customer Administration module is responsible for customer entries management in the *Customers Database*

Table 66: Customer Administration Module Functional Specifications

4.12.2 NUMBERGENERATOR MODULE

4.12.2.1 TECHNICAL SPECIFICATIONS

"HOMEdotOLDCustomersDatabaseHibernateLibrary Module"	
Code	**Technical Specification Description**
NGM-TS-1	The module is based on Java technology.
NGM-TS-2	The module uses Java math library for generating random numbers.
NGM-TS-3	The interface with other modules is provided in Table 68

Table 67: NumberGenerator Module Technical Specifications

4.12.2.2 NUMBERGENERATOR MODULE INTERFACE

Return Value	**Function Name**	**Input Parameters**
int	*GenerateUniqueNumber*	

Table 68: NumberGenerator Module Interface

The ***GenerateUniqueNumber*** functions uses the Java math library for creating a random number and then queries the *Customers* database to check whether this number is already used. Operation repeats until number cannot be found in the database.

4.12.2.3 FUNCTIONAL SPECIFICATIONS

"NumberGenerator Module"	
Code	**Functional Specification Description**
NGM-FS-1	The *NumberGenerator Module* is responsible for creating random numbers.
NGM-FS-2	The *NumberGenerator Module* confirms that the randomly generated number does not exist in the *Customers Database*.

Table 69: NumberGenerator Module Functional Specifications

4.12.3 HOMEDOTOLD DATABASE CLIENT

4.12.3.1 TECHNICAL SPECIFICATIONS

"HOMEdotOLDCustomersDatabaseHibernateLibrary Module"	
Code	**Technical Specification Description**
HCDLM-TS-1	The module is based on Java technology.
HCDLM-TS-2	The module uses the Hibernate framework as the persistence layer for retrieving and storing plain old Java objects (POJOs) to a relational database.

Table 70: HOMEdotOLDCustomersDatabaseHibernateLibrary Module Technical Specifications

4.12.3.2 FUNCTIONAL SPECIFICATIONS

"HOMEdotOLDCustomersDatabaseHibernateLibrary Module"	
Code	**Functional Specification Description**
HCDLM-FS-1	Communication of the various modules and the *Customers* database is done through this module.
HCDLM-FS-2	The module through its Java implemented functionality gives access to the *Customers Database* tables and columns.

Table 71: HOMEdotOLDCustomersDatabaseHibernateLibrary Module Functional Specifications

5. HOMEDOTOLD HARDWARE SPECIFICATIONS

5.1 NETTV SPECIFICATIONS

Net TV in itself is not a hardware component. The TV set is a hardware component. The TV set comes with a software platform which is called Net TV. Specifications provided here include relevant TV set specifications, that are generic for TV sets that come with the Net TV platform, and relevant Net TV platform specifications.

5.1.1 TECHNICAL SPECIFICATIONS

"Net TV set"	
Code	**Technical Specification Description**
NETTV-TS-N1	The platform includes a CE-HTML browser
NETTV-TS-N2	The platform does supports limited Flash (i.e., Flash Lite),
NETTV-TS-N3	Pop-ups are achieved using web page overlays and can be controlled via jointSPACE applications (SPACE being an open source architecture developed by Philips to allow development of TV applications
NETTV-TS-N4	Screen resolution is 1920*1080p
NETTV-TS-N5	The TV including Net TV is controlled using a remote control that is suitable for Net TV internet browsing. It includes among other things a 'return' button, a quick button to get to the Net TV platform and a menu button that calls for an onscreen keyboard.
NETTV-TS-N6	The TV includes Ambilight Spectra 2[1]
NETTV-TS-N7	The TV is DLNA certified for media exchange
NETTV-TS-N8	4 x HDMI, 1 x USB, 2 x SCART, 1 x Ethernet, WiFi ready

Table 72: NetTV technical specifications

5.1.2 FUNCTIONAL SPECIFICATIONS

"Net TV set"	
Code	**Functional Specification Description**
NETTV-FS-N1	Interaction medium to use HOMEdotOLD services

Table 73: NetTV functional specifications

5.2 VIDEOCONFERENCING HARDWARE SPECIFICATIONS

The videoconferencing service runs on a PC connected to the TV with NetTV functionality via a HDMI-CEC command converter module. This allows control of the application as though it was a native application running on the TV set. Moreover a webcam is connected to the laptop.

5.2.1 TECHNICAL SPECIFICATIONS

"Net TV set"

[1] Philips Ambilight is a technology that intensified the viewing experience by LED lighting embedded in the TV frame that automatically adjusted following on-screen content.

Code	Technical Specification Description
VCRDHW-TS-N1	Laptop with Windows 7
VCRDHW-TS-N2	HDMI-CEC to USB and RS-232 Bridge
VCRDHW-TS-N3	Notebook webcam with microphone (Philips SPC640NC/00)
VCRDHW-TS-N4	Absolute pointer uWand technology with 3-button remote

Table 74: NetTV technical specifications

5.2.2 FUNCTIONAL SPECIFICATIONS

"Net TV set"	
Code	**Functional Specification Description**
NETTV-FS-N2	Interaction medium to use HOMEdotOLD services

Table 75: NetTV functional specifications

5.3 COMMUNICATION INFRASTRUCTURE

The following figure illustrates the communication infrastructure for aonTV.

