Deliverable 2.3

Unified Requirements

Project Number	AAL-2012-5-249
Project Name	MYLIFEMYWAY
Duration	March 2016 – Feb 2019 (36 Months)
Coordinator	Engie
Document ID	D 2.3
Release Number /Date	V2.0/April 2018
Document Status	Released
Document Type	Project Deliverable
Original Due Date	February 2018
Dissemination Level	Public
Main Editor	Daniel Bolliger (iHL)
Contributing Partners	iHL, HAN, UCLL, VIR, ENG
Reviewed by	VIR

Abstract

In the MLMW project proposal submitted, the requirements are scattered on several deliverables. At the mid-term review a valuable input from the experts in the review team was, to concentrate – consolidate all different kinds of requirements to one master document.

This document with the title" MyLifeMyWay Requirements" joins the multiple requirement parts in this master document. It helps to get a comprehensive overview on all requirements aspects in the project and the resulting system MyLifeMyWay. It unifies the different perspectives: **user**, **technology** and **business**.

What is new in this Version 2.0 – compared to MTR in November 2017

All requirements are scatterd over the different workpackages and deliveries. A blocking recommendation of the MTR report was, to consolidate the different aspects of requirements in one document.

The consortium decided to follow this recommendation by generating this new deliverable D2.3 Unified Requirements. It condenses the essence of the different requirement perspectives. For each perspective a chapter is available. All these requirements are taken into account by definition of the systems architecture, as described in the deliverable D3.1

Version	***Date***	***Changes***	***Name***	***Organisation***
1.0	2018-01-31	Initial Creation	Daniel Bolliger	IHL
1.1	2018-01-31	Technical Requirements	Daniel Bolliger	IHL
1.2	2018-02-05	Usability Requirements	Herman Slagman	VIR
1.3	2018-02-06	Security and Privacy Policy	Herman Slagman	VIR
1.4	2018-02-06	Business Requirements	Herman Slagman	VIR
2.0	April 2018	Consolidate all requirements aspect with the actualized version of the source Deliverables – status end March 2018 Review and Release of D2.3 V2.0	Daniel Bolliger with Inputs from Sylvia Hoekstra, Ellen Steenmeijer, Dennis Kleinbussink	IHL

The MyLifeMyWay project is Co-funded by the European AAL Joint Programme

List of Authors

Sylvia Hoekstra (HAN)	User Requirements (D2.2)
Daniel Bolliger (IHL)	Technical Requirements (D3.1)
Dennis Kleinbussink (VIR)	Usability Requirements (D3.2)
Daniel Bolliger (IHL)	Security and Privacy Policy (D3.3)
EllenSteenmeijr (VIR)	Business Requirements (D6.3

Content:

1 Introduction

1.1 Related Deliverables

In the project MyLifeMyWay there is a constant involvement of the end users. It is important, that they influence the end-product, along their needs and wishes. The information gathered in the WP5 is analysed and concentrated into the D2.2 **user requirements**. It highlights the expectations and needs of the end users towards MLMW. As a result we have there a prioritized list or end user requirements. This view is reflected in chapter 2 of this document.

That the product MLMW become successful in the market, it is also important, that it fits to the **business constraints**, that are developed in WP5. The derived requirements from this perspective are described in chapter 0 of this document.

To make the MLMW system operable with ease there we defined the **usability requirements** of the system in the separate deliverable D3.2. The goal is to define the user interaction requirements suitable for our target user group. In this docu chapter 4.

All privacy and security relevant aspects are described in detail in the deliverable D3.3 **security and privacy policy**. It is for the project and system MLMW important, that all information flowing into and from the system are treated with special attention to privacy and security. In this document, all privacy and security essentials are outlined in chapter 0.

The system architecture is dependent heavily on the above described different partial requirements. Everything is the translated to the **functional and non-functional technical requirements**. They can be found in deliverable D2.1 and in this document in chapter 3

We hope to build an overall picture on all requirements aspects that play a major role in the system conception of MLMW – Anne.

1.2 Project Phases

The requirements evolve over time. The project team gets more and more insight to the user wishes and needs, understands better the business opportunities, and sees new chances and threads during the technology development.

During the whole project duration, there are three user research phases, aligned to the major system rollout stages. The current document reflects the base requirements and the realization requirements of phase I of the system.

The functional requirements will be updated to phase II and phase III of the system accordingly during the project. If there is any change in the project or system environment. This will be reflected in the specific requirements parts too.

2 End User Requirements (D2.2)

The end user requierements development process is described in detail in the deliverable D2.2 The last two chapters of this deliverable (Chapter 7 Criteria for Definition of Additional Features of Anne and – Chapter 8 Consolidated Prioritised Feature List) give an comprehensive overview on the end user requirements and are here represented:

2.1 Criteria for Definition of additional Features of Anne

2.1.1 End User Perspective

Feedback given on the existing V0 of Anne (during the first field test period: phase I) on general and specific usability have to be taken into account with high priority. This is important because:

- the user experience with the improvements directly that they can influence the project. This is highly motivating
- Often the usability increases significant by putting small development effort to a specific point (low hanging fruits)
- Make the whole system more attractive, by adding the most wanted missing features. So the users are encouraged to use the system in their daily life.

2.1.2 End User Organisation Perspective

Give the end user organisations added value with Anne, try to make their life more easy for them by supporting their business processes. Facilitate communication with their clients, which use Anne.

