



D3.2

User Acceptance Report

Editor(s)	IBIMA	Project name	TV-based ASSistive Integrated Service to Support European Adults living with Dementia
Author(s)	Elena Durá Fermin Mayoral	Acronym	TV-AssistDem
		Website	www.tvassistdem-aal.eu
		Deliverable	D3.2, User Acceptance Report
Reviewer(s)		Nature/type	Report
		Dissemination Level	Public
		Delivery Date	30/09/2020
		Final Delivery	

Document History

Version	Date	Type of editing	Editorial
0.1	30/09/2020		Restricted

Deliverable Summary

D2.2 – User acceptance: This report will collate the results of in-depth interviews with users, carers and healthcare professionals to explore their satisfaction with and perception of the platform and the study as a whole. This version covers the assessment at 6M. It is not the final acceptance evaluation of the system that will be carried out in the 12 m visit.

Table of Contents

1.	LIST OF ABBREVIATIONS	4
2.	INTRODUCTION	5
3.	METHODOLOGY	5
3.1	PROCEDURE	5
3.2	SETTINGS	5
3.3	PARTICIPANTS	5
3.4	INSTRUMENTS	6
	3.4.1 <i>System Usability Scale (SUS)</i>	6
	3.4.2 <i>Semi-Structured Interview</i>	6
4.	RESULTS	7
4.1	SUS ASSESSMENT RESULTS	7
4.2	QUESTIONNAIRE INSIGHTS	9
4.3	STUDY ACCEPTANCE	11
5.	CONCLUSIONS	12
6.	BIBLIOGRAPHY	13

1. LIST OF ABBREVIATIONS

DOW	Description of work
TV	Television
MCI	Mild Cognitive Impairment
AD	Alzheimer's Disease
SUS	System Usability Scale
PwMCI/MD	People with Mild Cognitive Impairment/Mild Dementia
SD	Standard Deviation

2. INTRODUCTION

In the context of technology development, usability and acceptability testing explore the extent to which a particular system can be used to achieve specific objectives with effectiveness, efficiency and satisfaction of the target group of users in a specified context.

3. METHODOLOGY

3.1 Procedure

Following the TV-AssistDem Description of Work (DOW), TV-AssistDem involves active user-centered participation and feed-back. The assessment was performed at 6 months with an invited fraction of the study sample (5%), randomly selected after their experience of using TV-AssistDem, via completion of the System Usability Scale (SUS) and a semi-structured interview. The clinical team of each pilot site collected the information for the user acceptance assessment through some face-to-face meetings.

Please note that this report gathers information of the first 6 months of the TV-Assistdem use. In the final evaluation at 12th months, we hope to collect the opinions of the users regarding the pilot organization, whether they received enough support or if they were fully informed about the pilot aims, etc.

3.2 Settings

The Spanish Health Research Institute of Malaga (IBIMA) and the Romanian NGO Home Care Association (Îngrijiri La Domiciliu) were the recruiting centers of this project.

3.3 Participants

The study sample was randomly selected from participants who had used the TV-Assisted application for 6 months. Out of the 101 candidates 72 were selected to answer the SUS, 32 from Spain and 40 from Romania.

For the semi-structured interview, in which user's feedback was collected regarding the overall perception of TV-AssistDem, 5% of the Spanish intervention group's sample was invited to participate.

3.4 Instruments

The User Acceptance was analyzed by an assessment of the user satisfaction via completion of the System Usability Scale and a semi-structured interview.

3.4.1 System Usability Scale (SUS)

The SUS, created by John Brooke in 1986, is the most frequently used questionnaire to measure usability of a wide variety of products and services, including hardware, software, mobile devices and websites. This instrument consists of ten-item Likert scale with 5 options to choose from (Strongly Agree to Strongly Disagree), with odd-numbered items worded positively and even-numbered items worded negatively (1). The following are the questions of the scale:

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

3.4.2 Semi-Structured Interview

The pre-designed questions were the second instrument used to conduct the user acceptance assessment. They addressed the satisfaction within the TV-AssistDem functionalities, focusing on how intuitive users found the application and how the users interface design responded to their abilities and preferences.