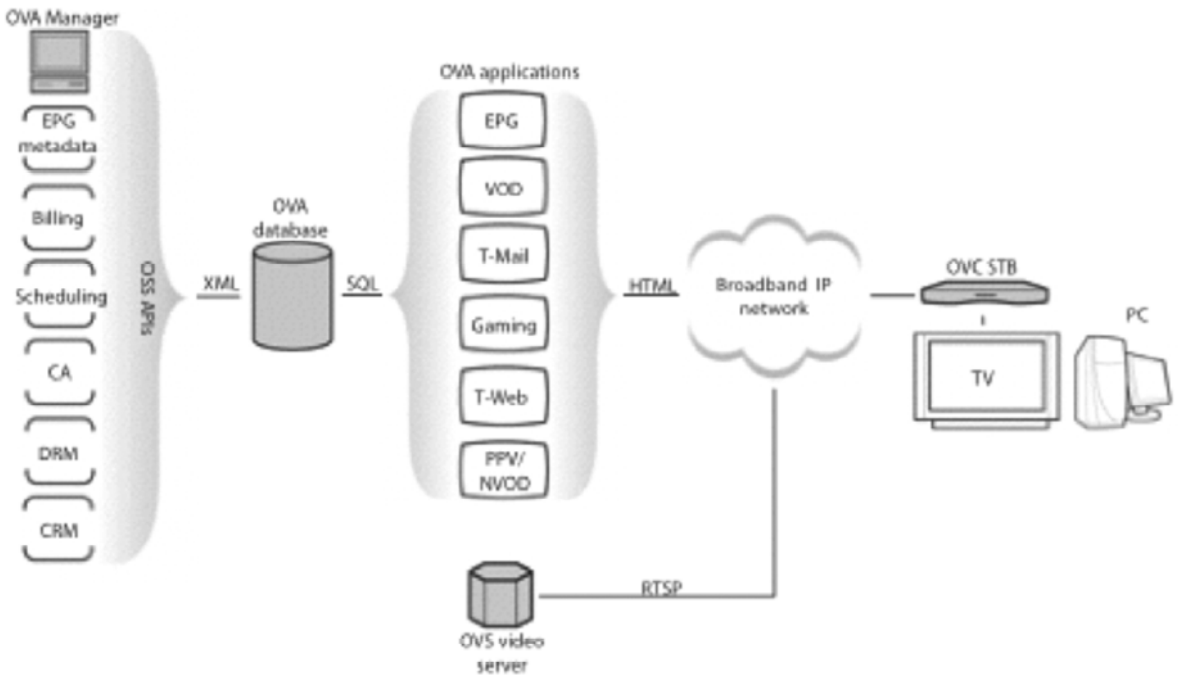

Figure 18: aonTV architecture and communication infrastructure

5.3.1 TECHNICAL SPECIFICATIONS

"aonTV Hardware&System"	
Code	**Technical Specification Description**
AONHWS-TS-1	STB provides HDMI and SCART for connection to TV
AONHWS-TS-2	STB user input by remote control (programmable for TV also)
AONHWS-TS-3	STB provides LED for notification in standby and ON state

AONHWS-TS-4	IPTV signal needs <4Mbits/s for downlink
AONHWS-TS-5	STB is a media player with a proprietary GUI
AONHWS-TS-6	Services are implemented server-side, not on client

Table 76: AonTV Hardware technical specifications

5.3.2 FUNCTIONAL SPECIFICATIONS

"aonTV Hardware&System"	
Code	**Functional Specification Description**
AONHWS-FS-1	The aonTV STB is the player for the HOMEdotOLD user for the reception of the services: video, images, RSS Feeds

Table 77: AonTV Hardware functional specifications

6. HOMEDOTOLD SOFTWARE IMPLEMENTATION PLAN

6.1 HOMEDOTOLD DATA MODELLING

The following schema constitutes the core database schema of the HOMEdotOLD bouquet of services. It holds the alias personal information, and all HOMEdotOLD services-required information.

HOMEdotOLD's data are stored in two distinct databases, shown in the following figures. One database holds the personal information of the users, and one holds all the information required by the HOMEdotOLD services.