2.1.3 Effort and Timeline

Bringing together all the desirability from sections 2.1.1 to 2.1.3 of D2.2 there is a long 'wish list'. This list has to be prioritized against the following aspects:

- What has the highest impact to improve the acceptance/attractiveness/use to the majority of all stakeholders?
- What *can* be done with the available development resources in the project flow?
- How the developed features can be bundled in meaningful packages?

2.1.4 Funding Perspective

We have given in our accepted project proposal different key points, which have to be full filled towards our funding agencies. Scientific goals and challenges are also comprised therein:

- Personal virtual avatar
- Different languages
- Home automation
- Collaborative artificial intelligence

2.2 Consolidated Prioritised Feature List

As discussed in the previous chapters, it is essential to choose the next feature set in a way to maximise the attractiveness for all stakeholders, while keeping the development effort (and delivery schedule) at an acceptable level. So for discussion/decision in the consortium the following set is proposed.

Take into account, that video call and home automation at current state are advanced quite far already, so this must be feasible to deliver this features in time planned for phase II and IIb. The backend features are important to leverage the attractiveness for end user organisations.

Meanwhile improvements of currently available features and usability enhancements have a big attractiveness impact of the whole system.

This resulted in the next proposal for a feature list, visualised in

Almost available	Moderate effort	Develop from scratch
Video call	End User Organization specific page	Usability: Context-Sensitive Speech Commands
Domotica prototype	Usability: Clickable vs. non clickable	System Information – Feedback dialogues
General improvements existing features	Calendar and Medication improvements	New feature: weather forecast
	News: commands and layout	New feature: Card games
		New feature: Listen to news or Podcasts
		New feature: Listen to radio station
		Read aloud: Texts ebooks recipes

Table 1 Proposal Desirable Features of Anne

The consortium decided during a stakeholder meeting (20 December 2017) to choose for improving and developing the following features phase II:

- Improvement of usability in general (language, performance, minor improvements)
- Improvement of existing features (general agenda, medical agenda, news)
- New feature Videocall
- New feature Gaming

- New feature Radio

To give an idea what and how these features would like, the next slides give a more specific visualised view.