The pre-defined questions are presented below. In some cases, the interviewers detail these questions or ask other specific ones depending on the answers provided. This action is done to improve the feedback received and complement it.

1. Could you mention three positive characteristics of the system?
2. Could you mention three negative characteristics of the system?
3. What would you improve from the system?
4. What problems have you encountered with the system?
5. Is there any functionality you would like to have or would like to add?
6. Is there any functionality you don't use or consider irrelevant?
7. Would you recommend the system to other people?
8. Would you like to keep the system after the study?

4. RESULTS

4.1 SUS assessment results

After collecting all the answers to the SUS in each pilot site, the calculation of the SUS score for each user and the overall one by site was obtained. The methodology to calculate the scores was based on the SUS methodology defined by Brooke (1,2), as follows:

- Each item's score contribution will range from 1 to 5. A rating of "1" indicates "strong disagreement", whereas a rating of "5" corresponds with "strong agreement"
- If a participant fails to respond to an item, assign it a 3 (the centre of the rating scale).
- Odd-numbered questions are all in a positive tone. For items 1,3,5,7, and 9 the score contribution is the scale position minus 1.
- Even-numbered questions are all in a negative tone. For items 2,4,6,8 and 10, the contribution is 5 minus the scale position.
- Multiply the sum of the scores by 2.5 to obtain the overall SUS score.

The usability performance is calculated based on three different aspects: effectiveness, efficiency, and overall ease of use. SUS scores range from 0 to 100, with an average score of 68. A SUS score above a 68 would be considered above average and anything below 68 is below average. Table 1 presents the different levels of SUS score and their grades. For each analysis, the 95% confidence intervals around the average of the SUS score is provided.

The SUS score could be interpreted in different ways: percentiles, grads, adjectives, acceptability, and promoters and detractors (3, 4). For the User Acceptance analysis

presented on this report we have analyzed the SUS score in terms of percentiles, what's "acceptable" or "not acceptable", and promoted and detractors referring to the likelihood to recommend the application.

90-100	A
80-89	C
70-79	D
60-69	E
Less than 60	F

Table 1. SUS score grades

Table 2 presents the different SUS scores for each country. Usability assessment in Spain was performed with 32 participants who completed the second visit at 6 months. The average SUS score was 68.83 ± 14.70 (average +/- standard deviation or standard error). With a 95% of confidence the population mean is between 35.0 and 92.5.

For their part, usability assessment in Romania was performed with 40 participants who completed the second visit at 6 months. The average SUS score was 17.19 ± 4.88 (average +/- standard deviation or standard error). With a 95% of confidence the population mean is between 7.5 and 27.5.

	Score	SD	Range
Total	40.13	27.84	7.5-92.5
Spain	68.83	14.70	35.0-92.5
Romania	17.19	4.88	7.5-27.5

Table 2. Summary of SUS average scores by country

The average SUS score of the TV-AssistDem application is below average (68 points), graded with a F by PWMCI/MD participants with a mean SUS score of 40.13.

The TV-AssistDem SUS scores can be converted into a percentile rank. Considering that a score of 68 represents that 50% percentile, the percentile of the TV-AssistDem, combining SUS average score from the two countries (**40.13 ± 27.84**), is ranked below the 50% percentile.

Regarding the acceptability, a score above 70 (above our average of 68) is considered as an acceptable application and below 50 is considered as an unacceptable application. If the SUS score is ranged between 50 to 70 it is considered an “marginally acceptable” application. TV-AssistDem is ranked as a marginally acceptable application when we look at the SUS scores across Spain (68.83) , and not acceptable across Romania (17.19).

Finally, in terms of likelihood to recommend the application, the TV-AssistDem application is ranked in the range of “Detractors” (SUS score between 0 and 60 approx...), even though specifically in the case of Spain the SUS score is under the range of “Passives”.

4.2 Questionnaire insights

This section presents the insights of the questionnaire designed for the occasion in which users' feedback is collected regarding the overall perception of TV-AssistDem. 5% of the Spanish intervention group's sample was invited to participate, randomly selected after using TV-AssistDem for 6 months.