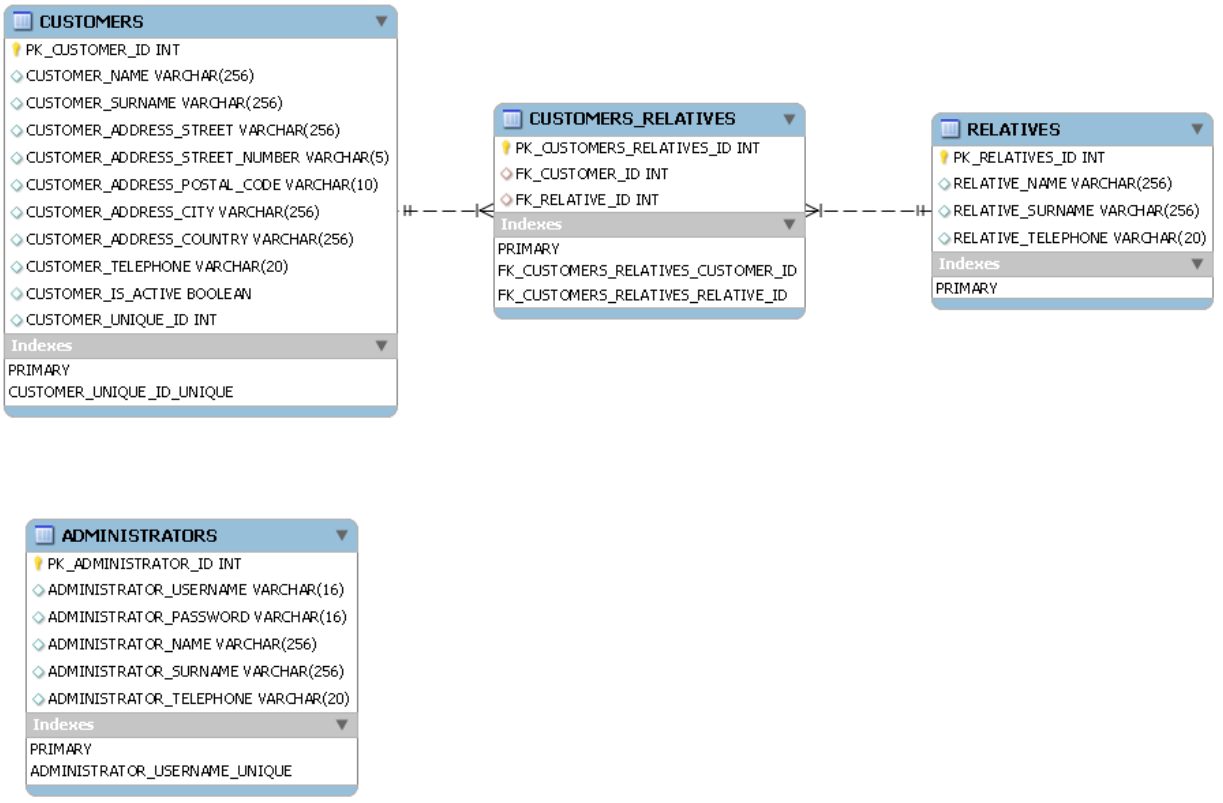

Figure 19: HOMEdotOLD Customers database schema

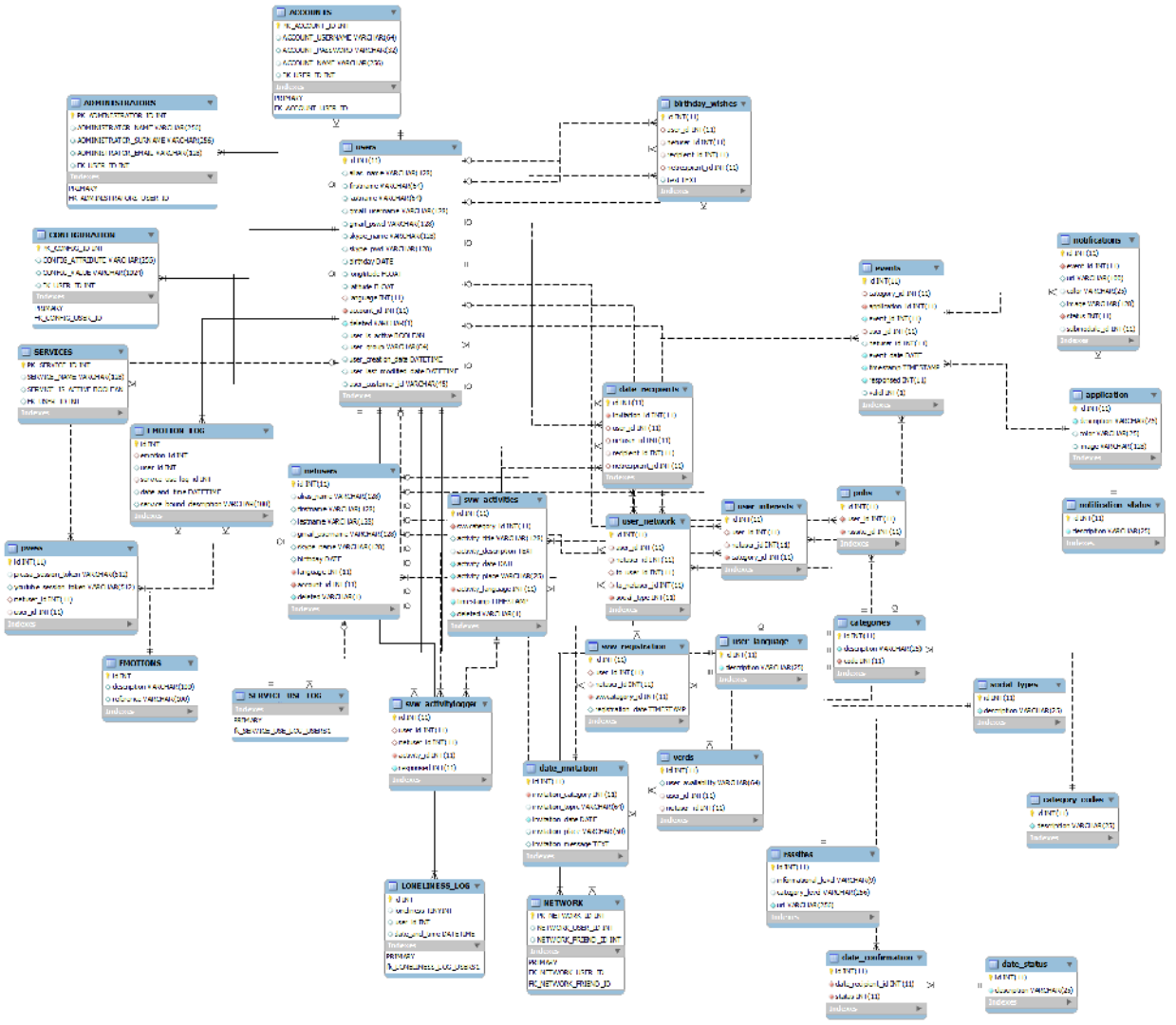

Figure 20: HOMEdotOLD Database schema

Data Modelling Explanation

The following table provides an analysis of the Customers Database Schema tables that are used for the implementation of the HOMEdotOLD bouquet of services.