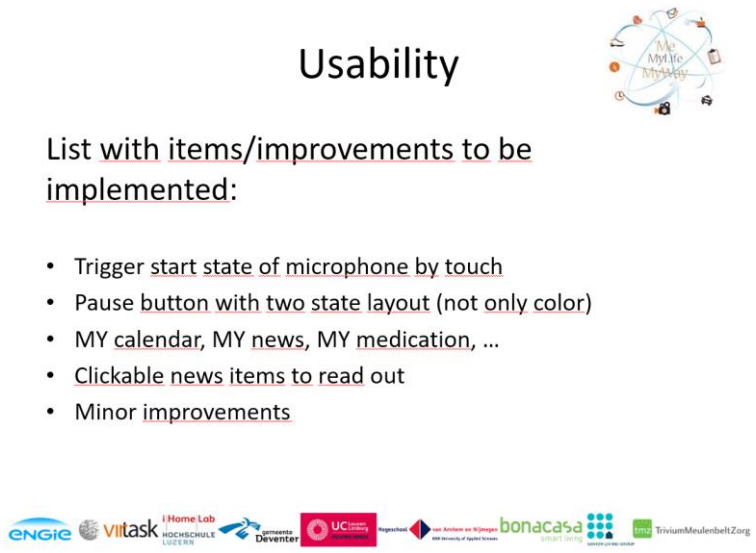

Figure 1: Usability Improvements

Figure 2: Video Calling Functionality

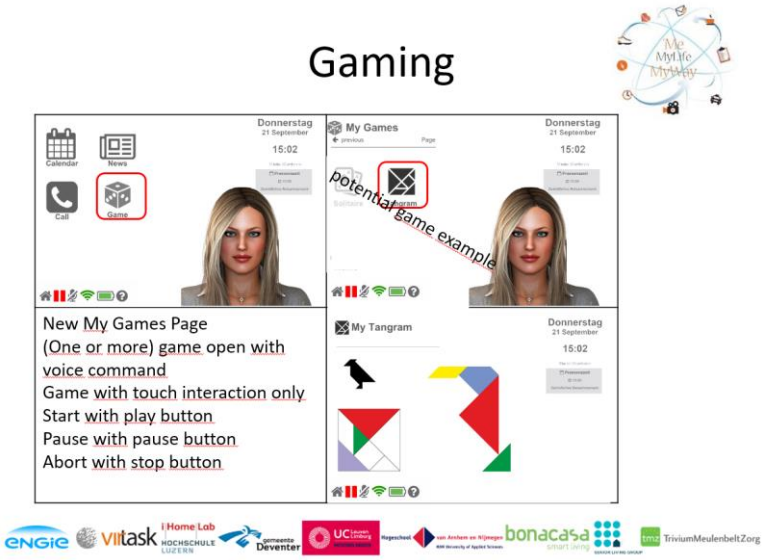

Figure 3: Gaming Functionality

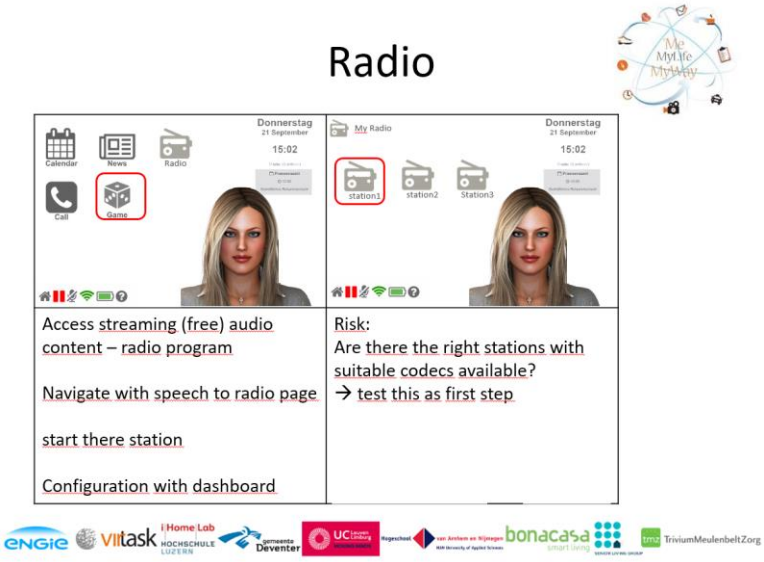

Figure 4: Radio Functionality

For the Phase IIb the home automation users (only in Switzerland) will have additional to the features above the following functionality available in summer 2018:

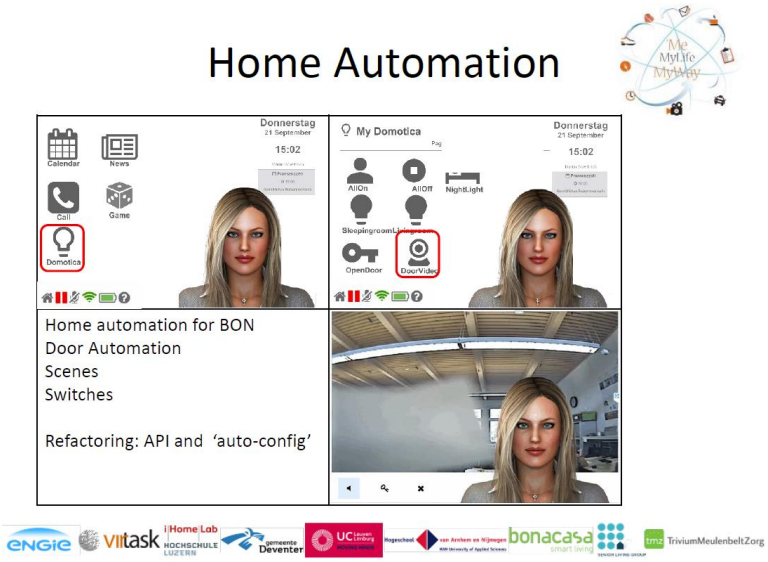

Figure 5: Home Automation

The final release will be available in January 2019 for the end users. The planned features set will be:

Figure 6: Planned Feature Set Phase III

The details for Usability+ and Games+ and additional features will be defined with the outcome of the research activities of Phase II and the strong inclusion of our end users. This is scheduled in the period may-november 2018.

A decision is already made on the service page feature. This feature cannot be implemented already in phase II. Architectural reasons require a refactoring of some parts of the code. In order not compromise SW stability of Phase II the consortium moved this feature to Phase III.

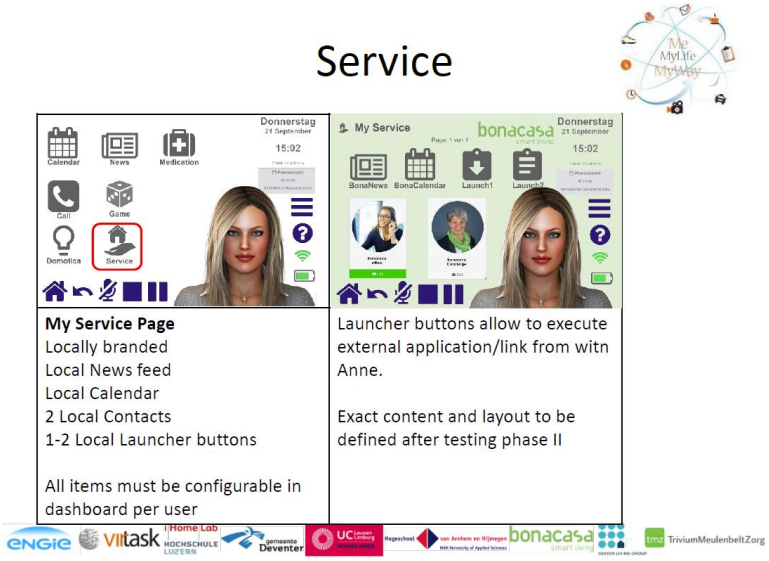

Figure 7: Service Page Functionality for Phase III

3 Business Requirements (D6.3)

3.1 Mission

The consortium of MyLifeMyWay strives to be the missing piece of the puzzle on ageing with autonomy, creating a win-win prospect, increasing the quality of life of the elderly, whilst helping the care organizations (home - and institutional care) cutting off the operational costs effectively. Using innovative solutions in the care domain has a long term social-economic impact.
The MyLifeMyWay project will provide a Personal Virtual Assistant (PA) that will enable large number of silver residents of the European Union to live their life independently for a longer period of time. The PA aims to be easy to use and deliver social, mental and physical impacting features for elderly; helping with remembering and doing small but handy routine daily jobs. PA Anne is able to receive vocally the pre-integrated commandos given by the end-user

