



PELOSHA

PERSONALIZABLE SERVICES FOR SUPPORTING HEALTHY AGEING

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Execution and evaluation plan Pilot Test Guidelines - protocol and Instruction

Deliverable D4.1

Lead authors

Laëtitia Gosetto¹, Frédéric Ehrler¹, Mikołaj Buchwald²

¹ Hôpitaux Universitaires de Genève (HUG)

² Poznań Supercomputing and Networking Center (PSNC)

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EXECUTIVE SUMMARY

This document describes the pilot test of the PELOSHA platform. The goal of the pilot test is to validate the acceptance of the platform by users (seniors, informal caregivers, care home and nurses), validate its functioning. The success of the project should be measured on several layers. The goal of the pilot test is to verify to what extent the PELOSHA platform influences: (1) the increase in the general quality of users life and work, (2) the improvement in the health-related quality of users life, and (3) the growth in the physical fitness of users.

The document includes plans for empirical testing of the Alpha and Beta versions of the platform among end-users in three countries: Switzerland, Poland, and Belgium. Several qualitative and quantitative research methods will be combined in order to answer the research questions.

This is a running document and will be updated whenever the first mid-fidelity system is ready for end-users to control settings, then a heuristic evaluation is planned to gain insight into the usability of the PELOSHA system.

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1 INTRODUCTION

To maximize the chance of success of any product, it is vital to evaluate the product with a wide range of potential end-users before its release on the market. Many different tests can be performed to this end such as usability tests that provides a rich and large amount of input for improvements of the design of the system's User Interface (UI) and input devices.

1.1 RESEARCH QUESTIONS AND GOALS

It is crucial to evaluate the product with a wide range of potential end-users before it will be released on the market. In this pilot test, researchers are going to find answers to the following questions:

1. Has the seniors' overall quality of life increased because of using the PELOSHA platform?
2. Has the home nurses' work comfort increased because of using the PELOSHA platform?
3. Has the informal caregivers' quality of life increased because of using the PELOSHA platform?
4. Has the seniors' health improved because of using the PELOSHA platform?
5. Has the seniors' physical fitness improved because of using the PELOSHA platform?
6. Is the Pelosha platform highly useful for users? (How useful is each module?)

The additional aim of the pilot test is also to gather all feedback and information from the end-users. It can be used to improve the PELOSHA platform and provide an even better product. It is crucial to test the usage and usefulness of individual modules as well as the whole platform. The pilot test should be conducted, taking into account each module's functional independence and in conjunction with other functions.

1.2 PELOSHA PILOT EVALUATION

The PELOSHA pilot evaluation with end users will be conducted in Switzerland, Poland and Belgium. The PELOSHA platform includes several functionalities. Among the expected features, older people will be equipped with a connected wearable band that sends information to the system. The band will collect health information like pulse and the number of calories burned actively. Also, some sensors will have additional equipment installed in the house to monitor parameters such as air quality or sleep monitoring. These sensors will be integrated through a special box (hub). Seniors, informal caregivers, and home nurses can have secure access to all this information via a mobile application. Seniors will have a tablet with the app, and caregivers will install the app on their smartphones. Seniors will also be able to use: weighing scale, pulsometer, and thermometer.

The pilot test is divided into three main stages:

1. Alpha test stage
2. Beta 1.0 test stage
3. Beta 1.1 test stage

The goal of the first two stages – (1) Alpha test stage and (2) Beta 1.0 test stage – is to prepare user interface of the best quality and the PELOSHA platform as a whole before the final test: (3) Beta 1.1 test stage. With this approach, it will be more efficient to conduct the quality of life, work, fitness, and health

tests during the last stage – (3) Beta 1.1 stage when the potential inconvenience of the user interface will be reduced and eventual PELOSHA platform's technical issues will be resolved.

The ALPHA test stage is mostly a usability test. It will be performed using the PELOSHA platform's interface mockup. The BETA 1.0 test stage and the BETA 1.1 test stage are based on tests, observation, interviews, and analysis of usage data. The BETA 1.0 test stage will last for 1 week and include between 30 and 45 participants. The BETA 1.1 test stage will last for 4 weeks and include between 90 and 135 participants. For both BETA stages, users will have to use the system at their homes and use the PELOSHA applications every day.

2 METHODS

In this section methods used to conduct testing of the PELOSHA system will be described.

2.1 PARTICIPANTS

Alpha testing (interface testing)

36 participants will be recruited for the Alpha testing, that is:

- In Berlingen or Geneva (Switzerland): 6 caregivers, 6 seniors.
- In Poznan (Poland): 6 caregivers, 6 seniors.
- In Hamont (Belgium): 6 caregivers, 6 seniors.

Note: Seniors and caregivers don't have to be paired.

Beta testing 1.0 (interface testing and platform bugs)

48 participants will be recruited for Beta testing (1.0 stage), that is:

- In Geneva (Switzerland): 6 caregivers, 6 seniors.
- In Berlingen (Switzerland): 6 caregivers, 6 seniors.
- In Poznan (Poland): 6 caregivers, 6 seniors.
- In Hamont (Belgium): 6 caregivers, 6 seniors (care home).

Note: It's important to have both senior and caregiver as participants because your system intends to improve information sharing between seniors and their informal caregivers as well as home nurse. Seniors and caregivers have to be paired.

Beta testing 1.1 (impact on life and healthy of the participants, interface testing is a minor concern here)

128 participants will be recruited for Beta testing (1.1 stage), that is:

- In Geneva (Switzerland): 16 caregivers, 16 seniors.
- In Berlingen (Switzerland): 16 caregivers, 16 seniors.
- In Poznan (Poland): 16 caregivers, 16 seniors.
- In Hamont (Belgium): 16 caregivers, 16 seniors (care home).

Note: It's recommended that the participants on this stage are not familiar with technological solutions similar to PELOSHA, because we would like to test, in an experiment-like manner the impact the system will have on their daily functioning.

2.2 EXPERIMENTERS/INTERVIEWERS

System tests will be prepared and organized by experimenters in each end-user country (Switzerland, Belgium and Poland).

Partners will ensure that the technology for supporting organizing and performing of the interviews will be available (e.g., Skype, email, phone etc.). The interviews, if need (e.g., due to epidemic situation) and, if possible, can be performed remotely (online).

Investigators will be present during installation the PELOSHA system in the house of the older people. They will also help informal caregivers and nurses to install the app in their smartphone. Investigators will explain the concept of the system, as well as each the functionality installed and what is possible to activate in the app.

2.3 PLATFORM TESTING & EXPERIMENTAL TASKS

2.3.1 EXPERIMENTAL SESSIONS

For the Alpha testing, participants will have to:

- Respond to demographic questions, and questions about senior's health care habits;
- Perform some tasks in the mock-up;
- Only for caregivers: respond to questions about caregivers' work;
- Perform some tasks in the mockup (first contact with system tasks, advanced tasks, clarity of language, quality of translation).

For the Beta testing:

Assumption: Participants use the system every day during the session time.

- At the end of the stage time:
 - Investigators ask questions to the participants:
 - Investigators have a grid of questions to ask to the senior, informal caregivers and/or home nurses.
 - These questions concern the usability of the system and of each functionality.
- Participants will have to complete relevant UX tests and questionnaires.
- Investigators come to uninstall the system.

2.4 LOCATION & EQUIPMENT

2.4.1 LOCATION

Alpha test will take place in an office or in the home of the participant. Beta tests will take place in the home of the senior.

The most important site for Beta tests is care home in Hamont, Belgium, because it is the closest to the group to which PELOSHA is intended to be used.

2.4.2 EQUIPMENT

2.4.2.1 *For Alpha test:*

- Mockup of the app (in tablets for seniors and in smartphones for home nurses)
- Audio recorder
- A script – scenario with the procedure for experimenters ([appendix A](#))
- Scenario with the procedure for participants ([appendix B](#))
- Demographic questions ([appendix D](#))
- An informed consent form (Appendix C)
- List of the tasks for the mockups ([appendix G](#))
- Questions about caregivers work ([appendix E](#))
- Question about caregivers work ([appendix F](#))

2.4.2.2 *For Beta test:*

- System (we will install the system with sensors and system gateways in seniors' home), depending on the setup it will/may comprise of:
 - A box with air quality sensors and a raspberry pi/a tablet with WI-FI (Internet Connection),
 - connected smart-band,
 - other environmental and/or electric measuring devices.
- Application for the caregivers and/or home nurses installed on their smartphone
- Audio recorder
- Scenario with the procedure for participants ([appendix B](#))
- Demographic questions ([appendix D](#))
- An informed consent form (Appendix C)
- A guideline for the semi-structured interview ([Appendix H](#))
- Questionnaires about assessment of the usefulness of each functionality/feature ([appendix J](#))
- SUS ([appendix I](#))
- For beta test 1.1. :
 - WHOQOL-BREF ([appendix O](#))
 - WHOQOL-OLD ([appendix P](#))
 - SF-36 ([appendix Q](#))
 - Short Physical Performance Battery (SPPB) ([appendix R](#))
 - Caregivers Burden Inventory (CBI) ([appendix T](#))
 - Home nurse questions ([appendix S](#))

2.5 MEASUREMENTS

The above-mentioned research questions will be answered by collecting the data with different measurement instruments and with different data collection modes. We will measure the following aspect of interacting with the PELOSHA System.

2.5.1 SUCCESSFUL FUNCTIONING OF THE PELOSHA SYSTEM

For the Alpha testing:

- Number of errors/inconsistencies identified by participants in the mock-up
- Number of interaction problem encountered by participants during the test

For the Beta testing:

- Number of bugs reported during the use of the system
- Number of time participants will ask investigators for help (calling helpdesk, etc.)