Database Table Name	Database Table Description
Customers	Stores HOMEdotOLD's customers personal information such as their name, address, telephone, etc.
Relatives	Stores the personal information of the relatives of the users.
Customers_relatives	Contains information about which relative is whose user.
Administrators	Contains the personal information of the administrators of the platform.

Table 78: Customers data modelling specification

Database Table Name	Database Table Description
Users	Stores the HOMEdotOLD accounts username and password needed in order to login to the HOMEdotOLD platform. It is also used in order to store account statistics, like creation and modification dates.
Administrators	Stores the administrator names and e-mails.
Accounts	Stores information about a user's access permissions to the services offered by the platform (e.g HOMEdotOLD's services information).
Configuration	Contains information about the user's preferences for each service (e.g. The selected news categories a user wants to display news items from).
Network	Contains information about the user's network. Specifically, it contains which user is related to whom.
Emotions	Holds a description of the emotions that can be expressed by the user.
Emotion_log	Stores information about the emotion responses of a user, along with the time that these emotions were expressed.
Loneliness_log	Stores information about the user's state of loneliness along with the time and date that it was reported.
Service_use_log	Stores information about the usage of the services by the user.
Services	Stores information regarding which services an elderly user has access to.
application	Contains the application names which are involved in the HomeDotOLD services (i.e. Calendar, Social Voluntary Work etc.). The table is used by the Notification Module, in order to model the activities (swv activities, date invitations etc.) which have emerged from each application, for a specific user.
Birthday_wishes	Contains birthday cards details which are exchanged among the users
categories	Contains all the categories of activities used from the services. The table is used by the Intelligent Calendar and SVW module.
category_codes	Contains all the category codes. A category code shows the type of a category: SVW category, category of general interest etc.

date_confirmation	Stores the status (accept, decline, pending) of a date invitation between two users. The table is used by the Intelligent Calendar module.
date_invitation	Stores the details of a date invitation initiated by a user. The table is related to **date_recipients** table which stores the recipients of a specific invitation. The table is used by the Intelligent Calendar module.
date_recipients	Stores the recipients of a specific invitation. The table is related to **date_confirmation** table which stores the status of the date invitation between a specific sender and recipient. The table is used by the Intelligent Calendar module.
date_status	Contains the status values of a date (accept, decline, pending)
Events	Stores the events that have emerged and refer to a specific user. An event is stored whenever an activity, date invitation etc. is generated (and stored). Each event is emerged from an application and has a specific id. Thus, the table is related to **application** table and stores the id of the emerged activity/date invitation. As a result all type of activities emerging from all (different) applications are mapped under the same model and stored into the event table.
netusers	Stores the elderly user network (friends and relatives) alias name, the Google Gmail username needed in order to access their shared content areas both in the Picasa and the YouTube platforms, as well as the Skype account name used to identify them to the Skype network.
Notifications	Stores the notification related to a specific event. The table is related to **events** table to define the corresponding event. The table is related to **notification_status** table which stores the status description. The table is used by the Notification and the Intelligent Calendar module.
notification_status	Contains the status values of a notification(valid, invalid)
Pnhs	Stores configuration information regarding the "Personalised News headlines", in the form of a mapping table between elderly user ids' and RSS sites ids'
Pvess	Stores the Picasa and YouTube session information either for the elderly user or the elderly network.
Rsssites	Stores list of RSS site information, including actual URL and informational level as well as the category level.
social_types	Contains the social type values of users who belong in the network of a specific user (ie. relative, friend etc.).
svw_activites	Stores the svw activites. The table is related to **categories** table which stores the category description of an activity. The table is used by the SVW module.
svw_activitylogger	Stores the svw activites of a user. The table is related to **user** table which stores the user information and the **svw_activites** table which stores the svw activity information. The table is used by the SVW module.
svw_registration	Stores the registration of a user to a specific svw category. The table is related to **user** table which stores the user information and the **categories** table which stores the svw activity information. The table is used by the

	SVW module.
user_interests	Stores the user preferences concerning the available categories of activities. The table is related to **user** table which stores the user details. The table is related to **categories** table which stores the category description of an activity. The table is used by the Authentication module.
user_language	Stores the available languages, supported by the services. The table is used by the Authentication module.
user_network	Stores user network information, by providing mapping information between a user and their network as well as their social type (friend, relative).
Vcrds	Stores availability information for the user and the user network.

Table 79: Data modelling specifications

6.2 HOMEDOTOLD SOFTWARE IMPLEMENTATION & INTEGRATION PLAN

The current section provides a preliminary estimation of the HOMEdotOLD bouquet of services software implementation and integration plan. The following tables provide the implementation plan and integration plan of all software modules to be implemented within the context of the project, the interoperability relationship amongst them, as well as the deployment plan of the defined services, after successful integration of all corresponding modules.