A user during the semi-structured home interview

After completing the questionnaire in Spain, we identified the following insights that could be used to improve the application. The following are the insights collected from PwMCI/MD.

1. Memory Games the most used functionally, as reported by 100% of the participants. Participants found the games very useful and fun. They performed the exercises on a daily basis by themselves or with the assistance of their caregivers. While many found the functionality cognitively stimulating, others enjoyed it for leisure. The design and layout of the games, the availability of different levels, and the great variety were strong assets found.
2. Participants appreciated the Calendar and Reminders to plan daily life activities, take medication, attend healthcare appointments, organize social meetings, etc. However, they reported difficulties when adding or planning Reminders for medication. Though participants interacted with the calendar often, caregivers engaged more fully with this functionality, planning health and social events for their loved ones.
3. My Health is not reported as usable. They prefer to see their health data and medications in their medical reports.
4. Participants suggested Health Measure could be more user friendly. Nobody reported having registered their health measures (blood pressure, pulse, weight, sugar level). They didn't find this functionality usable because they were used to registering this information in paper.
5. Videocall was found to be a very useful feature for being in touch with their family members and friends. However, it was not widely used because some of them use their mobile phones to have contact with their relatives, and others reported some connectivity issues.
6. They found the Healthcare Education functionality very interesting as it enabled visualization of videos of physical activity at home and health information, especially during Covid-19 confinement, to promote indoor physical activity.
7. General Information was reported as one of the least used functionalities.
8. Regarding the setup of the system, some people think that they would like to have other functionalities such as radio, cooking channel or a film streaming platform.
9. Concerning other issues, users got confused when receiving an incoming call because no screen would show the incoming call message and echo was also

reported. Some users experienced barriers related to the use of the remote controls.

10. All users would recommend Tv-Assistdem. They think that it could help people in their situation, specifically the Reminders and Memory games functionalities

4.3 Study acceptance

Researchers explored during the semi-structured interview participants overall experience with study participation. Most users reported experiencing a satisfactory experience and established a therapeutic trust relationship with the clinical team. The clinical screening and follow-up assessments were found important by caregivers who benefited from an in-depth evaluation of the clinical status and decline of their family member. Follow-up calls for medication adherence served as reported by some participants, as an intervention against social isolation, and they felt more accompanied by the clinical team during their therapeutic process than by other health services. Participants were also recommended and referred to other services for cognitive impairment and dementia and were grateful for this. Moreover, during the COVID-19 pandemic, participants found comfort and support from the clinical team.



Spanish project interview room

5. CONCLUSIONS

After completing the user acceptance analysis, it is clear that Tv-AssistDem must continue to progress in order to improve its user experience. However, we consider that the results obtained should be taken with caution due to the large differences found between the two countries. While in Spain the SUS score is close to the average, in Romania the data is really low.

In Spain, TV-AssistDem had a good acceptance in terms of covering PwMCI/MD needs. Usability problems, as reported by participants, are produced in most of the cases due to the unfamiliarity and difficulty in using the technology.

Regarding the overall perception of the project, we will collect the participants reported on organization, support, etc. We hope that this feedback gives us the relevant information to continue working on the improvement of the TV-AssistDem.

6. BIBLIOGRAPHY

1. Peres SC, Pham T, Phillips R. Validation of the system usability scale (sus): Sus in the wild. Proc Hum Factors Ergon Soc. 2013;(1):192–6.
2. Lewis JR, Sauro J. The factor structure of the system usability scale. Lect Notes Comput Sci (including Subser Lect Notes Artif Intell Lect Notes Bioinformatics). 2009;5619 LNCS:94–103.
3. Sauro, J. (5). ways to interpret a SUS score. Available at: <https://measuringu.com/interpret-sus-score/>
4. Bangor, Aaron, Philip Kortum, and James Miller. "Determining what individual SUS scores mean: Adding an adjective rating scale." Journal of usability studies 4.3 (2009): 114-123.

AAL



PROGRAMME