PELOSHA

www.pelosha.eu

PERSONALIZABLE SERVICES FOR SUPPORTING HEALTHY AGEING

PARTNERS

CO-FUNDED BY

PELOSHA overall design

Deliverable D1.2

Lead authors

Kinga Ćwiklińska[1], Katarzyna Jackowska[1], Karolina Kowalczyk[1],Laëtitia Gosetto[2], Frédéric Ehrler[2]

[1]Poznań Supercomputing and Networking Center

[2]University Hospitals of Geneva

This deliverable has been produced as part of the PELOSHA project which is co-financed through the AAL Joint Programme, managed by the AAL Association and supported financially by the European Commission within call no. AAL-2017 AAL packages / Integrated solutions. The project is also co-financed by national funding agencies in Poland, Belgium, Switzerland, and Hungary.

This deliverable is confidential / restricted / **public**.

Nature of this deliverable: **Report** / Prototype / Demonstrator / Other

Consortium partners contributing to this deliverable: Poznań Supercomputing and Networking Center (PSNC), University Hospitals of Geneva (HUG),Woonzorgcentrum Sint Jan Berchmans (SJB), terzStiftung (TERZ)

Version/revision: 1.8

Delivery date: 1.06.2020

Versioning:

Version	Date	Organization
0.5	8.10.2019	HUG
0.8	28.10.2019	HUG
1.0	31.12.2019	PSNC
1.8	1.06.2020	PSNC

TABLE OF CONTENTS

ABBREVIATIONS

AAL	Active Assisted Living
COVID-19	Coronavirus Disease 2019
GUI	graphical user interface
HN	home nurse
IC	informal caregiver
PELOSHA	Personalizable services for supporting healthy ageing
UI	user interface
UX	user experience
SUS	System Usability Scale
WP	work package

1 INTRODUCTION

The aim of this deliverable is to present the initial state, effort, and current status of the design of the PELOSHA system, particularly its user interface. The interviews conducted with end users (seniors, formal and informal caregivers) allowed to identify the areas of specific interest for the end user base among the initial ideas prepared by the consortium. This set of areas of interest and insights (described in deliverable D1.1), confronted with the capabilities of the consortium and scope of the project, served as a base for an initial list of functionalities that the prepared solution is planned to provide. Afterwards, use cases regarding those functionalities were extracted from the user interview findings and developed further with the participation of representatives of the end user organizations within the project consortium. In the next step, mockups of the system's user interface were prepared, taking into account the use cases and all the aforementioned findings. Those mockups were used to hold co-design workshops with end users in order to gather their feedback and comments on this topic.

2 INITIAL UI MOCKUPS

The mockups presented in this section were created basing on the initial involvement of end users and end user organizations within the PELOSHA consortium, in the form of user needs interviews and use case definition workshops. The mockups were supposed to present a draft initial idea of the system's UI, which would later be evaluated by end users during further interviews. Therefore, many aspects of this first iteration of mockups were presented in a symbolic manner, and the main stress was not put on the aesthetic aspect. The mockups presented here include captions in English, but the actual mockups used were translated into the test subjects' languages, as explained in the section on user tests methodology.

The mockups allowed for a limited degree of interaction, which helped the test subjects better understand their intended functionality.

2.1 UI MOCKUPS FOR THE PELOSHA ASSISTANT FOR SENIORS

As established during previous user interviews, the PELOSHA Assistant used by the seniors is envisioned to run on a tablet device – this is reflected in the mockups.