3.2 Pains and Gains to solve

- Anne must be suitable for remote care using digital tools
- Anne must give the informal carer a voice and presence in the home of the user, making it possible to care whilst doing other things. Stress release of care givers and give safety to the end user. The end user, the carer are assisted by Anne to do their job easier.
- Anne must be able to help people who have memory problems by reminding them.
- Anne must help preventing loneliness and depression by making connections and has to facilitates easy communication
- Anne must keep people attentive who are forgetful and let them keep their independence and dignity by structuring the day, giving news and reminders and have a personal agenda
- Anne must assist the users doing simple things as knowing what day it is, what the weather is like, the most important news, who's birthday it is, keeps people connected
- Anne must be able to prevents malnutrition and dehydration, by regularly telling people kindly to eat and drink something, and to promote patients compliance for medication
- Anne must stimulate patients to stay active and involved in our society (games, news and favourite radio stations)

3.3 Accessibility of the System

- Anne must be operable without knowledge and understanding of computer equipment, nor are reading skills. Just talking to Anne will do!
- Anne must feel warm and familiar. In order to see her not as a computer, but as a companion.
- Anne must make it possible and pleasant for everyone to use digital tools, including illiterate. She has to be multilingual

3.4 Differentiation against Local and Global Players

In order to compete against local 'island solutions':

- Anne must be a tool that provides several solutions in one.

In order to compete against global players as Amazon, Google, Apple, Samsung the following differentiation is of utmost importance

- The system must work (without updates of content) without a permanent internet connection
- Speech recognition and free speech recognition has to be performed locally
- All data must be stored secured or in a secured server, that is under full control of the associated supporting organization. No linking with other information sources and deep data mining is performed integral scale is allowed. Privacy of the data is very sensitive.
- As differentiation the system has to have a visualized avatar that makes working with the system more natural.
- For the AI-part in these system is on one hand telemetry data, on the other hand the formal/informal carer has to be linked to the system to provide mta data, gathered by knowing the real end user personally
- Anne must connect care givers and the primary end users with a system like Anne, that has benefits for both parties

1.5 Commercialise the project outputs

In order to commercialise the project outputs we must explore the possibilities of all the consortium partners to commercialise the product and use their knowledge of their national markets. We must make market analyses for the countries in which the consortium partners operate (Belgium and Switzerland).

We must gather more information about:

- The care system and the position of home care.
- Product: What is the pain? What are the needs and demands? What about the demographics, politics and economics?
- Price: Who is paying?
- Promotion: Where to start to promote Anne, who to turn to? Who are the main influencers?
- Distribution: What channels can we use for getting the product and the service to the end users?
- We would like to impose on the knowledge and contacts of the AAl as well, if possible.

4 Usability Requirements (D3.2)

For the usability Anne is going to be modelled according to Material Design (see https://material.io/guidelines/). This means that in the future there will be changes to the software to enhance the usability.

In this document the current state of usability requirements of Anne is explained.

For now, the usability requirements can be split into two topics:

- **Interface design** (section 4.1)

  This will explain how the design of the interface makes working with Anne simple and fun.

- **Interaction design** (section 4.2)

  This will explain how the design of the interaction is shaped to prevent confusions and how it

4.1 Interface design

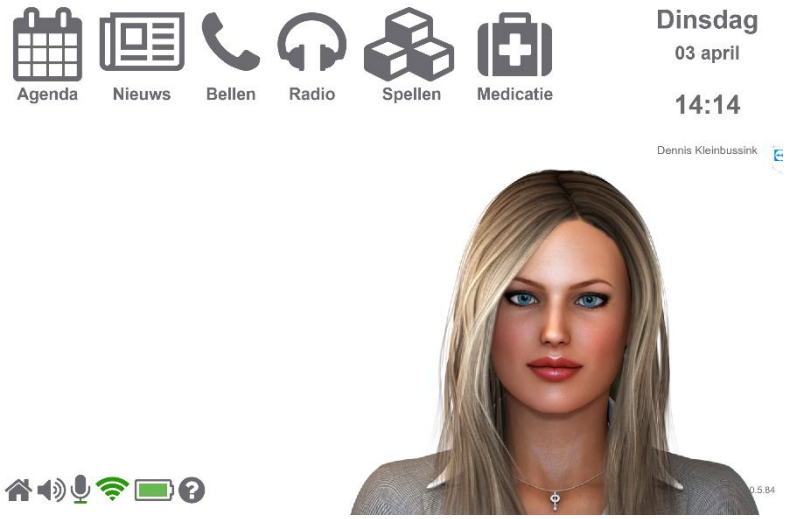

Figure 8: Start Screen Anne

To make sure working with Anne is easy and feels natural the software is built with a recognizable and simple design, see figure 8.

To ensure the recognizable design

- The date and time must always be visible on screen in the upper right corner;

- The following buttons must always be visible in the lower left corner of Anne;

Home Button	Pause Button	Microphone	Wi-Fi Button	Battery	Information
Opens the start screen.	Disables the speech commands.	Shows if Anne is listening to speech commands.	Shows if there is an internet connection.	Shows how full the battery is.	Opens the information screen.

- The Avatar must be always visible in the lower right corner.

Anne is software that provides the user with different functionalities:

- Calendar
- News
- Videocall
- Radio
- Games
- Medication
- Domotica

These functionalities must be visible on the start screen, see Figure 8.