Module Name	Module Short Name
Session Handling Module	SHM
User Profile Module	UPM
Event Handling Module	EHM
Notification Module	NM
Calendar Module	CM
Date Invitation Module	DIM
Preference Matching Module	PMM
Social Voluntary Work Module	SVWM
Social Voluntary Work Notification Module	SVWNM
NumberGenerator Module	NGM
Customer Administration Module	CAM
HOMEdotOLDCustomersDatabaseHibernateLibrary Module	HCDHLM
HOMEdotOLDUsersDatabaseHibernateLibrary Module	HUDHLM
System Administration Module	SAM
Affective Modality Module	AMM
Authentication Module	AUTHM
Policy Management Module	PMM

Picasa Module	PM
Skype Module	SM
RSS Feeds Module	RSSM
AonTV Module	ATVM
Photos, Videos, Experience Sharing Application Logic	PVESAL
Personalised News Headlines Application Logic	PNHAL
Videoconference and Remote Dinning Application Logic	VRDAL
HOMEdotOLD Customers Database	HCD
HOMEdotOLD Users Database	HUD
Customer Administration HMI	CAHMI
System Administration HMI	SAHMI
User HMI	UHMI
Friends and family HMI	FFHMI

Table 80: HOMEdotOLD modules abbreviations

Module	Interoperability with Modules	Module Implementation (Month / Date)
SHM	All modules	M9 / March 2011
UPM	PMM, CM	M9 / March 2011
EHM	DIM, NM, SVWM	M9 / March 2011
NM	EHM, CM, SVWNM	M9 / March 2011
CM	UPM, NM	M9 / March 2011
DIM	EHM, CM	M9 / March 2011
PMM	UPM, SVWM	M9 / March 2011
SVWM	EHM, PMM, SVWNM	M9 / March 2011
SVWNM	NM, SVWM	M9 / March 2011
HCD	HCDHLM	M8 / February 2011
HUD	HUDHLM	M9 / March 2011
NGM	HCDHLM	M8 / February 2011
CAM	HCDHLM	M8 / February 2011
HCDHLM	HCD	M8 / February 2011
HUDHLM	HUC	M9 / March 2011
SAM	HUDHLM	M9 / March 2011
AFM	AUTHM, PMM	M9 / March 2011
AUTHM	AFM, PMM	M9 / March 2011
PMM	AFM, AUTHM	M9 / March 2011
YTM	HUDHLM, PVESAL	M10 / April 2011

PM	HUDHLM, PVESAL	M9 / March 2011
SM	HUDHLM, VRDAL	M9 / March 2011
RSSM	HUDHLM, PNHAL	M9 / March 2011
ATVM	ATVM	M10 / April 2011
PVESAL	HUDHLM, PM, YTM	M10 / April 2011
PNHAL	HUDHLM, RSSM	M9 / March 2011
VRDAL	HUDHLM, SM	M10 / April 2011
CAHMI	CAM, HCDHLM	M8 / February 2011
SAHMI	SAM, HUDHLM	M9 / March 2011
FFHMI	HUDHLM, PVESAL	M10 / April 2011
UHMI	HUDHLM, PVESAL, PNHAL, VRDAL	M11 / May 2011

Table 81: HOMEdotOLD software implementation plan

Service	Modules Involved	Integration of modules (Month / Date)	Service Deployment (Month / Date)
SVW	SHM, EHM, NM, UPM, PMM, SVWM, SVWNM	M12 / June 2011	M13 / July 2011
PNH	SAM, HUDHLM, AMM, AUTHM, PMM, RSSM, ATM, PNHAL	M12 / June 2011	M13 / July 2011
IC	SHM, EHM, NM, UPM, CM, DIM	M12 / June 2011	M13 / July 2011
VC	SAM, HUDHLM, AMM, AUTHM, PMM, SM, VRDAL	M12 / June 2011	M13 / July 2011
RD	SAM, HUDHLM, AMM, AUTHM, PMM, SM, VRDAL	M12 / June 2011	M13 / July 2011
PVES	SAM, HUDHLM, AMM, AUTHM, PMM, PVESAL, YTM, PM, ATM	M12 / June 2011	M13 / July 2011

Table 82: HOMEdotOLD integration plan

The current implementation and integration plan includes relevant activities until the 1st deployment of the services centrally at pilot sites, which will be done on M13 (July 2011).

Following an initial experimentation of the users with the services and their feedback, an additional implementation and integration period will take place between M16-M19 before the final deployment of the services to the houses of the selected users.

Since the user feedback and as a consequence the affected modules cannot be currently known, the plan for the 2nd implementation and integration phase cannot be provided in detail at this stage.

7. SECURITY MEASURES

The nature of the HOMEdotOLD services, which are web-based services running on the HOMEdotOLD Application Server, requires that the user data shall be stored on the Service Provider side. This shall be done following the written agreement (informed consent) of the potential users/patients that are subscribed to the services. The transmission of these data over the public Internet or a private IP network (AonTV case) is performed over secure communication technologies. All communication interfaces are based on Internet technologies supporting standard and well established security mechanisms including SSL, HTTPS and Secure Web Services.

In order to further protect the user data at storage level, these are stored in the database and are related to a random user ID and not his/her real details. Even the interfaces to external systems (the web services) never include user identification data (such as their full names), just their IDs. They are only known to a Service Provider where a user/customer/account is created and are only handled by the administrator who creates the user account. Further details regarding the functionality of this scheme are provided in section 4.12.

8. CONCLUSIONS

The current deliverable has approached the HOMEdotOLD platform from a technical and systemic perspective of view. The consortium technical partners have gathered and presented the requirements that will lead to and guide through the project implementation. The HOMEdotOLD bouquet of services that will be provided to the end-users has been defined and analysed, specifying in detail the functional and technical requirements of each service, upon which their development will be based. The conceptual architecture of the HOMEdotOLD platform, which will facilitate the provision of the aspired bouquet of services, has been analysed, while the systemic components and modules that will comprise the holistic HOMEdotOLD architecture have been defined in specific, and their functional and technical specifications have been analysed. The hardware specifications of the platform have also been specified and have been presented in chapter five of the current document, while the HOMEdotOLD software implementation and integration plan has also been prepared and presented.