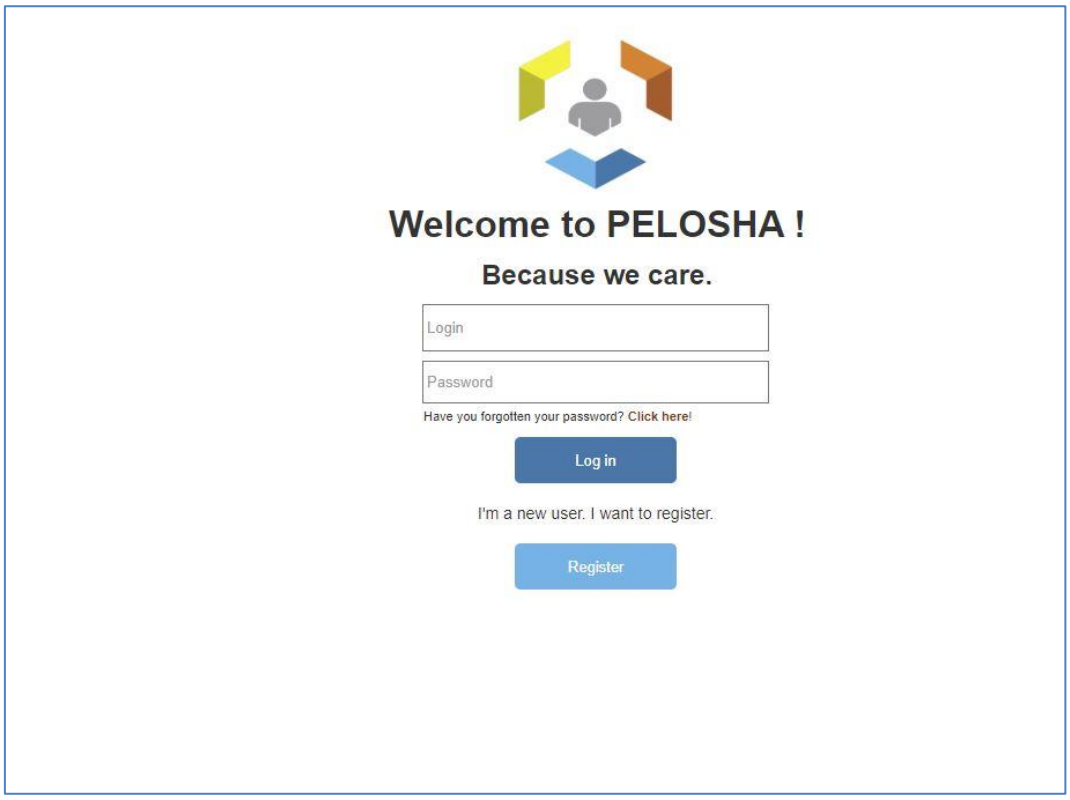

Fig. 1 PELOSHA Assistant welcome screen

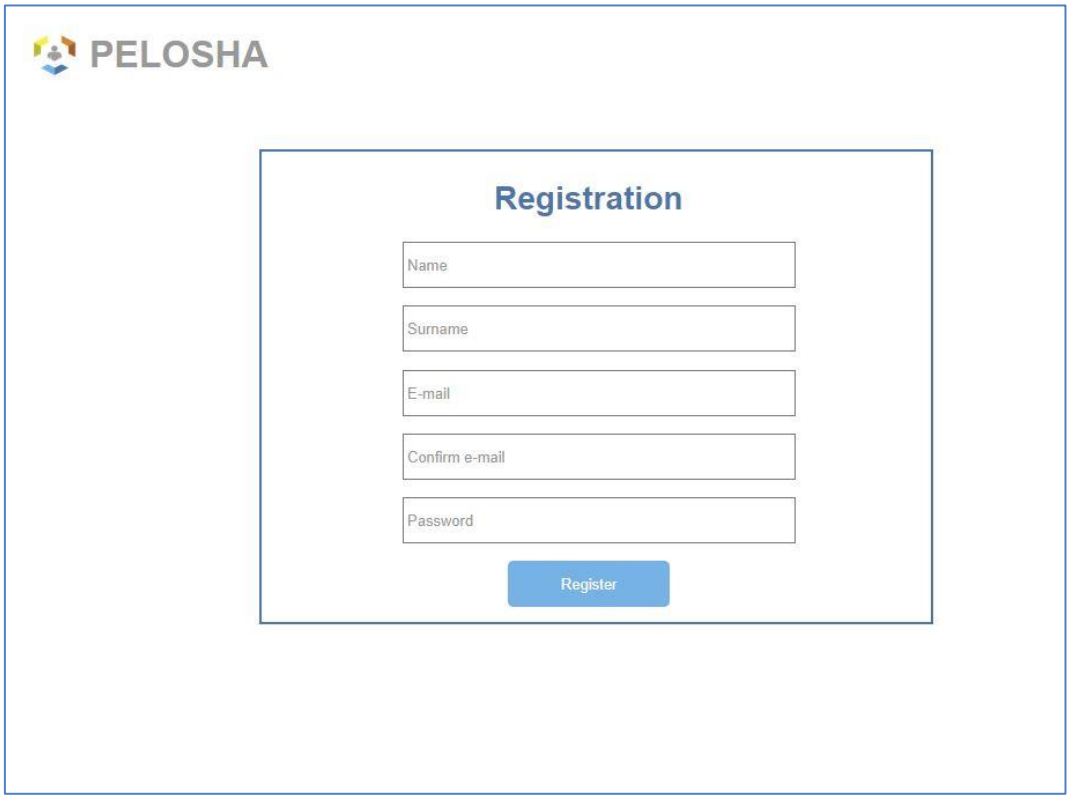

Fig. 2 PELOSHA Assistant