For each functionality must have an icon and title visible. This way literate and illiterate people can work with the software.

When a functionality is opened in the upper right corner an icon and title must be visible. That way the user knows what functionality is active at that moment.

4.2 Interaction design

For the interaction with the software there must be available most time the following two options:

- **Speech commands**

  Anne must be command-based software, this means that the software will only react to predetermined phrases. In the first stage the software may not be able to extract the acceptation of random phrases. Users must know the speech commands to be able to work with the software. In future there should be implemented free text regime speech recognition.

- **Touch commands**

  The software is installed on tablets with touchscreen. It must be possible to use the touchscreen to give Anne commands and navigate through the software. For almost all speech commands there must be a corresponding touch command.

To enhance the usability of the software the following user interaction rules must be followed:

- There must be a set with overall speech commands that can be used throughout the program:
    - Activating the microphone
        - Also possible by touch command
    - Deactivating the microphone
    - Opening the start screen
        - Also possible by touch command
    - Opening an information screen
        - Also possible by touch command
    - Opening another functionality
        - In the start screen also possible by touch command
    - Asking the date
    - Asking the time
- The software always must acknowledge the activation phrase: 'Listen Anne '.
- By opening a functionality Anne must say what functionality is opened.
- Every command must give either a visible or a spoken response.
- After a phrase said by Anne, the microphone must be activated for the user to give a command to the software, for a time that can be determined by the user.
- Every functionality has to have its own information screen.
- The medication configured in the software must be displayed and called out by Anne 10 minutes in advance. After the first time Anne must repeat the medication notification every 10 minutes for 4 hours, or until the medication is confirmed by touching the notification.
- The calendar items configured in the software must be displayed and called out by Anne on the set notification time once. The notification of the calendar item must disappear when the set time for the appointment has passed.
- Medication/calendar/missed call notifications must always be visible in the side bar.
- It doesn't matter in what functionality the user is, if a call comes in there must be a pop up with the current contact calling visible.

5 Security and Privacy Policy (D3.3)

Taking into account all principles and guidelines compiled in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.** of Deliverable D3.3, a set of security and privacy requirements evolve. They have to be followed in the definition of the system architecture. We tried to focus on a set of 11 requirements, giving a reasonable frame for the project MyLifeMyWay and respect the dignity and privacy of all of the MLMW users in an optimal way. This set is shown in table below.

Topic	Requirements
Compliance	The system must be compliant with • the national data protection, privacy and ethical legislation in each participant country • the EU GDPR regulations coming into effect in May 2018
Voluntariness	• All persons taking part as users in the project MLMW must participate with their free will. • They can quit the project without any drawback any time. • They can request, that their stored, non-aggregated personal data can be deleted within a specific time frame on their request completely
Data Sharing	All data recorded and stored in this project • must be kept in the protected project environment. • is not allowed to be sold or used for advertisement purposes Data stored in the personal agenda can be shared by the end users selectively with their supporters.
Lifetime	• All persona data, collected during the project must be deleted after the completion of the project. This is valid for configuration data, telemetry data, questionnaires, interview notes • Aggregated data – not back-traceable to an individual user – can be kept beyond the project end. E.g. project reports, publications etc.

Pseudonymisation	• All data stored in any form must be pseudonymised • No clear text names are stored together with measurement data, questionnaires, telemetry data • The key between data sets and real persons must be stored securely, with access of clear defined authorized personnel
Transmission	• No clear text transmission of data between one and another system component is allowed • All data transmitted from one physical system component to another must utilize a secure transport layer. The applied techniques must be state of the art
Storage	• All data stored in paper form (notes, forms…) containing personal data must be kept in safe area. This means unauthorized access is prohibited in an efficient way. • Electronic stored data must be protected against unauthorized physical and electronic access with suitable technical measures
Access	• Access to the front and backend devices must be protected • An access scheme must be defined for each user group and each data type, to ensure adequate data usage.
Evaluation	• Evaluation of must be done on pseudonymised data only • Evaluation of the data must follow the principle of proportionality
Aggregation	• Usage data (telemetry) and research data (questionnaires, interviews) must not be aggregated for joint evaluation

Table 2: Security and Privacy Requirements

6 Technical Requirements (D3.1)

6.1 Approach to Achieve Suitable Technical Specifications and System Architecture

The technical requirements (functional and non-functional) are derived from all different requirement aspects in this deliverable D2.3.

This is the complete set of requirements, that have to be fulfilled by a suitable systems architecture. The architecture itself is defined and described in deliverable D3.1 in the chapters 6-8.