2.5.2 USABILITY OF THE PELOSHA SYSTEM AND INTERFACE

For Alpha and Beta testing

System Usability Scale (SUS) created by John Brook (1996):

This scale measures perceived usability with 10 items. This scale permit to know if the system is easy to use depending on the user (see [Appendix I](#)).

Only for the Beta testing:

System Usability Scale (SUS) created by John Brook (1996):

This scale measures perceived usability with 10 items. This scale permit to know if the system is easy to use depending on the user (see [Appendix I](#)).

Questionnaires about their assessment of the usefulness of each functionality

Participants have to indicate for each functionality on a scale of one to five if this functionality was useful. 1 being not at all useful and 5 being very much useful. (see [appendix J](#))

Observation of using the Pelosha platform for the first time

Researchers should observe users when they use the Pelosha application for the first time. Every time users ask for help – the researcher should answer questions, explain how to use that feature, and make a note about this specific problem. The moderator should allow users to move freely around the application observing them and taking notes. If the user does not use some features, they should be asked to do so. For example: "Please go to the temperature measurement details screen and tell me what do you see on it." (see [appendix K](#))

Researcher observation

The researcher should ask a senior to use the Pelosha application as usual. The researcher should allow users to move freely around the app, watching them, and taking notes. If the user does not use some

features, they should be asked to do so. For example: "Please go to the temperature measurement details screen and tell me how do you use it." ([appendix L](#))

Measurements presentation

The researcher should ask seniors if – from their experience – the Pelosha showed them correct values, or maybe they noticed some mistakes? ([appendix M](#))

Data Report

Report of the frequency of use for each functionality, when the functionality was open and the duration of using it. (see [appendix N](#))

2.5.3 ACCEPTANCE OF THE PELOSHA SYSTEM

For the Alpha testing:

- Observation if participants can do the task.
- Appreciation by the participant of the system.
 - With questions in the debrief

For the Beta testing:

- Observation if participants report positive appreciation and usability in the semi-directive interview.
- Investigators can also have access to a monitoring of the system, they can know when the participant has opened the app and which functionality he consulted. These measure permit to know if users frequently use the system and what kind of functionality. Indeed, this measure will be more accurate. Participants may over- or underestimate their frequency of use of features. This measure is also less expensive for participants than asking them to record their use of the functionality in a diary each time.
- Satisfaction of the PELOSHA System: Experimenter asks to participants if they are satisfied by the system. In the final interview experimenter will ask to the participants if they have pleasure to use this system, if they will want to use after when the system will be marketed and if they will advise to their relatives.

2.5.4 HEALTH IMPROVEMENT WITH THE PELOSHA SYSTEM

For the beta testing 1.1:

To test if the PELOSHA System improves the health of seniors and the life quality for seniors and their informal caregivers, we use some questionnaire before the use of our system and after one month of use.

Life quality test

We can use the The World Health Organization Quality of Life Bref for informal caregivers (WHOQOL-BREF) (Whoqol Group, 1998) ([appendix O](#)), is the short version of a questionnaire developed by the World Health Organization to assess the quality of life. We can also use the Caregivers Burden Inventory (Novak et Guest, 1989) with informal caregivers before the use of the system and after one month of use. ([appendix T](#))

We can use the World Health Organization Quality of Life for older people (WHOQOL-OLD) (Power, Quinn, & Schmidt, 2005) before the use of the system and after one month of use. ([appendix P](#)).

Health quality test

We can use the 36-Item Short Form Survey Instrument (SF-36) (Ware, 2000) ([appendix Q](#)) to evaluate the health quality of seniors.

2.5.5 PHYSICAL FITNESS IMPROVEMENT WITH THE PELOSHA SYSTEM

To test if the PELOSHA System improve the physical fitness condition of senior, we use the Short Physical Performance Battery (SPPB) developed by Guralnik (1994) ([appendix R](#)) before the use of our system and after one month of use.

2.5.6 WORK CONFORT IMPROVEMENT WITH THE PELOSHA SYSTEM

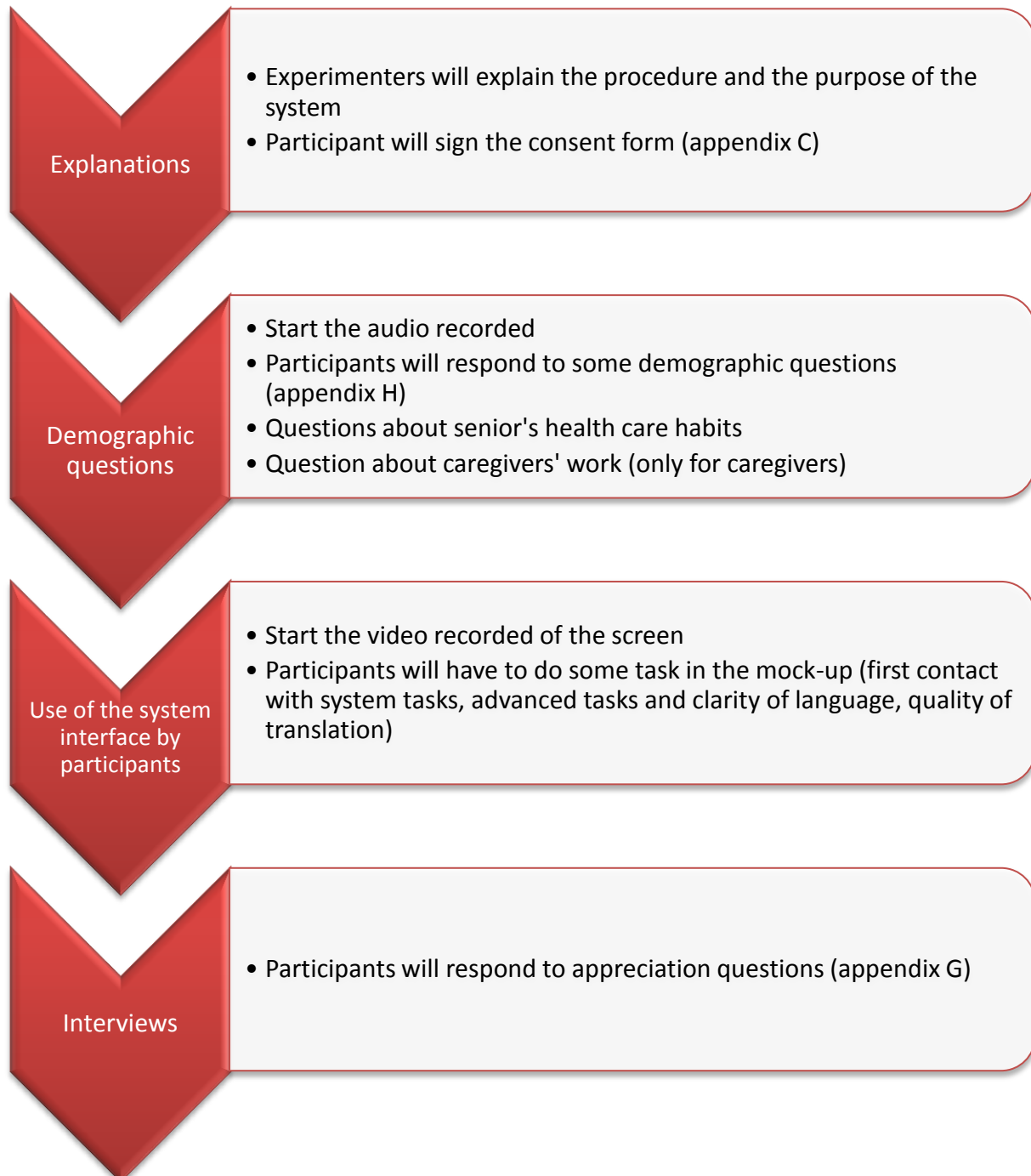
To test if the PELOSHA System improve the work comfort of home nurses, we ask some question about their work before the use of the system and after one month of use. (appendix S)