The current document will constitute the guide upon which the implementation of the HOMEdotOLD bouquet of services will be based. However, the actual development of the services may deviate from the foreseen plan, in which case the current document will be modified accordingly.

ANNEX I REQUIREMENT MAPPING MATRIX (TT)

This Annex provides a consolidated mapping matrix between:

1. The Functional and technical requirements of each service.
2. The HOMEdotOLD technical requirements identified and analysed in Deliverable D.2.1 (Chapter 5)
3. The HOMEdotOLD user requirements identified and analysed in Deliverable D.2.1 (Chapter 2)
4. The HOMEdotOLD use cases identified and analysed in Deliverable D.2.1 (Chapter 3)

Service Requirement ID	HOMEdotOLD technical requirements	HOMEdotOLD user requirements	HDO use cases	HDO 1st version	HDO 2nd version
Social Voluntary Work Service					
SVW-FS-01	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-02	HOMEdotOLD-A-00003	HOMEdotOLD-GR-S-2,3,4 HOMEdotOLD-NL-I-2,3,4	2.1, 2.2, 2.3	√	
SVW-FS-03	HOMEdotOLD-C-00012	HOMEdotOLD-AUT-I-2 HOMEdotOLD-NL-I-6	2.2, 2.3	√	
SVW-FS-04	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-05	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-06	HOMEdotOLD-A-00008,9 HOMEdotOLD-I-00009 HOMEdotOLD-S-00005,7,8 HOMEdotOLD-T-00002,3	-	2.1, 2.2, 2.3	√	
SVW-FS-07	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-08	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	

SVW-FS-09	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-10	HOMEdotOLD-A-00001,2,8,9 HOMEdotOLD-C-00006,9,11 HOMEdotOLD-I-00001,9 HOMEdotOLD-S-00001,3 HOMEdotOLD-T-00002,3	HOMEdotOLD-GR-S-1,3,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2	√	
SVW-FS-11	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-FS-12	HOMEdotOLD-A-00002 HOMEdotOLD-C-00006,9,11 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-TS-01	HOMEdotOLD-S-00001-8	-	2.1, 2.2, 2.3	√	
SVW-TS-02	HOMEdotOLD-S-00003 HOMEdotOLD-T-00003	-	2.1, 2.2, 2.3	√	
SVW-TS-03	HOMEdotOLD-C-00012 HOMEdotOLD-S-00006,7,8 HOMEdotOLD-T-00002	-	2.1, 2.2, 2.3	√	
SVW-TS-04	HOMEdotOLD-A-00001 HOMEdotOLD-C-00003,7,8	-	2.1, 2.2, 2.3	√	
SVW-TS-05	-	HOMEdotOLD-GR-S-3	2.1, 2.2	√	
SVW-TS-06	HOMEdotOLD-C-00012 HOMEdotOLD-S-00006,7,8 HOMEdotOLD-T-00002	-	2.1, 2.2, 2.3	√	
SVW-TS-07	HOMEdotOLD-T-00003	-	-	√	
SVW-MIFS-01	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009 HOMEdotOLD-I-00001	HOMEdotOLD-GR-S-5 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	2.1, 2.2, 2.3	√	
SVW-MIFS-02	HOMEdotOLD-A-00003	HOMEdotOLD-GR-S-2,3,4 HOMEdotOLD-NL-I-2,3,4	2.1, 2.2, 2.3	√	
SVW-MIFS-03	-	HOMEdotOLD-GR-S-1	2.1, 2.2, 2.3	√	
SVW-MITS-01	-	HOMEdotOLD-GR-S-1	2.1, 2.2, 2.3	√	

SVW-IESFS-01	HOMEdotOLD-C-00006	-	2.1, 2.3	√	
SVW-IESTS-01	HOMEdotOLD-C-00006	-	2.1, 2.3	√	
Personalised News Headlines Service					
PNH-FS-A1	HOMEdotOLD-A-00009	-		√	
PNH-FS-A2	-	-		√	
PNH-FS-A3	-	-		√	
PNH-FS-A4	-	-		√	
PNH-FS-A5	-	-		√	
PNH-FS-E1	HOMEdotOLD-A-00002, HOMEdotOLD-A-00003	-		√	
PNH-FS-E2	-	HOMEdotOLD-GR-S-5	5.1, 5.2	√	
PNH-FS-E3	-	HOMEdotOLD-GR-S-2, HOMEdotOLD-AUT-S-1, HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	5.1, 5.2	√	
PNH-FS-E4	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	5.1, 5.2	√	
PNH-FS-E5	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	5.1	√	
PNH-FS-E6	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	5.2	√	
PNH-MIFS-1	-	-		√	
PNH-MIFS-2	HOMEdotOLD-I-00002	HOMEdotOLD-AUT-I-1	5.1, 5.2	√	
PNH-MIFS-3	HOMEdotOLD-A-00004	HOMEdotOLD-GR-S-1	-		√
PNH-MIFS-4	HOMEdotOLD-A-00003	HOMEdotOLD-NL-I-2	-	√	
PNH-MIFS-5	HOMEdotOLD-A-00004	-	-		√
PNH-MITS-1	HOMEdotOLD-C-00009	-	-	√	
PNH-MITS-2	-	-	-	√	
PNH-MITS-3	HOMEdotOLD-S-00002	-	-	√	
PNH-MITS-4	HOMEdotOLD-S-00006	-	-	√	
PNH-MITS-5	HOMEdotOLD-S-00008	-	-	√	
PNH-MITS-6	-	HOMEdotOLD-GR-S-1	-		√
PNH-IESFS-1	-	-	-	√	
PNH-IESTS-1	-	-	-	√	
Intelligent Calendar Service					
IC-FS-01	HOMEdotOLD-A-00001,2 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-5 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5	1.1,1.2,1.3	√	
IC-FS-02	HOMEdotOLD-A-00001,2	HOMEdotOLD-GR-S-5	1.1,1.2,1.3	√	