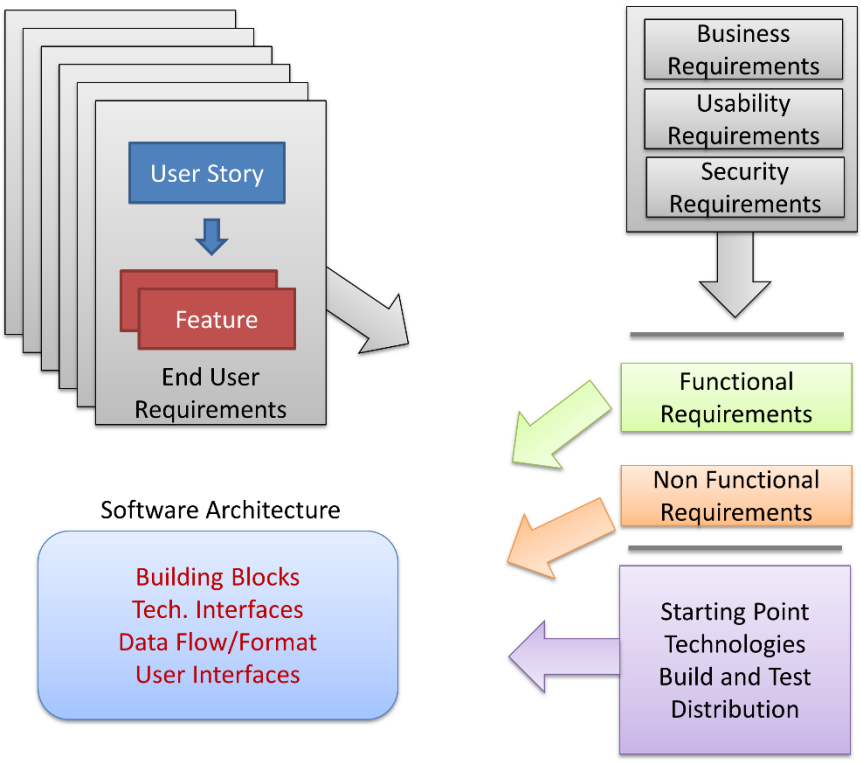

Figure 9 MLMW's building blocks that influence the system architecture.

6.2 Principles and Guidelines

The design of MyLifeMyWay (MLMW) is not only challenging in a technical point of view but also from the organizational perspective. Due to these challenges, all decisions must follow a set of principles, which forms the base criteria for any design choices.

6.2.1 Design boundary condition

- A multinational and interdisciplinary team of researcher and representatives from industry is working on the solution with their highly specialized knowledge. Therefore, a key requirement for the success of the MLMW project is to build the system independently of any specific programming language or technology.

- Short latency times: Less latency increases the acceptancy for the system; hence, it must be taken into account during the whole design process.

6.2.2 Architecture requirements and guiding principles

From the points mentioned in the Chapter 6.2.1 and the overall project targets, the following design principles can be extracted:

- Modularity: the MLMW System must be modular, so that it is possible to sell only a subsystem, which has been shown to be crucial for market success. In Addition, modularity has the advantage to clarify responsibilities between partners.
- Scalability: To guarantee a successful market entry in Europe at the end of the project, the system must be based on highly scalable components. This includes the possibility of simply duplicates key components, without breaking the overall architecture.
- High availability: MLMW is not a safety-of-life system but even though the user acceptancy relays on a stable and fail-safe system. Not only counts to reduce the risk of downtimes rather than to optimize recovery time after a total fail out.
- Future proof: Any work on MLMW system must be done with respect to possible changes, meaning it can be adapted to new market needs. The applied concepts and technologies have to be future oriented and supported by at least one major platform.

6.2.3 Data security and encryption is fundamental

The safety of the data of the MyLifeMyWay users is a fundamental design goal of MyLifeMyWay. Protecting sensitive data is the end goal of almost all IT security measures. Two strong arguments for protecting sensitive data are to avoid identity theft and to protect privacy.

Therefore, authentication, authorization and encryption are fundamental components of the MyLifeMyWay system.

Privacy is Priority

The evolution of Web technologies has increased collection, processing and publication of personal data. Privacy concerns are raised more often as applications built on the Web platform have access to more sensitive data — including location, health and social network information — and users' activity on the Web is ubiquitously tracked.

The privacy of MyLifeMyWay's users is therefore a paramount concern. MyLifeMyWay will not use any of the user's personal data for anything outside the core MyLifeMyWay system use cases – no advertising and no selling of statistical data. The solution design will make sure that every user has only access to his own data and shares only the minimum information needed with other users to enable communication and interaction inside MyLifeMyWay. Other user related information is kept and stored during the project duration for internal analysis and development of collaborative intelligence algorithms. The security aspect is discussed in task T3.4 Security and Privacy policy and documented in the according deliverable D3.3.

The system architecture needs to ensure that a single end-user device or a single end-user will never have access to other data than its own. Furthermore, the system architecture must take care of obfuscating data so that a single entry never can be traced back to a specific end-user or end-user device. This applies for secured data transmission as well as for aggregated data mentioned in the paragraph above.

6.3 Non Functional Requirements

Non-functional requirements, describe attributes of the system or attributes of the system environment. They focus on topics such as performance requirements, throughput, usability, reliability and supportability. These requirements are just as important as the input-output oriented functional requirements. They express a more "static" view that cannot be easily included in the use cases. Typically, non-functional requirements are stated declaratively using expressions such as "The system should have a mean time between failure of 2000 hours", "The Smartbot shall be able to store and retrieve a maximum of 100 weld paths"…

The following non-functional requirements have been identified for MyLifeMyWay:

- Usability requirements are described in the 'D3.2 usability requirements'
- Security requirements are described in the 'D3.3 security and privacy requirements'
- The client device must be able to provide service for one older adult at a time (no multiuser environment supported).
- The system features must consider different local language settings (Netherlands, Belgium, Switzerland)
- The system must be compliant with the access rights for the user group model (end user, carer, supporter, sysadmin)
- The backend system part must be able to handle up to 1000 clients at a time.
- The client system must be reactive and give a response to the user request within 1 second
- The system must provide a telemetry data logging capability, in order to analyse (offline) the user behavior. The data must be uploaded and available on a backend database in a anonymized secured format.
- The system must encrypt / secure all data transmission.
- The client system software must be updated remotely for local user groups and individual devices. Updates must be performed without required user intervention
- The client device must allow remote access. The end user has to give permission for every intervention by a technician
- The system must provide the older adult with the ability to use the functions without continuous internet connection.
- Speech synthesis and recognition must work locally without any internet connection. No cloud solution
- The system must be able to be adapted to different countries and languages. Understanding of local dialects has to be implemented if feasible

- The system must be documented for end users, supporters and system administrators with appropriate user/training manuals
- The system must provide an operation manual for administrators which describes operating the hosted service and its interfaces.
- The client devices must operate with Windows (>=) 10 operating system. The portability to other mobile plattforms is for android OS wished and iOS nice to have.
- The system must be released under a compatible software license.
- The development process is agile. Code must be stored in source versioning system, Bugs and issues must be handled in an issue tracker.
- An online communication channel must be available for the development team

6.4 Functional Requirements, Use Cases and Implementation

The use cases are taken from delivery 2.2 and implemented in a technical way to show the involved system during one scenario. It constitutes the basis for interface definition on the various subsystems. In the following paragraph, Eva is used as an example for an elderly person.

6.4.1 Read relevant News

Service	News
Short description	Eva wants to read/listen news, by using Anne. She wants to have a quick way, without navigating through hundreds of articles, to get the relevant information for her.
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne
Technological actors	Anne Client as user interface, Virtask Backend, arbitrary number of RSS Feeds.
Interaction between actors	**Eva ←→ Anne** • Speech command ("open news") or touch command from Eva to Anne • Confirmation of received command • Display of most relevant article based on her registered RSS feeds (the accuracy of propositions increases with the knowledge earned by data scientists) • Eva can now read the articles by her own or let, with speech command ("read all"/"read this article"), Anne read the articles for her. **Anne ←→ Virtask Backend** • Anne gets configured RSS feeds from Virtask backend for Eva.

	• Virtask backend sends the latest news back to Anne **Virtask Backend ←→ RSS Feeds** • Virtask Backend get latest content of RSS Feed and forwards it to Anne
Notes	The RSS Feeds are provided by third parties like CNN, BBC, …

6.4.2 Make video call

Service	Video call
Short description	Eva wants to call her daughter by using Anne with speech control.
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne. **Lisa**, she is the daughter of Eva and is the first contact person for her.
Technological actors	Anne Client as user interface, Virtask Backend
Interaction between actors	**Eva ←→ Anne** • Speech command ("open call") or touch command from Eva to Anne • Confirmation of received command • Displays all possible contacts with differencing between online contacts (green) and offline contacts (grey) • Now, Eva can call one of the online contacts by speech command or touching on the call button. In our case, Lisa. • Anne initiates a call to Lisa. **Anne ←→ Virtask Backend** • The Virtask backend manages all the online contacts. Whenever an incoming call is received, it is forwarded to the right device/person. **Anne ←→ Lisa** • No matter on what screen Lisa is, she is notified that Eva is calling her. • Lisa can now decide to accept or decline the call. • Lisa accepts the call and gets a video stream in the center of her current screen.
Notes	

6.4.3 Agenda

Service	Agenda
Short description	Eva wants to have control over her daily life and does not want to miss any appointment.
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne
Technological actors	Anne Client as user interface, Virtask Backend
Interaction between actors	**Eva ←→ Anne** • Speech command ("open calendar") or touch command from Eva to Anne • Confirmation of received command • Eva can now see her calendar with the next upcoming appointments and reminders **Anne ←→ Virtask Backend** • Anne get configured agenda items from Virtask backend for Eva. • Virtask backend sends the latest data back to Anne
Notes	

6.4.4 Medication

Service	Medication
Short description	Eva wants to plan her activities throughout the day and wants to know which medication she has to take when
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne
Technological actors	Anne Client as user interface, Virtask Backend
Interaction between actors	**Eva ←→ Anne** • Speech command ("open medications") or touch command from Eva to Anne • Confirmation of received command • Eva can now see her personal medication plan **Anne ←→ Virtask Backend** • Anne get configured medication items from Virtask backend for Eva.

	• Virtask backend sends the latest data back to Anne
Notes	

6.4.5 Listen to the radio

Service	Radio
Short description	Eva wants to listen to the radio
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne
Technological actors	Anne Client as user interface, Virtask Backend
Interaction between actors	**Eva ←→ Anne** • Speech command ("open radio") or touch command from Eva to Anne • Confirmation of received command • Eva is presented a list of radio channels • Eva selects a channel • Radio starts playing **Anne ←→ Virtask Backend** • Anne gets configured radio station URLs • Virtask backend sends the latest data back to Anne
Notes	

6.4.6 Play a game

Service	Games
Short description	Eva wants to pass some time by playing a game
Human actors	**Eva**, end user, owns a SurfacePro with Anne installed on it. She is trained in using Anne
Technological actors	Anne Client as user interface
Interaction between actors	**Eva ←→ Anne** • Speech command ("open games") or touch command from Eva to Anne • Confirmation of received command • Eva is presented a list of games