registration screen

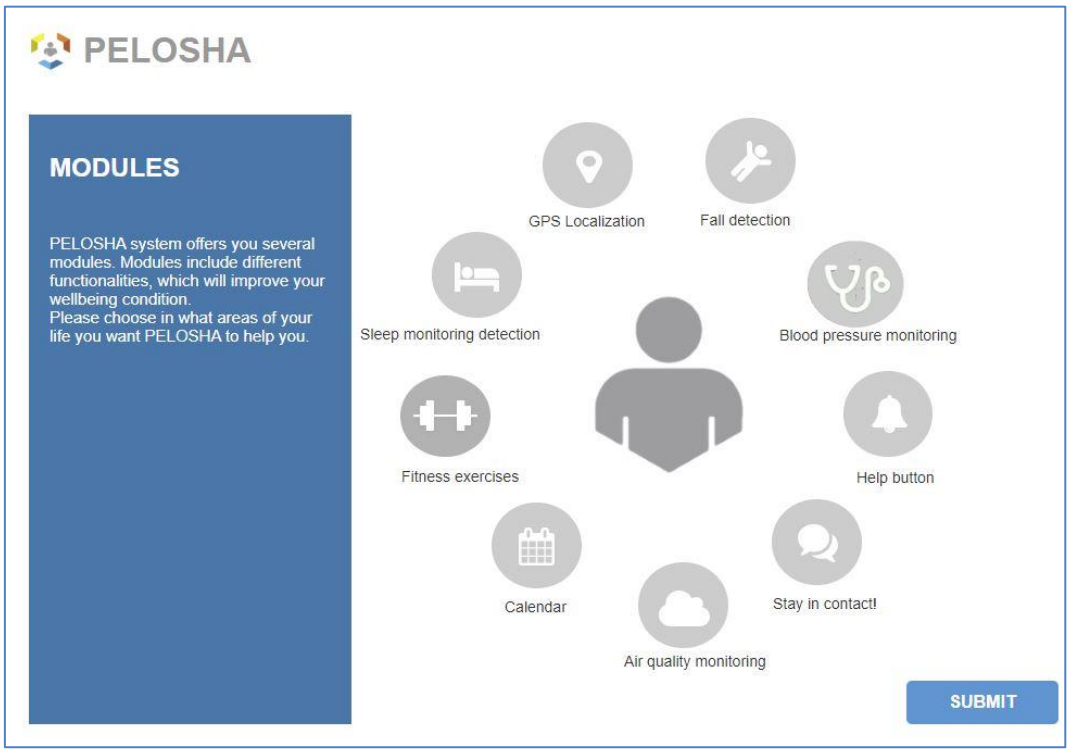

Fig. 3 PELOSHA Assistant module selection screen

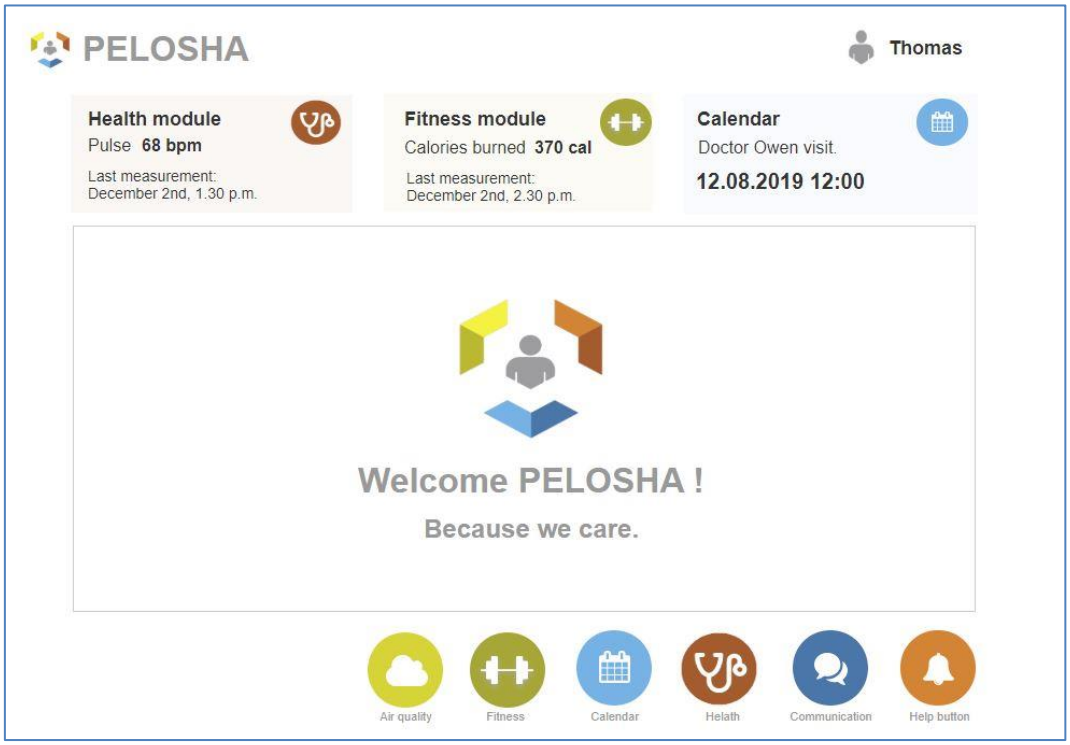