	HOMEdotOLD-C-00009,12 HOMEdotOLD-S-00004 HOMEdotOLD-T-00002 HOMEdotOLD-I-00003,7	HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5			
IC-FS-03	HOMEdotOLD-A-00002,3,4,5	HOMEdotOLD-GR-S-1,2,3 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.2,1.3	√	
IC-FS-04	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.2,1.3	√	
IC-FS-05	HOMEdotOLD-A-00001,2 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-5 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5	1.2,1.3	√	
IC-FS-06	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	
IC-FS-07	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	
IC-FS-08	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8 HOMEdotOLD-C-00001,2,9,12 HOMEdotOLD-T-00002	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7 HOMEdotOLD-NL-S-2	1.1,1.3	√	
IC-FS-09	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	
IC-FS-10	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	
IC-FS-11	HOMEdotOLD-A-00001,2,3,4,5 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-1,2,3,5 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	
IC-FS-12	HOMEdotOLD-A-00001,2,3,4,5,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-1,2,3,5,6 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.1,1.3	√	

IC-FS-13	HOMEdotOLD-A-00001,2,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5	1.1,1.2,1.3	√	
IC-FS-14	HOMEdotOLD-A-00001,2,3,4,5,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-1,2,3,5,6 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.2	√	
IC-FS-15	HOMEdotOLD-A-00001,2,3,4,5,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-1,2,3,5,6 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.2	√	
IC-FS-16	HOMEdotOLD-A-00001,2,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-5,6 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5	1.2	√	
IC-FS-17	HOMEdotOLD-A-00001,2,3,4,5,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-1,2,3,5,6 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	-	√	
IC-FS-18	HOMEdotOLD-A-00001,2,3,4,5,8 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003,7 HOMEdotOLD-S-00007,8	HOMEdotOLD-GR-S-1,2,3,5,6 HOMEdotOLD-AUT-I-1,2 HOMEdotOLD-NL-I-2,3,4,6,7	1.2		√
IC-TS-01	HOMEdotOLD-S-00001-8	-	1.1, 1.2, 1.3	√	
IC-TS-02	HOMEdotOLD-S-00003 HOMEdotOLD-T-00003	-	1.1, 1.2, 1.3	√	
IC-TS-03	HOMEdotOLD-C-00012 HOMEdotOLD-S-00006,7,8 HOMEdotOLD-T-00002	-	1.1, 1.2, 1.3	√	
IC-TS-04	HOMEdotOLD-A-00001 HOMEdotOLD-C-00003,7,8	-	1.1, 1.2, 1.3	√	
IC-TS-05	-	HOMEdotOLD-GR-S-3	1.1, 1.2	√	
IC-TS-06	HOMEdotOLD-A-00004,5	HOMEdotOLD-GR-S-1	1.1, 1.2, 1.3	√	
IC-TS-07	HOMEdotOLD-C-00012 HOMEdotOLD-S-00006,7,8 HOMEdotOLD-T-00002	-	1.1, 1.2, 1.3	√	
IC-TS-08	HOMEdotOLD-T-00003	-	-	√	
IC-MIFS-01	HOMEdotOLD-A-00002 HOMEdotOLD-C-00009 HOMEdotOLD-I-00003	HOMEdotOLD-GR-S-5 HOMEdotOLD-AUT-I-1 HOMEdotOLD-NL-I-1,5,6,7	1.1, 1.2, 1.3	√	
IC-MIFS-02	HOMEdotOLD-A-00003	HOMEdotOLD-GR-S-2,3,4 HOMEdotOLD-NL-I-2,3,4	1.1, 1.2, 1.3	√	
IC-MIFS-03	-	HOMEdotOLD-GR-S-1	1.1, 1.2, 1.3	√	
IC-MITS-01	-	HOMEdotOLD-GR-S-1	1.1, 1.2, 1.3	√	
Videoconferencing & Remote Dining Service					

VCRD-FS-A1	HOMEdotOLD-A-00009	-			-
VCRD-FS-A2	-	-	-		
VCRD-FS-A3	-	-	-		
VCRD-FS-E1	HOMEdotOLD-A-00002, HOMEdotOLD-A-00003	-	4.1, 6.1		
VCRD-FS-E2	-	HOMEdotOLD-GR-S-2, HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	4.1, 6.1		
VCRD-FS-E3	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	4.1, 6.1		
VCRD-FS-E4	HOMEdotOLD-C-00004	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	4.1, 6.1		
VCRD-FS-E5	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1, HOMEdotOLD-NL-S-2	4.1, 6.1		
VCRD-FS-E6	HOMEdotOLD-A-00003	HOMEdotOLD-NL-I-2	4.1, 6.1		
VCRD-FS-E7	HOMEdotOLD-A-00004, HOMEdotOLD-A-00005, HOMEdotOLD-I-00004	-	4.1, 6.1		
VCRD-FS-E8	HOMEdotOLD-C-00011	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	4.1, 4.2, 6.1		
VCRD-FS-E9	HOMEdotOLD-C-00002	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	-		
VCRD-FS-N1	HOMEdotOLD-A-00009	-	-		
VCRD-FS-N2	HOMEdotOLD-A-00009	-	-		
VCRD-TS-1	HOMEdotOLD-I-00004, HOMEdotOLD-C-00009	-	4.1, 4.2, 4.3, 6.1		
VCRD-TS-2	-	-	-		
VCRD-TS-3	-	-	-		
VCRD-MIFS-1	-	-	-		
VCRD-MIFS-2	HOMEdotOLD-C-00005, HOMEdotOLD-C-00007, HOMEdotOLD-I-00008	-	4.1, 4.2, 4.3, 6.1		
VCRD-MIFS-3	HOMEdotOLD-I-00004	HOMEdotOLD-AUT-I-1	4.1, 4.2, 4.3, 6.1		
VCRD-MIFS-4	HOMEdotOLD-C-00011	-	4.2, 6.1		
VCRD-MIFS-5	HOMEdotOLD-A-00003	HOMEdotOLD-NL-I-2	-		
VCRD-MIFS-6	HOMEdotOLD-A-00005	-	-		
VCRD-MITS-1	HOMEdotOLD-C-00009	-	-		
VCRD-MITS-2	HOMEdotOLD-S-00002	-	-		