	• Eva selects a game • Game starts
Notes	

6.4.7 Switching Living Room Lamp

Service	Home automation
Short description	Eva wants to switch on / off the living room light, by using Anne. She needs visual and audible confirmation of the actions taken by Anne.
Human actors	**Eva**, end user, living in a service flat that has home automation. She is trained in using Anne
Technological actors	Anne Client as user interface, free@home installation up and running, HomeAutomationGateway (HAG) connected to free@home and Anne client device
Interaction between actors	**Eva ←→ Anne** • Speech commands or touch commands from Eva to Anne • Confirmation of received commands • Display of actual configuration and statuses • Information on performed actions (success, no change, …) **Anne ←→ HAG** • Invoke web socket • Send/receive configuration • Send/receive status • Send/receive result of requested action • Send/receive commands **HAG ←→ f@h** • Invoke connection • Send/receive configuration • Send/receive status • Send/receive commands
Notes	

6.4.8 Receive Front Door Call

Service	Home automation
Short description	Lisa is at the front door of Eva's flat and wants to visit her. She presses the doorbell button. Eva is notified by Anne, and opens the home automation screen. Eva sees Lisa via the video door communication on the Anne tablet and greets her with "hallo". Now, Eva opens the door, using Anne.
Human actors	**Eva**, end user, living in a service flat that has home automation. She is trained in using Anne **Lisa**, she is the daughter of Eva and wants to visit her. She is outside of the flat of Eva and wants to enter
Technological actors	**Anne** system running on a tablet, connected to the backend server, running on the entry page with muted microphone **Home automation gateway (HAG)** started up and connected to Anne and free@home **free@home** system up and running, connected to HAG and ABB-Welcome **ABB-Welcome** with local LCD touch panel, door communication system with camera and audio connection. Door open relay and doorbell button are up and running
Interaction between actors	**Anne ←→ HAG** • HAG sends over established web socket notification that the front door bell is pressed (ring event). This invokes step 7 (domotica page, highlight doorbell notification and audio confirmation ("I switch now to the door automation window"). This gives the control over the microphone and mute Anne's TTS /ASR and give ok event to HAG. HAG takes over the screen and brings itself in front. • HAG closes the specific window after termination of door operation. Gives back the authority over the microphone to Anne. Gives also status of the current configuration and the result of the door operation back to Anne. • HAG sends current configuration and status to Anne after termination of door operation (in all cases) **HAG ←→ f@h** • SIP session invocation and termination • Transmit touch events on special window to f@h. (door open, mute microphone) • Get status and configuration information from f@h **Eva ←→Anne/HAG**

	• Anne sends notification about doorbell event to Eva
	• Anne sends missed doorbell event in case of timeout and no action
	• Eva can directly open door on domotica page by pressing or speech command
	• HAG displays SIP audio video session in separate window after ring event
	• HAG offers in separate audio video session window the following touch (touch only) buttons for Eva:
	  ○ abort
	  ○ mute doorbell tone
	  ○ open door
	  ○ speak to door post
	Eva ←→Lisa
	• Speaking to each other via video – audio session
	Lisa ←→Welcome Home
	• Pressing button on door bell – invoking ring-event
	• Speaking to video cam with audio and video stream after invocation of stream
	• Opens the door after activation of door relay

Notes	

6.5 Hardware Requirements

The tablet hardware requirements for Anne including all the applications (including Home Automation Gateway (HAG)) are:

Function	Requirement	Comment
Main functions		
Screen diameter	10 - 13 inch	
RAM-memory	4 GB	
Total storage capacity	64 – 128 GB	
Computer type	Tablet / laptop	laptop is not the preferable choice because keyboard is not necessary.
Screen		

Screen quality	Full HD (1080p)	
Screen resolution	1280 x 800 pixels 1920 x 1080 pixels	
Screen technology	Touchscreen	
Screen type	IPS panel	
Light sensor	not necessary	Will be turned off
Processor		
Processor type	Intel Atom of Celeron or bigger	
Processor cores	Quad core	
clocking	Minimal 1300 MHz	
Memory		
Memory (RAM)	Minimal 2 GB	
Store type	SDD/HDD minimal 64 GB	
Store capacity expansion	not necessary	
Video		
Video processor	No specific requirements	
Connectivity		
Wireless connection	Bluetooth & WIFI	
USB connection	USB, USB-A, USB-B	
HDMI	Not necessary	
Sound		
Loudspeaker(s)	Integrated	Perfect quality
Headphone connection	Yes	3,5 inch jack (Bluetooth)
Microphone intern	Yes, preference: screen integrated	Perfect quality
Microphone connection point	Yes	3,5 inch jack
Camera		
Camera	Yes, screen integrated	
Camera quality	Minimal 2 megapixels	
Camera second (rear)	Not necessary	
Keyboard		

Keyboard	Virtual - QERTY	AZERTY (Belgian)
Keyboard (external)	Optional	More expensive types standard
Power (Battery)		
battery capacity	Minimal 6000 mAh	
Battery life	4 hours use	
Power adaptor	Minimal 4 Amp	
Wireless charging	Strong preference	If present
Operating System		
Operating System	Windows 10 (pro)	Pro version if present
Others		
GPS	Not necessary	
Weight	Not more than 1,2 kg	
Color	No preference	No bright colors

HARDWARE OPTIONS

Function	Requirement	Comment
External loudspeakers	convenient, practical loud-speakers with minimal wir-ing	Still, perform selection and testing
External microphone	convenient, practical mi-crophone	Still, perform selection and testing
External keyboard	Keyboard is not necessary	