Fig. 4 PELOSHA Assistant main page screen

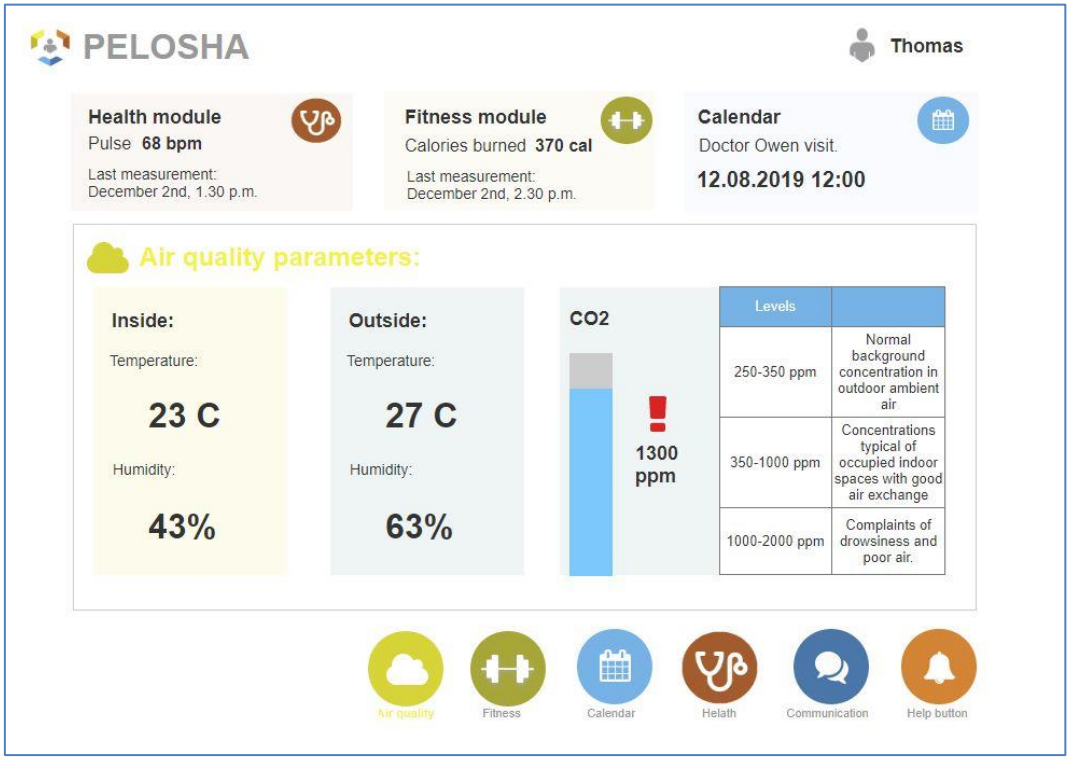

Fig. 5 PELOSHA Assistant Air Quality module screen