2.6 PROCEDURE FOR THE EXPERIMENTAL SESSIONS

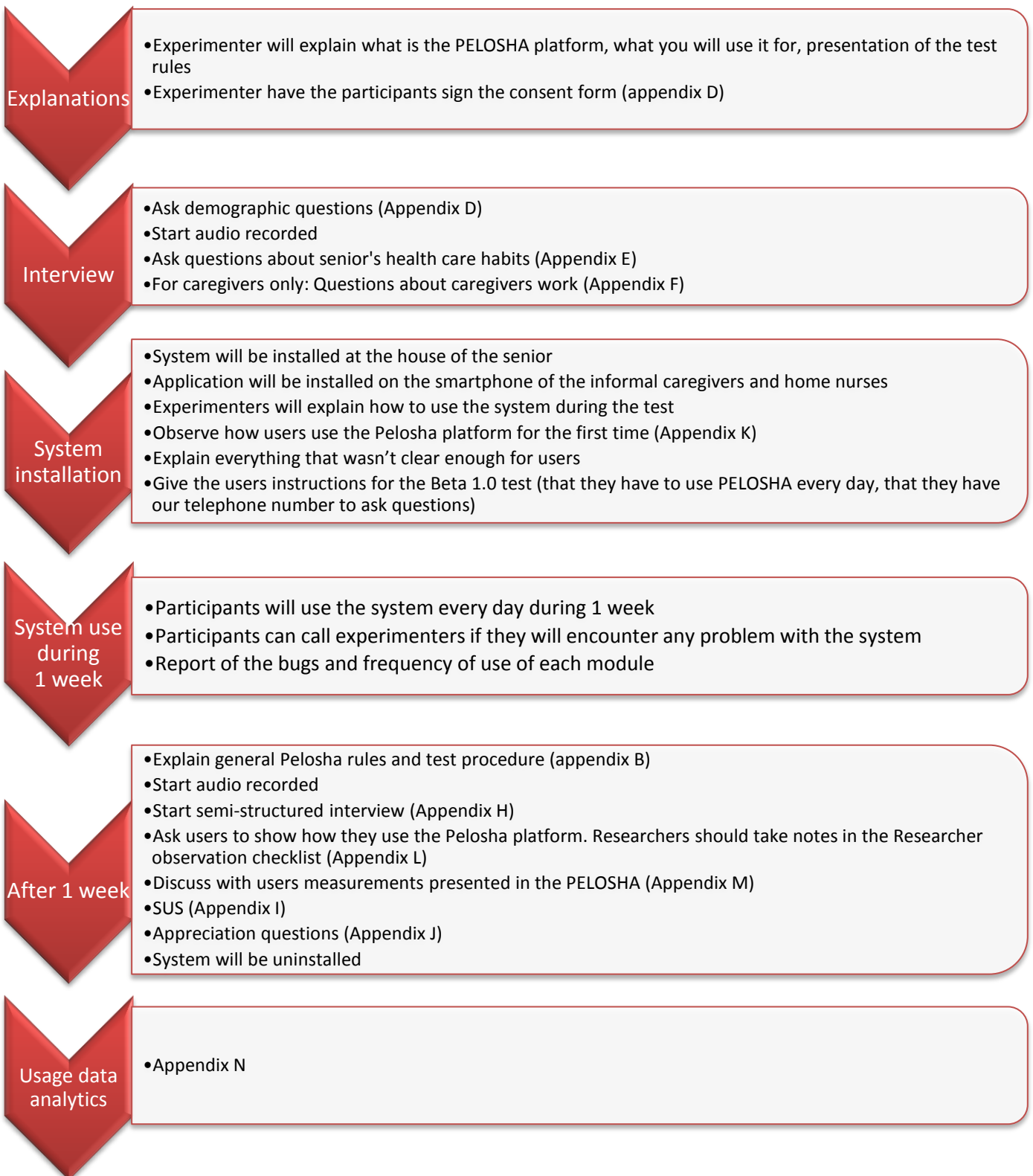
2.6.1 PROCEDURE FOR THE ALPHA VERSION TESTING

Alpha tests (with 18 caregivers, 18 seniors)



2.6.2 PROCEDURE FOR THE BETA VERSION TESTING

Beta test 1.0 (24 caregivers and 24 seniors; 12 people per testing site)



Beta test 1.1

Main tests during Beta testing 1.1 follow the same test scheme as for Beta test 1.0 (above) but there will be more participants (48 older people paired with 48 informal caregivers or home nurses, and 15 seniors in the care home paired with 15 caregivers) have to use the system for 1 month.

Table 1. General overview of particular pilot test stages

Study		Beta 1.0		Beta 1.0		Beta 1.1
Date		2020		2021		2021
The main phase duration (per site/partner)		1 h		1 week		4 weeks
Type of test		Usability tests		Observation and semi-structured evaluation		Observation and semi-structured evaluation
Nr. Pps.		36		48		128
Duration per participant		1 hour		1 week		4 weeks
Method (in the order of implementation)	PRE TEST	<ol style="list-style-type: none"> 1. Ask demographic questions 2. Start usability test 3. Experimenter report 	REDESIGN, PRE TEST	<ol style="list-style-type: none"> 1. Install system and explanation of the system 2. Use the system by participants 3. Uninstall the system and interview 4. System data. 5. Experimenter report. 	REDESIGN, PRE TEST	<ol style="list-style-type: none"> 1. Install system and explanation of the system 2. Evaluation of life quality, health quality, physical fitness and work comfort 3. Use the system by participants 4. Interview, Evaluation of life quality, health quality, physical fitness and work comfort and uninstall the system 5. System data. 6. Experimenter report.
Tasks		Do some tasks in the mockup of the system interface		Use system. Open the app every day.		Use system. Open the app every day.
Measurements		<ul style="list-style-type: none"> – Interviews – Usability test – Questions about senior's health care habits – Questions about caregivers work 		<ul style="list-style-type: none"> – Interviews, observations – Usability test – SUS – Questionnaire about useful of each functionality – Problems encountered 		<ul style="list-style-type: none"> – Interviews, observations – Usability test – SUS, WHOQOL, SF-36, Short Physical Performance Battery (SPPB), Caregiver Burden Inventory (CBI) and home nurse questions – Questionnaire about useful of each functionality – Problems encountered

3 DATA & ANALYSIS

3.1 DATA

All data from different sources should be merged in order to make proper analysis and interpretation. All data collected (audio and visual recordings and transcripts of the interviews) will be anonymized via a coding system. All personally identifiable data will be deleted from our files and archived on one of the institutional computers for the analysis (in one computer for each partner), access to which is protected by a password, not later than one week after the date of the interview. Additionally, for backup purposes, all data will be stored in a secure resource in PSNC's data center.

This data will include:

- A report from experimenters with demographic answers: a SPSS document or MS Excel document in which the data of the participants can be filled in. Either with the answers to the demographic questionnaire and the ID number of the participants.
- A report from experimenters on the analysis of interviews. The interviews should rather be analyzed and translated by the end-user sites due to language barriers. Relevant reports about the usability, usefulness, acceptance of the PELOSHA system, can be summarized and translated into English. Relevant and remarkable citations/comments can be gathered under a theme. This report will be filled in a MS Excel document. Experimenters fill for each research questions the citations with the ID number of the participants, category name and an interpretation of the citation. For example:

Acceptance of the PELOSHA System			
Citation	ID Number	Category name	Interpretation
"I liked the interface, especially the avatars were very nice, and they really made me feel good."	IC3	Design	Appreciate avatar

- Data from the SUS, questionnaire about useful of each functionality, WHOQOL, SF-36, Physical fitness test, work comfort and the UX Curves in a MS Excel document.
- The audio recording of the semi-structured interview.
- (For Alpha test.) The video recording of the screen of the tablet or smartphone during the usability test

- A report in a MS Excel document with the information of the data system. This report will include bugs, frequency of use for each functionality by each participant, when the functionality was open and the duration of use. (see [Appendix N](#))

3.2 ANALYSIS

With these data, we will analyse research questions. Final report will be prepared as a MS Word document which will include the following information:

- Evolution of the number of connections per day for each functionality
- Average usage time for each functionality
- Average indication of the opening time of each functionality
- Number of errors reported by the system for each functionality
- Number of errors reported by the users for each functionality
- Type of errors reported by the user classified by frequency for each functionality and for the system as a whole.
- Usability problems reported by the user classified by frequency for each functionality and for the system as a whole.
- Acceptance problems reported by the user classified by frequency for each functionality and for the system as a whole.
- Usefulness problems reported by the user classified by frequency for each functionality and for the system as a whole.
- Positive appreciation for usability, acceptance and usefulness reported by the user classified by frequency for each functionality and for the system as a whole.
- Average of each questionnaire by the type of population (seniors, informal caregivers and home nurses) and for all users

4 DOCUMENTS/MATERIALS TO BE PREPARED

The following materials should be prepared for the pilot test and are included in the appendix.

User group		Document name	Appendix	Alpha	Beta 1.0	Beta 1.1
professional and informal caregivers	seniors	Scenario with the procedure for experimenters	A	-	-	-
professional and informal caregivers	seniors	Scenario with the procedure for participants	B	Main test	Step 1, Step 2	Step 1, Step 2, Step 3, Step 5
professional and informal caregivers	seniors	Sign consent form	C	Main test	Step 1	Step 1
professional and informal caregivers	seniors	Demographic questions	D	Main test	Step 1	Step 1
professional and informal caregivers	seniors	Questions about senior's health care habits	E	Main test	Step 1	-
professional and informal caregivers	-	Questions about caregivers work	F	Main test	Step 1	-
professional and informal caregivers	seniors	Mockup usability questions	G	Main test	-	-
professional and informal caregivers	seniors	Semi-structured interview	H	-	Step 2	Step 3
professional and informal caregivers	seniors	SUS	I	-	Step 2	Step 3
professional and informal caregivers	seniors	Appreciation questions	J	-	Step 2	Step 3
professional and informal caregivers	seniors	Observation of using the Pelosha platform for the first time	K	-	Step 1	Step 2

User group		Document name	Appendix	Alpha	Beta 1.0	Beta 1.1
professional and informal caregivers	seniors	Researcher observation checklist	L	-	Step 2	Step 3
professional and informal caregivers	seniors	Measurements presentation	M	-	Step 2	Step 3
professional and informal caregivers	seniors	Analytical data to measure	N	-	Step 3	Step 4
professional and informal caregivers	-	WHOQOL-BREF	O	-	-	Step 1, Step 5
-	senior	WHOQOL-OLD	P	-	-	Step 1, Step 5
-	senior	SF-36	Q	-	-	Step 1, Step 5
-	senior	Short Physical Performance Battery (SPPB)	R	-	-	Step 1, Step 5
home nurse	-	Home nurse questions	S	-	-	Step 1, Step 5
Informal caregivers	-	Caregiver Burden Inventory (CBI)	T	-	-	Step 1, Step 5
-	-	Summary Description of Test Stages	U	-	-	-

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6 APPENDIX

6.1 APPENDIX A. SCENARIO WITH THE PROCEDURE FOR EXPERIMENTERS

6.1.1 ALPHA TEST – MAIN TEST

1. Sign consent form ([Appendix C](#)).
2. Explain general Pelosha rules and test procedure ([Appendix B](#))
3. Ask demographic questions ([Appendix D](#))
4. Start audio recorded
5. Ask questions about senior's health care habits ([Appendix E](#))
6. For caregivers only: Questions about caregivers work ([Appendix F](#))
7. Start a mockup usability test ([appendix G](#))

6.1.2 BETA 1.0 TEST

6.1.2.1 Step 1: Introduction

1. Sign consent form ([appendix C](#)).
2. Explain general Pelosha rules and test procedure ([appendix B](#))
3. Ask demographic questions ([Appendix D](#))
4. Start audio recorded
5. Ask questions about senior's health care habits ([Appendix E](#))
6. For caregivers only: Questions about caregivers work ([Appendix F](#))
7. Observe how users use the Pelosha platform for the first time ([Appendix K](#))
8. Explain everything that wasn't clear enough for users
9. Give the users instructions for the Beta 1.0 test (that they have to use PELOSHA every day, that they have our telephone number to ask questions)
10. Set up meetings with the participants (after 2-3 days) during which they will show us how they use PELOSHA and what are causes them most trouble when interacting with the system.