VCRD-MITS-3	HOMEdotOLD-S-00006	-	-		
VCRD-IESFS-1	-	-	-		
VCRD-IESTS-1	-	-	-		
Photos, Videos & Experience Service					
PVES-A1	HOMEdotOLD-A-00009	-	-	√	
PVES-A2	-	-	-	√	
PVES-A3	-	-	-	√	
PVES-E1	HOMEdotOLD-A-00002, HOMEdotOLD-A-00003	-	-	√	
PVES-E2	-	HOMEdotOLD-GR-S-5	3.1, 3.2, 3.3	√	
PVES-E3	-	HOMEdotOLD-GR-S-2, HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.1, 3.2, 3.3	√	
PVES-E4	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.1, 3.2, 3.3	√	
PVES-E5	HOMEdotOLD-I-00006	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.1, 3.2	√	
PVES-E6	HOMEdotOLD-A-00003	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1, HOMEdotOLD-NL-I-2	3.2, 3.3	√	
PVES-E7	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.2	√	
PVES-E8	HOMEdotOLD-I-00006	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.1, 3.2	√	
PVES-E9	HOMEdotOLD-A-00003	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1, HOMEdotOLD-NL-I-2	3.2	√	
PVES-E10	-	HOMEdotOLD-AUT-I-2, HOMEdotOLD-NL-I-1	3.2	√	√
PVES-E11	-	-	3.3	√	v
PVES-N1	HOMEdotOLD-A-00009	HOMEdotOLD-GR-S-7	3.1, 3.2	√	
PVES-N2	-	-	3.1, 3.2	√	
PVES-N3	HOMEdotOLD-I-00009	-	3.1, 3.2	√	
PVES-N4	HOMEdotOLD-I-00009	-	3.1, 3.2		√
PVES-TS-1	HOMEdotOLD-C-00009	-	-	√	
PVES-TS-2	-	-	-	√	
PVES-TS-3	-	-	-	√	
PVES-TS-4	-	-	-	√	
PVES-TS-5	-	-	-	√	
PVES-TS-6	-	-	-	√	
PVES-TS-7	HOMEdotOLD-S-00001	-	-	√	

PVES-MIFS-1	-	-	-	√	
PVES-MIFS-2	HOMEdotOLD-I-00005	HOMEdotOLD-AUT-I-1	-	√	
PVES-MIFS-3	HOMEdotOLD-I-00005	-	3.3	√	
PVES-MIFS-4	HOMEdotOLD-C-00002	-	3.2		
PVES-MIFS-5	HOMEdotOLD-A-00004	HOMEdotOLD-GR-S-1	-		
PVES-MIFS-6	HOMEdotOLD-A-00003	HOMEdotOLD-NL-I-2	-	√	
PVES-MIFS-7	HOMEdotOLD-A-00004	-	-	√	
PVES-MITS-1	HOMEdotOLD-C-00009	-	-	√	
PVES-MITS-2	-	-	-	√	
PVES-MITS-3	HOMEdotOLD-S-00002	-	-	√	
PVES-MITS-4	HOMEdotOLD-S-00006	-	-	√	
PVES-MITS-5	HOMEdotOLD-S-00008	-	-	√	
PVES-MITS-6	-	HOMEdotOLD-GR-S-1	-	√	
PVES-IESFS-1	-	-	-	√	
PVES-IESTS-1	-	-	-	√	

Table 83: Consolidated requirement mapping matrix

ANNEX II – SPECIFICATION CODING

The specifications of all services in the current deliverable were coded according to the following scheme: Each specification ID consists of three main parts: PartA-PartB-PartC

PartA of the specification ID regards to the service itself. The following abbreviations were utilised:

Service Abbreviation	Service Full Name
SVW	Social Voluntary Work
PNH	Personalised News Headlines
IC	Intelligent Calendar
VCRD	Cideoconferencing & Remote Dining
PVES	Photos, Videos & Experience Sharing

Table 84: Requirement specification coding PartA

PartB of the specification ID refers to the nature of the specification. The following abbreviations were utilised:

Specification Nature Abbreviation	Specification Nature Full Name
FS	Functional Specification
TS	Technical Specification
MIFS	Multimodal Interface Functional Specification
MITS	Multimodal Interface Technical Specification
IESFS	Interface with External Services Functional Specification
IESTS	Interface with External Services Technical Specification

Table 85: Requirement specification coding PartB

PartC of the specification ID refers to the auto-increment number of the specification.