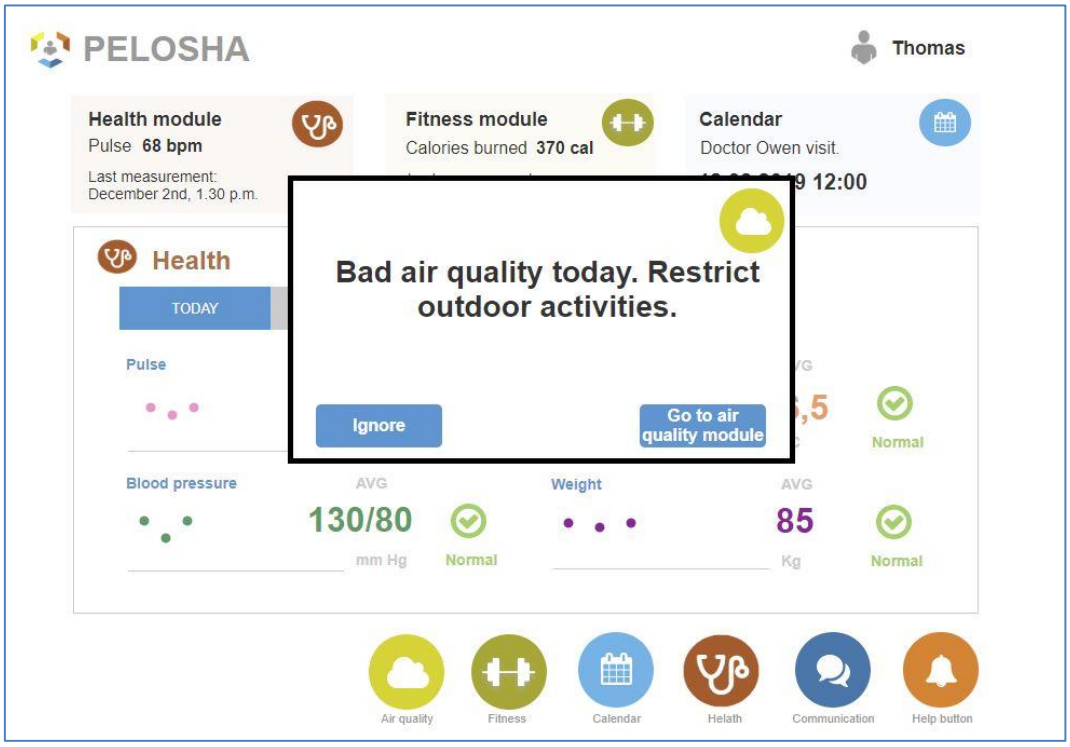

Fig. 6 PELOSHA Assistant bad air quality notification screen

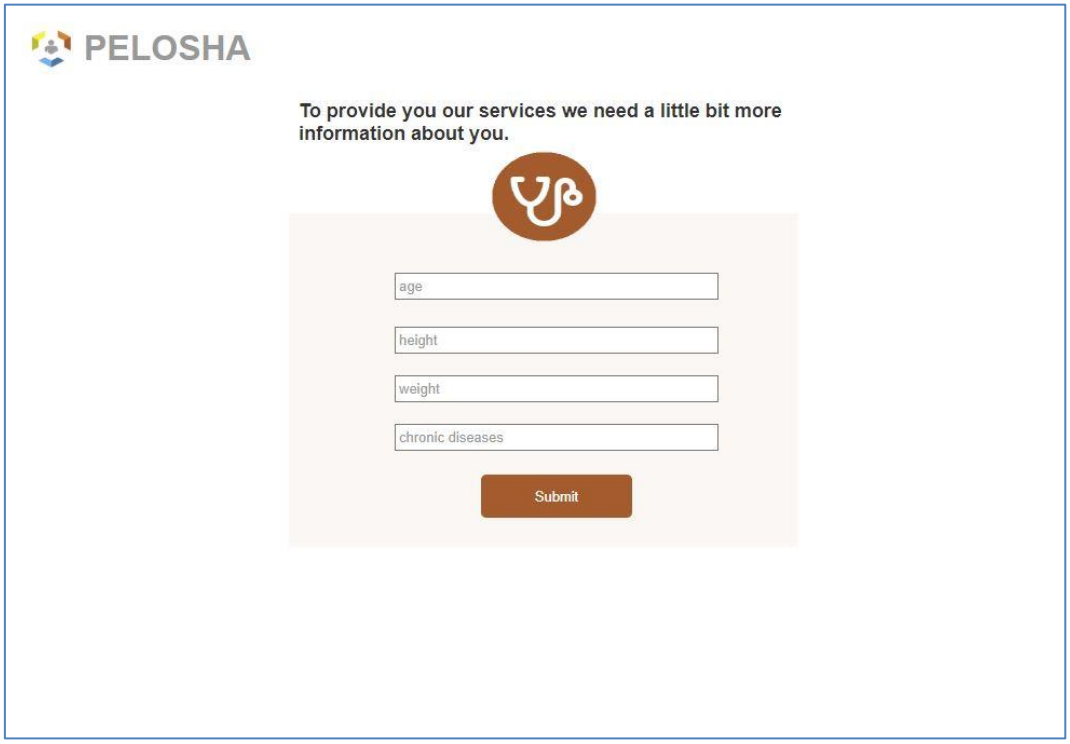