6.1.2.2 Step 2: Observation

After 2 / 3 days (or the last day before uninstalling the platform):

1. Explain general Pelosha rules and test procedure ([appendix B](#))
2. Start audio recorded
3. Start semi-structured interview ([Appendix H](#))
4. Ask users to show how they use the Pelosha platform. Researchers should take notes in the Researcher observation checklist ([Appendix L](#))
5. Discuss with users measurements presented in the PELOSHA ([Appendix M](#))
6. SUS ([Appendix I](#))

7. Appreciation questions ([Appendix J](#))

6.1.2.3 Step 3: Usage Data Analytics

[Appendix N](#)

6.1.3 BETA 1.1 TEST

6.1.3.1 Step 1: Baseline

6.1.3.1.1 Seniors - life quality test, health test, and a fitness test

1. Sign consent form ([Appendix C](#)).
2. Explain general Pelosha rules and test procedure ([appendix B](#))
3. Ask demographic questions ([Appendix D](#))
4. Life quality test ([Appendix P](#))
5. Health quality test ([Appendix Q](#))
6. Short Physical Performance Battery (SPPB) ([Appendix R](#))

6.1.3.1.2 Caregivers - work comfort test

1. Sign consent form ([appendix C](#)).
2. Explain general Pelosha rules and test procedure ([appendix B](#))
3. Ask demographic questions ([Appendix D](#))
4. Work comfort test ([Appendix O](#)), ([Appendix S](#))
5. Caregivers Burden Inventory (Appendix T)

6.1.3.2 Step 2: Introduction/Installation

6.1.3.2.1 Seniors – Group with an introduction to the test only (**no observations**)

1. The signing of documents related to hardware installation
2. Explain general Pelosha rules and test procedure (Appendix B)
3. Set up meetings with the participants during which they will show us how they use PELOSHA and what are causes them most trouble when interacting with the system(In total, 5 users per country should be scheduled for observations.)

6.1.3.2.2 Seniors – Group with an introduction to the test and **observations**

1. The signing of documents related to hardware installation
2. Explain general Pelosha rules and test procedure (Appendix B)
3. Start audio recorded
4. Observe how users use the Pelosha platform for the first time (Appendix K)
5. Explain everything that wasn't clear enough for users

6. Set up meetings with the participants during which they will show us how they use PELOSHA and what are causes them most trouble when interacting with the system (In total 5 users per country should be scheduled for observations.)

6.1.3.2.3 Caregivers - Introduction to the test (no observations)

1. The signing of documents related to hardware installation
2. Explain general Pelosha rules and test procedure (Appendix B)
3. Set up meetings with the participants during which they will show us how they use PELOSHA and what are causes them most trouble when interacting with the system (In total, 5 users per country should be scheduled for observations.)

6.1.3.2.4 Caregivers - Observation

1. The signing of documents related to hardware installation
2. Explain general Pelosha rules and test procedure (appendix B)
3. Start audio recorded
4. Observe how users use the Pelosha platform for the first time (Appendix K)
5. Explain everything that wasn't clear enough for users
6. Set up meetings with the participants during which they will show us how they use PELOSHA and what are causes them most trouble when interacting with the system (In total, 5 users per country should be scheduled for observations.)

6.1.3.3 Step 3 Observation

6.1.3.3.1 Meetings with seniors

1. Start audio recorded
2. Explain general Pelosha rules and test procedure ([appendix B](#))
3. Start semi-structured interview ([Appendix H](#))
4. Ask users to show how they use the Pelosha platform. Researchers should take notes in the Researcher observation checklist ([Appendix L](#))
5. Discuss with users measurements presented in the PELOSHA ([Appendix M](#))
6. SUS (Appendix I)
7. Questionnaire for appreciation of each functionality by users (Appendix J)

6.1.3.3.2 Meetings with caregivers

1. Start audio recorded
2. Explain general Pelosha rules and test procedure ([appendix B](#))
3. Start semi-structured interview ([Appendix H](#))
4. Ask users to show how they use the Pelosha platform. Researchers should take notes in the Researcher observation checklist ([Appendix L](#))

5. SUS (Appendix I)
6. Questionnaire for appreciation of each functionality by users (Appendix J)

6.1.3.4 Step 4 Analytics

Appendix N

6.1.3.5 Step 5 Final research

6.1.3.5.1 Seniors - life quality test, health test, and a fitness test

1. Explain general Pelosha rules and test procedure ([appendix B](#))
2. Life quality test ([Appendix P](#))
3. Health quality test ([Appendix Q](#))
4. Short Physical Performance Battery (SPPB) ([Appendix R](#))

6.1.3.5.2 Caregivers - work comfort test

1. Explain general Pelosha rules and test procedure ([appendix B](#))
2. Work comfort test (Appendix O), (Appendix S)
3. Caregivers Burden Inventory (Appendix T)

6.2 APPENDIX B. SCENARIO WITH THE PROCEDURE FOR PARTICIPANTS

6.2.1 ALPHA TEST – MAIN TEST

6.2.1.1.1 Seniors

Thank you for meeting with us. Today's meeting will take about one and a half an hour. We would like to record our conversations if you don't mind. Its easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I am going to ask you - how you are taking care of your health every day. Finally, I will show you a mockup of the application and ask you to do some work. I'll tell you more about it soon. If you have any questions, you can ask at any time.

6.2.1.1.2 Caregivers

Thank you for meeting with us. Today's meeting will take about one and a half an hour. We would like to record our conversations if you don't mind. Its easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I am going to ask you how – from your experience - seniors take care of their health. We would also like to know how do you organize your work with seniors. Finally, I will show you a mockup of the application and ask you to do some work. I'll tell you more about it soon. If you have any questions, you can ask at any time.

6.2.2 BETA 1.0 TEST

6.2.2.1 Step 1: Introduction

6.2.2.1.1 Seniors

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. Its easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I am going to ask you - how do you take care of your health every day. I will also give you a tablet with an application that helps you take care of your health. We will observe how you use it for the first time and help you if there is something unclear. Finally, we will ask you to use this app every day for the whole week. At the end of this research, we would like you to show us how you use the Pelosha application. If you have any questions, you can ask at any time.

6.2.2.1.2 Caregivers

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. Its easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I am going to ask you how – from your experience - seniors take care of their health. We would also like to know how do you organize your work with seniors. Then we will help you install the Pelosha application that helps you manage taking care of seniors' health. We will observe how you use it for the first time and help you if there is something unclear. Finally, we will ask you to use this app every day for the whole week. At the end of this research, we would like you to show us how you use the Pelosha application. If you have any questions, you can ask at any time.

6.2.2.2 Step 2: Observation

After 2 / 3 days (or the last day before uninstalling the platform):

6.2.2.2.1 Seniors

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some questions about the Pelosha application. Then, I am going to ask you to show me how you were using the Pelosha. I would also like to know what do you think about the quality of the values measurements. Finally, I'll ask you to answer some general questions about the application. If you have any questions, you can ask at any time.

6.2.2.2.2 Caregivers

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some questions about the Pelosha application. Then, I am going to ask you to show me how you were using the Pelosha. Finally, I'll ask you to answer some general questions about the application. If you have any questions, you can ask at any time.

6.2.3 BETA 1.1 TEST

6.2.3.1 Step 1: Baseline

6.2.3.1.1 Seniors

Thank you for meeting with us. Today's meeting will take about 2 hours.

First, I'll ask you some demographic questions. Then, I am going to ask you questions about the quality of your life and health. Finally, I'll ask you to do some easy exercise. The goal of this test is to find out whether the Pelosha app increases your health or not so that we will ask you to do the same exercises and test after one month of using the Pelosha. If you have any questions, you can ask at any time.

6.2.3.1.2 Caregivers

Thank you for meeting with us. Today's meeting will take about 1 hour.

First, I'll ask you some demographic questions. Then, I am going to ask you questions about the quality of your work. The goal of this test is to find out whether the Pelosha app helps you manage your job or not so that we will ask you to answer the same questions after one month of using the Pelosha. If you have any questions, you can ask at any time.

6.2.3.2 Step 2: Introduction/Installation

6.2.3.2.1 Seniors – Group with an introduction to the test only (no observations)

Thank you for meeting with us. Today we are going to give you the Pelosha application and the tablet. We will explain to you how it works and how we'd like you to use it for the whole month. We'd also like to ask you when you will have time to meet us and show us how you use this application. If you have any questions, you can ask at any time.

6.2.3.2.2 Seniors – Group with an introduction to the test and with observations

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I will also give you a tablet with an application that helps you take care of your health. We will observe how you use it for the first time and help you if there is something unclear. Finally, we will ask you to use this app every day for the whole month. We'd also like to ask you when you will have time to meet us and show us how you use this application. If you have any questions, you can ask at any time.

6.2.3.2.3 CaregiverS - Introduction to the test (no observations)

Thank you for meeting with us. Today we are going to help you install the Pelosha application. We will explain to you how it works and how we'd like you to use it for the whole month. We'd also like to ask you when you will have time to meet us and show us how do you use this application. If you have any questions, you can ask at any time.

6.2.3.2.4 Caregivers – Observation

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some demographic questions. After that, I will help you install the Pelosha application that helps you manage taking care of seniors' health. We will observe how you use it for the first time and help you if there is something unclear. Finally, we will ask you to use this app every day for the whole month. We'd also like to ask you when you will have time to meet us and show us how you do use this application. If you have any questions, you can ask at any time.

6.2.3.3 Step 3 Observation

6.2.3.3.1 Seniors

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some questions about the Pelosha application. Then, I am going to ask you to show me how you were using the Pelosha. I would also like to know what do you think about the quality of the values measurements. Finally, I'll ask you to answer some general questions about the application. If you have any questions, you can ask at any time.

6.2.3.3.2 Caregivers

Thank you for meeting with us. Today's meeting will take about 2 hours. We would like to record our conversations if you don't mind. It's easier to listen to it later than take notes during the speaking.

First, I'll ask you some questions about the Pelosha application. Then, I am going to ask you to show me how you were using the Pelosha. Finally, I'll ask you to answer some general questions about the application. If you have any questions, you can ask at any time.

6.2.3.4 Step 5 Final research

6.2.3.4.1 Seniors

Thank you for meeting with us. Today's meeting will take about 2 hours.

I am going to ask you the same questions about the quality of your life and health that a month ago. I'll also ask you to do some easy exercise. We are very curious whether the Pelosha app increased your health or not after one month of using it. If you have any questions, you can ask at any time.

6.2.3.4.2 Caregivers

Thank you for meeting with us. Today's meeting will take about 1 hour.

I am going to ask you the same questions about the quality of your work. We are very curious whether the Pelosha app helped you manage your job or after one month of using it. If you have any questions, you can ask at any time.

6.3 APPENDIX C. INFORMED CONSENT FORM

6.3.1 FOR ALPHA TEST

Research PELOSHA Personalizable Services for Supporting Healthy Ageing	
Persons responsible for the research project:	[experimenter name] [experimenter email]

Project Title: PELOSHA

Dear Sir/Madam,

You are invited to take part in the development of the PELOSHA system.

Before you make your agreement to participate, it is important that you read the following carefully.

If you have any questions or comments, please do not hesitate to let us know.

1. Purpose of the project

The PELOSHA project aims to develop a system enabling older people to remain autonomous and independent at home. This test will allow us to improve our system, to see if it is easy to use and if any problems are encountered when using it.

2. Procedure

You will first be asked to give your consent, by signing this consent form, to participate in the study. We will ask you some demographic questions, after you will have to complete some tasks in the mockup of the system. Finally, we will ask you some questions about your impressions of the system, and you will have to complete an evaluation scale.

3. Voluntary participation

Your participation in this test is voluntary. You can stop the test at any time without giving an explanation. If you realize that you do not want your data to be used after all, you have one week to register. During this period we will be able to delete them.

4. Disadvantages and possible risks for participants

You are free not to answer any questions that are inconvenient.

Participation in this test does not represent any risk.

5. Benefits

There is no advantage to participating in this test except the precious help you will bring us by sharing your impressions.

6. Anonymity and data protection

The data collected (audio and visual recordings and transcripts of the interviews) will be anonymized via a coding system. All personally identifiable data will be deleted from our files and archived on one of the institutional computers, access to which is protected by a password, not later than one week after the date of the interview. After this period, we will no longer be able to destroy your data if you so request.

These anonymized data may then be used directly for internal reports, dissemination of the project, publications in journals and conferences, and/or more indirectly by being reused for future research.

This consent form will be kept for 5 years in a locked drawer accessible only to the members of the project.

7. Access to research results for participants

If you are interested in the search results, you can contact [name of the experimenter] from [month]. Due to the anonymization of the data no individual results can be transmitted.

8. Contacts

For more information about your rights as a participant, in case you have any questions or if you are not satisfied with the way we have proceeded, you are free to contact the following people: [name and e-mail address of the experimenter]

9. Consent to participate in research

On the basis of the above information, I confirm my agreement to participate in the "PELOSHA" research, and I authorize:

-
- The use of the data for scientific purposes and the publication of the results of the research in scientific journals or books, on the understanding that the data will remain anonymous and that no information will be given on my identity. ☐

-
- The use of the data for educational purposes (training courses and seminars for students or professionals subject to professional secrecy). ☐

-
- Audio recording of the interview ☐

And confirm: ☐

- Have read this document carefully and have had the opportunity to ask for clarifications. I therefore confirm that I have understood all the contents and agree to participate voluntarily in this test.

-
- Have been informed of the possibility of withdrawing at any time without giving reasons, if necessary, to request the destruction of my data within ☐
-

one week after the interview.

This consent does not relieve the research organizers of their responsibilities. I retain all my rights under the law.

First name Last name

Signature

Date

RESEARCHER'S COMMITMENT

The information on this consent form and the answers I gave to the participant accurately describe the project.

I agree to conduct this study in accordance with ethical standards for research projects involving human participants and in accordance with the Guidelines for Integrity in Scientific Research.

I undertake that the research participant will receive a copy of this consent form.

First Name Last Name

Signature

Date

6.3.2 FOR BETA TEST

Research PELOSHA Personalizable Services for Supporting Healthy Ageing	
<u>Persons responsible for the research project:</u>	[experimenter name] [experimenter email]

Project Title: PELOSHA

Dear Sir, dear Madam,

You are invited to take part in the development of the PELOSHA system.

Before you make your agreement to participate, it is important that you read the following carefully.

If you have any questions or comments, please do not hesitate to let us know.

1. Purpose of the project

The PELOSHA project aims to develop a system enabling older people to remain autonomous and independent at home. This test will allow us to improve our system, to see if it is easy to use and if any problems are encountered when using it.

2. Procedure

You will first be asked to give your consent, by signing this consent form, to participate in the study. We will then install our system in the elderly person's home and an application on the smartphone of the caregiver and/or the home nurse. You will then have to use the system for 1 week (or 1 month). We will then do an interview at the participant's home. The interview will then be recorded on an audio support. If this is not convenient for you, we will simply take notes during the exchange. You will be invited to answer questions about your use of the system. The questions will focus on your impressions of the system. Of course, you will be free not to answer certain questions. The interviews will take place in the home of the elderly person. Finally, the experimenter will uninstall the system.

3. Voluntary participation

Your participation in this test is voluntary. You can stop the test at any time without giving an explanation. If you realize that you do not want your data to be used after all, you have one week to register. During this period we will be able to delete them.

4. Disadvantages and possible risks for participants

You are free not to answer any questions that are inconvenient.

Participation in this test does not represent any risk.

5. Benefits

There is no advantage to participating in this test except the precious help you will bring us by sharing your impressions.

6. Anonymity and data protection

The data collected (audio and visual recordings and transcripts of the interviews) will be anonymized via a coding system. All personally identifiable data will be deleted from our files and archived on one of the institutional computers, access to which is protected by a password, not later than one week after the date of the interview. After this period, we will no longer be able to destroy your data if you so request.

These anonymized data may then be used directly for internal reports, dissemination of the project, publications in journals and conferences, and/or more indirectly by being reused for future research.

This consent form will be kept for 5 years in a locked drawer accessible only to the members of the project.

7. Access to research results for participants

If you are interested in the search results, you can contact [name of the experimenter] from [month]. Due to the anonymization of the data no individual results can be transmitted.

8. Contacts

For more information about your rights as a participant, in case you have any questions or if you are not satisfied with the way we have proceeded, you are free to contact the following people: [name and e-mail address of the experimenter]

9. Consent to participate in research

On the basis of the above information, I confirm my agreement to participate in the "PELOSHA" research, and I authorize:

-
- The use of the data for scientific purposes and the publication of the results of the research in scientific journals or books, on the understanding that the data will remain anonymous and that no information will be given on my identity. ☐

-
- The use of the data for educational purposes (training courses and seminars for students or professionals subject to professional secrecy). ☐

-
- Audio recording of the interview ☐

And confirm: ☐

- Have read this document carefully and have had the opportunity to ask for clarifications. I therefore confirm that I have understood all the contents and agree to participate voluntarily in this test.
-



-
- Have been informed of the possibility of withdrawing at any time without giving reasons, if necessary, to request the destruction of my data within one week after the interview. ☐

This consent does not relieve the research organizers of their responsibilities. I retain all my rights under the law.

First name Last name

Signature

Date

RESEARCHER'S COMMITMENT

The information on this consent form and the answers I gave to the participant accurately describe the project.

I agree to conduct this study in accordance with ethical standards for research projects involving human participants and in accordance with the Guidelines for Integrity in Scientific Research.

I undertake that the research participant will receive a copy of this consent form.

First Name Last Name

Signature

Date

6.4 APPENDIX D. DEMOGRAPHICS QUESTIONS

6.4.1 DEMOGRAPHICS QUESTIONS FOR SENIOR

1. General

1.1 Age: _____

1.2 Place of residence: _____

1.3 Gender

☐ Male

☐ Female

1.4 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

☐ No schooling completed

☐ Nursery school to 8th grade

☐ Some high school, no diploma

☐ High school graduate, diploma or the equivalent

2. Independency

2.1 Are you living independently?

☐ yes

☐ no

2.2 Do you have someone who takes care of you?

☐ Yes

☐ no

If yes who is it? nurse/children/wife?



2.3 Do you benefit from any home services? Like homes nurses

If yes

☐ For what kind of services ?

☐ Are you satisfied with them ?

2.4 Do you have a system/medical solution helping you remain independent? Do you have any experience with such a system? Maybe by testing it? By system we mean a telealarm (a button on a necklace or a bracelet or other to call emergencies), a system in a mobile phone like an application, some elements in the home that indicate your presence or the activation of a device (like smoke detection, detection of the opening of the doors, windows etc.)

3. Technology use

3.1 Experiences with other technology

☐ I do have a cell phone

☐ I do have a smartphone

☐ I do have a tablet

☐ I do have computer

☐ I do have a smart watch/ smartband

3.2 Frequency of use



- ☐ Everyday
- ☐ Once in a week
- ☐ Once a month
- ☐ I have tried a Computer/smartphone one or two times, don't regularly use it
- ☐ No experience (skip 3.3 and 3.4)

3.3 Perceived skill level

- ☐ Not very skilled
- ☐ Not skilled
- ☐ Neutral
- ☐ Skilled
- ☐ Very skilled

3.4 Which applications do you use? ex. uber, Facebook, airbnb, fitness app, calendar?

6.4.2 DEMOGRAPHIC'S QUESTIONS FOR HOME NURSE AND INFORMAL CAREGIVER

1. General

Identification number:

1.1 Age: _____

1.2 For informal Caregivers:

Senior he helps (father, mother, partner etc.): _____

1.2.1. Senior's age: _____



1.2.2. For what kind of problem?: _____

1.2.3. Does senior benefit home nurse services? _____

1.2.4. What kind of help the nurse is giving? _____

1.2.5. Does senior benefit other helps? Like home services, remote alarm

1.3 For Home nurses

1.3.1. What kind of help you give to seniors? _____

1.3.2. What kind of help benefit the seniors generally? _____

1.4 Gender

☐ Male

☐ Female

1.5 What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.

☐ No schooling completed

☐ Nursery school to 8th grade

☐ Some high school, no diploma

☐ High school graduate, diploma or the equivalent

2. Technology use

2.1 Experiences with other technology

☐ I do have a cell phone

- ☐ I do have a smartphone
- ☐ I do have a tablet
- ☐ I do have computer
- ☐ I do have a smart watch/ smartband

2.2 Frequency of using

- ☐ Everyday
- ☐ Once in a week
- ☐ Once a month
- ☐ I have tried a Computer/smartphone one or two times, don't regularly use it
- ☐ No experience (skip 3.3 and 3.4)

2.3 Perceived skill level

- ☐ Not very skilled
- ☐ Not skilled
- ☐ Neutral
- ☐ Skilled
- ☐ Very skilled

2.4 Which applications do you use? ex. uber, Facebook, airbnb, fitness app, calendar?

6.5 APPENDIX E. QUESTIONS ABOUT SENIORS' HEALTH CARE HABITS

6.5.1.1.1 SENIORS

Health satisfaction

1. How do you generally assess your health? Are you satisfied with it?
2. Would you like to improve it or keep it as it is?
 - a. If you want to keep it - what you need to do to achieve this?
 - b. If you want to improve it - what you need to do to achieve this?
3. Have you done any of these things so far? With what effect?
4. What were the most challenging for you? Why?

Physical activity

5. What kind of physical activity do you like the most?
6. What do you like most about it? Why?
7. Do you have the opportunity to do it regularly? (Why not?)
8. How often should you do it to be healthy and happy?

Taking measurements

9. Do you take measurements such as blood pressure, pulse, body temperature, bodyweight?
 - a. How often?
 - b. Why?
 - c. What other measurements should be taken?

Sleeping

10. Do you sleep well? (Why not?)
11. What would you like to improve in your sleeping?

Support from family and caregivers

12. How often do you visit your doctor or home nurse?
13. What is the most valuable in support from a doctor or home nurse?
14. How often do you stay in contact with your family?
15. Do you think it is enough, or should these meetings be more often or less often?
16. What kind of support do you have from your family when it comes to taking care of your health?

6.5.1.1.2 FROM CAREGIVERS PERSPECTIVE

Seniors health satisfaction

1. Are your close senior satisfied with his/her health?
2. Would he/she like to improve it or keep it as it is?
 - a. If he/she wants to keep it - what he/she do to achieve this?
 - b. If he/she wants to improve it - what he/she do to achieve this?
3. What is the most challenging for him/her? Why?

Physical activity

4. What kind of physical activity does he/she like the most? Why?
5. Does he/she have the opportunity to do it regularly? (Why not?)
6. How often should he/she do it to be healthy and happy?

Taking measurements

7. Does he/she take measurements such as blood pressure, pulse, body temperature, bodyweight?
 - a. How often?
 - b. Why?
 - c. What should other measurements be taken?

Sleeping

8. Does he/she sleep well? (Why not?)

Support from family and caregivers

9. How often does he/she visit your doctor or home nurse? Is it enough?

6.6 APPENDIX F. QUESTIONS ABOUT CAREGIVERS WORK

1. How many seniors are you taking care of now?
2. What is the most challenging while working with seniors?
3. How do you encourage them to be physically active?
4. How do you encourage them to control their health regularly?
5. What kind of help seniors need the most often?
6. How do you organize your work?

6.7 APPENDIX G. MOCKUP TEST SCENARIO

6.7.1 INTRODUCTION FOR A MOCKUP TEST

We are going to present to you a mockup of the Pelosha application. Mock-up is only a simulation of a real app. It looks as it works, but it doesn't. Everything is fake there. It is a tool to imagine how it could work in reality. Most of the things won't work. When you click on something, it will show you something different than you are expecting to see.

Please try to pretend that it is a real application.

You need to be aware that we are not testing you. You can't make any mistakes here. If you will not be able to complete some tasks, it means that the app simulation has some kind of errors. We want you to tell us about it so that we could make the real application better.

6.7.2 TASKS FOR SENIORS

Initially, researchers should allow users to go through all the stages freely, on their own, asking seniors to comment aloud on what they are doing and thinking. If during this, users skip any of the steps, the researcher should ask them for specific tasks, so that they will try to complete all the following:

Imagine that your caregiver recommended this application to you as the best for taking care of your health.

1. Start using this application
2. Create your account
3. Choose modules that you'd like to use. Tell me why have you chose them.
4. Dashboard:
 - 4.1. What is this screen for? How can you use it?
5. Add a new blood pressure measurement.

Imagine that you've been using this app for a while now. Show me what are the values of different modules and explain how it has changed during the month. Please keep in mind that all data from the mockup are fake. It's presented only for this research.

- Blood pressure, pulse, weight, temperature.
 - What do you think it can be useful for?
 - Daily activity, active calories burned
 - What is your activity goal? When can it be useful to you? How to change it?
 - Air quality in your room and outside
 - Your sleep habits
 - Exercise quality
6. Tell me also how you can use the "Stay in contact" module.
 - 6.1. Try to call someone from your family.
 - 6.2. Add a family member to your contact list
 7. You've just received a notification - read it. What does it mean? What should you do now?
 8. Try to personalize the Dashboard screen. What values should be presented there as the most important for you?

6.7.3 TASKS FOR CAREGIVERS

Initially, researchers should allow users to go through all the stages freely, on their own, asking caregivers to comment aloud on what they are doing and thinking. If during this, users skip any of the steps, the researcher should ask them for specific tasks, so that they will try to complete all the following:

Imagine that your colleague recommended this application to you as the best for taking care of seniors.

1. Start using this application
2. Create your account
3. Add a new senior
4. What do you see on the “list of seniors” screen?
 - 4.1. What seems the most useful here?
 - 4.2. What should be improved?
5. Tell me how Anna Smith’s health is?
 - 5.1. What should she improve?
 - 5.2. How are you going to tell her about it?
6. Tell me how Michael Johnson’s health changed last month?
 - 6.1. Take a look at his blood pressure, weight, body temperature, pulse
 - 6.2. Take a look at his daily activity and exercise correctness
 - 6.3. Take a look at his sleeping habits
 - 6.4. Take a look at air quality in his room and outside the house.
 - 6.5. What should he improve?
7. You’ve just received a notification - read it. What does it mean? What should you do now?

6.8 APPENDIX H. SEMI-STRUCTURED INTERVIEW

1. Start the semi-structured interview.
 - 1.1. Start the audio recorder (with authorization of the participants)
 - 1.2. Start the interview with these questions:
 1. Did you use the system every day?
 2. What kind of functionality did you use most often? Why?
 3. What kind of functionality did you use least often? Why?
 4. Do you encounter problems in the use of the system in general? If it's possible, can you show me the problem?
 5. [only for senior] Do you encounter problems in the use of the connected watch? If it's possible, can you show me the problem?
 6. [only for senior] Do you encounter problems in the use of the box? If it's possible, can you show me the problem?
 7. [only for senior] Do you encounter problems in the use of the tablet? If it's possible, can you show me the problem?
 8. Do you have any suggestions for improvements to the application?
 9. Do you want to use this system after?
 10. Do you want to advise this system to your relative?
 11. Do you have other remarks (positive or negative)?

6.9 APPENDIX I. SUS (SOFTWARE USABILITY SCALE).

The system Usability Scale Standard Version		Strongly disagree				Strongly agree
		1	2	3	4	5
1	I think that I would like to use this system.	0	0	0	0	0
2	I found the system unnecessarily complex.	0	0	0	0	0
3	I thought the system was easy to use.	0	0	0	0	0
4	I think that I would need to support of a technical person to be able to use this system.	0	0	0	0	0
5	I found the various functions in the system were well integrated.	0	0	0	0	0
6	I thought there was too much inconsistency in this system.	0	0	0	0	0
7	I would imagine that most people would learn to use this system very quickly.	0	0	0	0	0
8	I found the system very cumbersome to use.	0	0	0	0	0
9	I felt very confident using the system.	0	0	0	0	0
10	I needed to learn a lot of things before I could get going with this system.	0	0	0	0	0

For calculate the score:

“To calculate the SUS score, first sum the score contributions from each item. Each item's score contribution will range from 0 to 4. For items 1,3,5,7, and 9 the score contribution is the scale position minus 1. 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 value of SU. SUS scores have a range of 0 to 100.”



6.10 APPENDIX J. QUESTIONNAIRE FOR THE APPRECIATION OF EACH FUNCTIONALITY BY USERS

For each feature indicate if it is useful on a scale of one to five.

1 being not at all useful and 5 being very much useful.

Sleep monitoring

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Health module

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notifications

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Stay in contact

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Air quality

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Physical exercise

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Daily Activity

Not at all useful				Very much useful
1	2	3	4	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6.11 APPENDIX K. OBSERVATION OF USING THE PELOSHA PLATFORM FOR THE FIRST TIME - A CHECKLIST

Researchers should observe users when they use the Pelosha application for the first time. Every time users ask for help – the researcher should answer questions, explain how to use that feature, and make a note about this specific problem. The moderator should allow users to move freely around the application observing them and taking notes. If the user does not use some features, they should be asked to do so. For example: "Please go to the temperature measurement details screen and tell me what do you see on it."

6.11.1 SENIORS

Creating an account

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	Other observation

Choosing modules

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Setting up modules

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Dashboard content

Did the user use this screen on his/her own or was asked to do it?	What problems did he/she have with this screen?	How did he/she understand this screen and content?



Dashboard – changing modules on the main blocks.

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Notifications

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Health module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Daily activity module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Air quality module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Sundown module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Exercise quality module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Stay in touch module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Other observation

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6.11.2 CAREGIVERS

Creating an account

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Adding seniors

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Manage seniors from a list (if possible)

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Seniors' details

Did the user use this screen on his/her own or was asked to do it?	What problems did he/she have with this screen?	How did he/she understand this screen and content?

Sending tasks for senior

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Notifications

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Health module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Daily activity module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Air quality module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Sundown module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



Exercise quality module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature

Stay in touch module

Did the user use this feature on his/her own or was asked to do it?	What problems did he/she have with this feature?	How did he/she understand this feature



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Other observation



6.12 APPENDIX L. RESEARCHER OBSERVATION – A CHECKLIST

The researcher should ask a senior to use the Pelosha application as usual. The researcher should allow users to move freely around the app, watching them, and taking notes. If the user does not use some features, they should be asked to do so. For example: "Please go to the temperature measurement details screen and tell me how do you use it."

6.12.1 SENIORS

Using the dashboard

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Notifications

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Health module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Daily activity module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Air quality module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Sundown module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Exercise quality module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Stay in touch module

What do seniors like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Other observation

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6.12.2 CAREGIVERS

Manage seniors from a list (if possible)

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Senior's details

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Sending tasks for senior

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Notifications

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Health module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Daily activity module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Air quality module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Sundown module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Exercise quality module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments



Stay in touch module

What do caregivers like in this feature the most? What is less important/useful?	What problems do they have with this feature?	Other comments

Other observation

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6.13 APPENDIX M. MEASUREMENTS PRESENTATION

The researcher should ask seniors if – from their experience – the Pelosha showed them correct values, or maybe they noticed some mistakes?

6.13.1 SENIORS

Health module

Blood pressure	Pulse	Temperature	Bodyweight
details...	details...	details...	details...

Daily activity module

details...



Air quality module

Temperature (inside / outside)	Humidity (inside / outside)	CO2 - inside
details...	details...	details...

Exercise quality module

details...

6.14 APPENDIX N. ANALYTICAL DATA TO MEASURE

All values should be able to be filtered by User ID. The logging will be based on events. For each event, developers have to log the exact date and time and event-specific details (to be defined later).

6.14.1.1.1 *Seniors app – Assistant*

1. Dashboard
 - a. Each click on an individual link leading to module details (from main blocks vs. from bottom navigation)
 - b. Each event when a user selects one of the parameters to be displayed on one of the main blocks.
2. Time spent on the help page, and using tabs.
3. Module's page views.
 - a. Each event when a user opens each module's page, (or subpages)
 - b. Filters usage. (The number of clicks in each filter and chosen filter value)
4. Adding measurements
 - a. Each event when a user initiates adding of a measurement („+measure” button, and specific measure - pulse, blood pressure etc.)
5. Notifications
 - a. Urgent
 - i. Next step/click after receiving an urgent notification
 - b. Normal
 - i. Next step/click after receiving a normal notification
6. Setting usage
 - a. Activity goal changing
 - b. User data changes

6.14.1.1.2 *Caregiver app*

1. List of seniors
 - a. Each click on a link leading to seniors' details
2. Senior's details
 - a. Each click on an individual link leading to module details
3. Module page views.
 - a. Each event when a user opens each module page, (or subpage)
 - b. Filters usage. (The number of clicks in each filter and chosen filter value)
4. Sending tasks/events to senior – how often? How many times?
5. Notifications
 - a. Urgent
 - i. Next step / click after receiving an urgent notification
 - b. Normal



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- i. Next step / click after receiving an urgent notification



6.15 APPENDIX O. WHOQOL-BREF

When the WHOQOL instrument or similar will be used. This questionnaire should not be made public. Thus we provide only the link to where the instrument can be obtained:
https://www.who.int/mental_health/publications/whoqol/en/



6.16 APPENDIX P. WHOQOL-OLD

When the WHOQOL instrument or similar will be used. This questionnaire should not be made public. Thus we provide only the link to where the instrument can be obtained:

https://www.who.int/mental_health/publications/whoqol/en/



6.17 APPENDIX Q. 36-ITEM SHORT FORM SURVEY INSTRUMENT (SF-36)

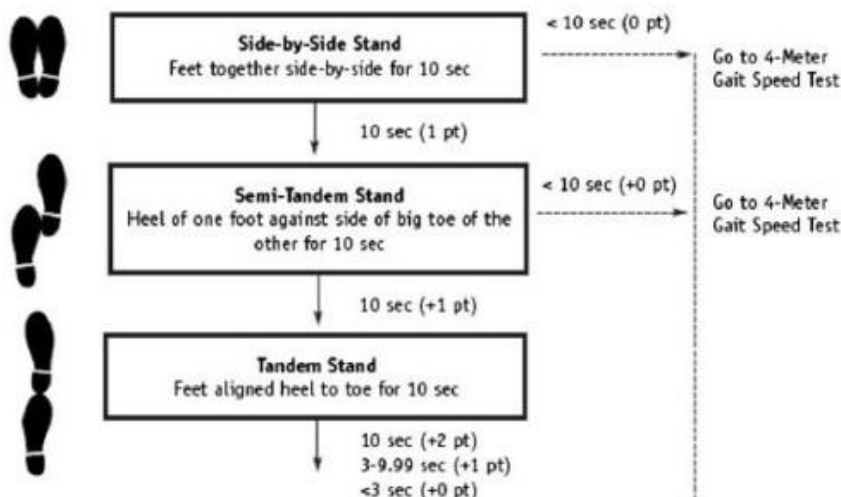
You can have access to the instrument to [this link](#)

(https://www.rand.org/content/dam/rand/www/external/health/surveys_tools/mos/mos_core_36_item_survey.pdf)

6.18 APPENDIX R. SHORT PHYSICAL PERFORMANCE BATTERY (SPPB)

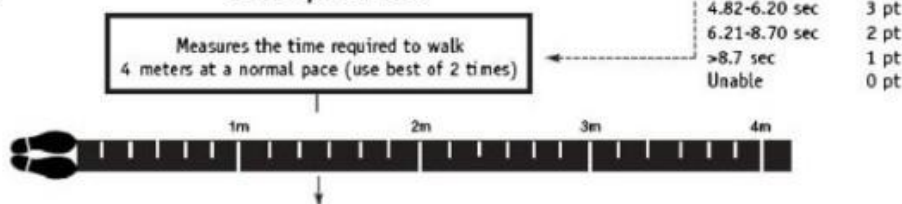
1.

Balance Tests



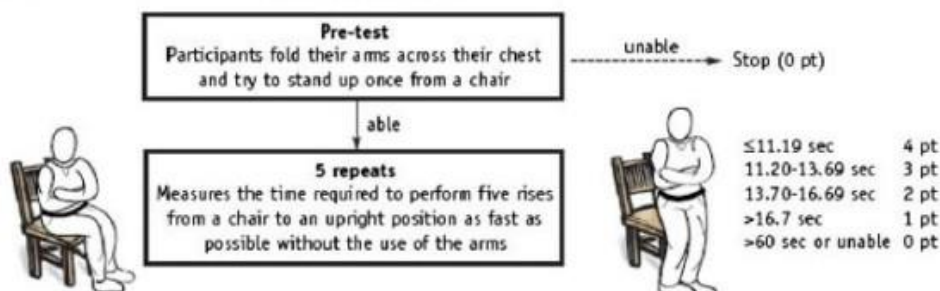
2.

Gait Speed Test



3.

Chair Stand Test



Extract from: Rodríguez-Mañas, Leocadio & Bayer, Antony & Kelson, Mark & Zeyfang, Andrej & Izquierdo, Mikel & Laosa, Olga & Hardman, Tim & Sinclair, Alan. (2014). An evaluation of the effectiveness of a multi-modal intervention in frail and pre-frail older people with type 2 diabetes - the MID-Frail study: Study protocol for a randomised controlled trial. *Trials*. 15. 34. 10.1186/1745-6215-15-34.



6.19 APPENDIX S. HOME NURSE QUESTIONS

1. How many seniors are you taking care of now?
2. What is the most challenging while working with seniors?
3. How do you deal with a senior who isn't satisfied with your care?
4. What do you think is the greatest caregiver's skill?
5. How do you organize your work?
6. How do you handle the stress of the job?
7. What do you find is the hardest part about being a nurse?
8. What kind of help seniors need the most often?
9. How physically active are seniors these days?
10. How do you encourage them to be physically active?
11. How do you encourage them to control their health regularly?
12. How do you educate seniors to live healthy and active?



6.20 APPENDIX T. CAREGIVER BURDEN INVENTORY (CBI)

Time-Dependence Burden					
My care receiver needs my help to perform many daily tasks	0	1	2	3	4
My care receiver is dependent on me.	0	1	2	3	4
I have to watch my care receiver constantly.	0	1	2	3	4
I have to help my care receiver with many basic	0	1	2	3	4
I don't have a minute's break from my caregiving	0	1	2	3	4
Developmental Burden					
I feel that I am missing out on life.	0	1	2	3	4
I wish I could escape from this situation.	0	1	2	3	4
My social life has suffered.	0	1	2	3	4
I feel emotionally drained due to caring for my care receiver	0	1	2	3	4
I expected that things would be different at this point in my life	0	1	2	3	4
Physical Burden					
I'm not getting enough sleep.	0	1	2	3	4
My health has suffered.	0	1	2	3	4
Caregiving has made me physically sick.	0	1	2	3	4
I'm physically tired.	0	1	2	3	4
Social Burden					
I don't get along with other family members as well as I used to.	0	1	2	3	4
My caregiving efforts aren't appreciated by others in my family.	0	1	2	3	4
I've had problems with my marriage.	0	1	2	3	4
I don't do as good a job at work as I used to.	0	1	2	3	4



I feel resentful of other relatives who could but do not help.	0	1	2	3	4
Emotional Burden					
1. I feel embarrassed over my care receiver's behavior.	0	1	2	3	4
2. I feel ashamed of my care receiver.	0	1	2	3	4
3. I resent my care receiver.	0	1	2	3	4
4. I feel uncomfortable when I have friends over.	0	1	2	3	4
5. I feel angry	0	1	2	3	4

0 = not at all; 1 = a little; 2 = moderately; 3 = much; 4 = very much.

6.21 APPENDIX U. SUMMARY DESCRIPTION OF TEST STAGES

Study	Alpha			
	Pre-Alpha	Pre-Alpha Corrections	Alpha Main Test	Post-Alpha Summary
Date	2020			
Pilot phase length	2 weeks			
Goal	Discover faults in the Alpha test methodology	Improve faults in the Alpha test methodology	Collect valuable feedback about the user interface	Correct the user interface in the PELOSHA platform
Type of test	Usability test		Usability test	
Nr. Pps.	Switzerland: 1 senior, 1 caregiver Belgium: 1 senior, 1 caregiver Poland: 1 senior, 1 caregiver		Switzerland: 5 seniors, 5 caregivers Belgium: 5 seniors, 5 caregivers Poland: 5 seniors, 5 caregivers	
Duration per participant	1,5 hour		1,5 hour	



Study	Beta 1.0					
	Pre- Beta 1.0	Pre- Beta 1.0 Corrections	Beta 1.0 Main Test			Post- Beta 1.0 Summary
			Step 1: Introduction	Step 2: Observation	Step 3: Usage Data Analytics	
Date	2021					
Pilot phase length			2 weeks			
Goal	Discover faults in the Beta 1.0 test methodology and the Beta 1.0 test process	Correct all mistakes with the Beta 1.0 test process, and the test scenario	Collect valuable feedback about the platform's user interface and technical problems			Correct the user interface in the PELOSHA platform, and
Type of test	Observation , interviews, usability test		Observation, interviews Researchers should be present when the system is installed, observe the users, and explain to them things, which are not clear enough.	Observation, interviews After a few days of using the PELOSHA platform, users show how they use it.	Collecting usage data , The usage data should be gathered for the whole Beta Test 1	
Nr. Pps.	<u>Switzerland:</u> 1 senior, 1 caregiver		<u>Switzerland, Geneva:</u> 5 seniors, 5 caregivers <u>Switzerland, Berlingen:</u>	<u>Switzerland, Geneva:</u> 5 seniors, 5 caregivers <u>Switzerland, Berlingen:</u>	<u>Switzerland, Geneva:</u> 5 seniors, 5 caregivers <u>Switzerland, Berlingen:</u>	



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	<u>Belgium:</u> 1 senior, 1 caregiver <u>Poland:</u> 1 senior, 1 caregiver		5 seniors, 5 caregivers <u>Belgium:</u> 5 seniors, 5 caregivers <u>Poland:</u> 5 seniors, 5 caregivers	5 seniors, 5 caregivers <u>Belgium:</u> 5 seniors, 5 caregivers <u>Poland:</u> 5 seniors, 5 caregivers	5 seniors, 5 caregivers <u>Belgium:</u> 5 seniors, 5 caregivers <u>Poland:</u> 5 seniors, 5 caregivers	
Duration per participant	2h-4h (not including the PELOSHA platform installation time)		2h-4h (not including the PELOSHA platform installation time)	2h-4h (not including the PELOSHA platform installation time)		



Study		Beta 1.1						
	Pre-Beta 1.1	Pre-Beta 1.1 Corrections	Beta 1.1 Main Test					Post-Beta 1.1 Summary
			Step 1: Baseline	Step 2: Introduction/Installation	Step 3: Observation	Step 4: Usage Data Analytics	Step 5: Final research	
Date	2021							
Pilot phase length	4 weeks							
Goal	Discover faults in the Beta 1.1 user interface test methodology and in the PELOSHA platform	Correct all mistakes with the platform installation, and test scenario	Prepare baseline knowledge about senior's and caregiver's quality of life, work, health, and fitness.	Introduction users to the platform and find out what problems users can still have during the first contact with the PELOSHA platform.	Find out what problems with the PELOSHA user interface remained.	Collecting usage data , The usage data should be gathered for the whole Beta Test 1.1	Verify whether there are changes in the life, health, and work comfort of users after a month of using PELOSHA.	



	rm after Beta 1.1 test impro veme nts.							
Type of test	Obser vation , interv iews, usabil ity test		Health and fitness tests	observation, surveys	observation, surveys,		Health and fitness tests	
Nr. Pps.	Switz erlan d: 1 senior , 1 caregi ver Belgiu m: 1 senior , 1 caregi ver Polan		<u>Switzerland, Geneva:</u> 15 seniors, 15-30 caregivers <u>Switzerland, Berlingen:</u> 15 seniors, 15-30 caregivers <u>Belgium:</u> 15 seniors, 15-30 caregivers	<u>Introducing the platform to users (no observations):</u> <u>Switzerland, Geneva :</u> 10 seniors, 10-25 caregivers <u>Switzerland, Berlingen</u> 10 seniors, 10-25 caregivers <u>Belgium:</u>	<u>Switzerland:</u> 5 seniors, 5 caregivers <u>Belgium:</u> 5 seniors, 5 caregivers <u>Poland:</u> 5 seniors, 5 caregivers	<u>Switzerland, Geneva:</u> 15 seniors, 15-30 caregivers <u>Switzerland, Berlingen:</u> 15 seniors, 15-30 caregivers <u>Belgium:</u> 15 seniors, 15-30 caregivers	<u>Switzerland, Geneva:</u> 15 seniors, 15-30 caregivers <u>Switzerland, Berlingen:</u> 15 seniors, 15-30 caregivers <u>Belgium:</u> 15 seniors,	



	d: 1 senior, 1 caregiver		<u>Poland:</u> 15 seniors, 15-30 caregivers	10 seniors, 10-25 caregivers <u>Poland:</u> 10 seniors, 10-25 caregivers <u>Introducing the platform to users with additional users observation:</u> <u>Switzerland, Berlingen</u> 5 seniors, 5 caregivers <u>Switzerland, Geneva</u> 5 seniors, 5 caregivers <u>Belgium:</u> 5 seniors, 5 caregivers <u>Poland:</u> 5 seniors, 5 caregivers		<u>Poland:</u> 15 seniors, 15-30 caregivers	15-30 caregivers <u>Poland:</u> 15 seniors, 15-30 caregivers	
Duration	2h-4h		2 h for seniors and	<u>Introducing the</u>	1-2h per user		2 h for	



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per participant	(not including the PELOSHA platform installation time)		1h for caregivers	<u>platform to users:</u> 1h per user <u>Introducing the platform to users with additional users observation:</u> 1-2h per user			seniors and 1h for caregivers	
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