Fig. 7 PELOSHA Assistant Health module profile completion screen

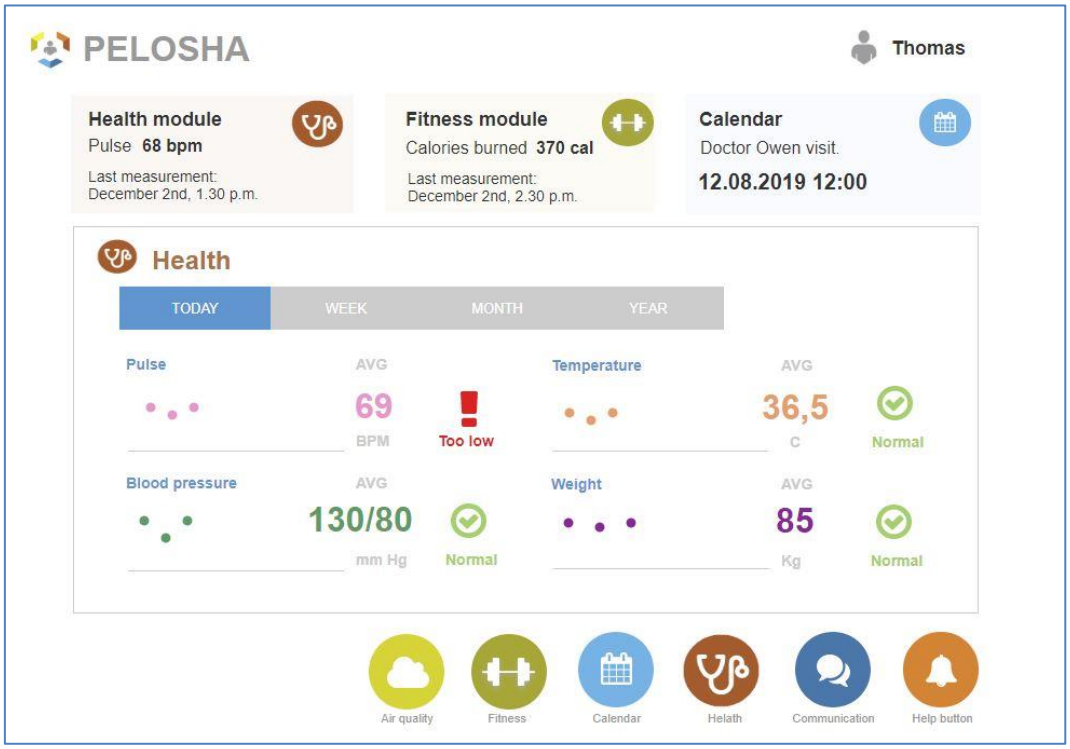

Fig. 8 PELOSHA Assistant Health module screen

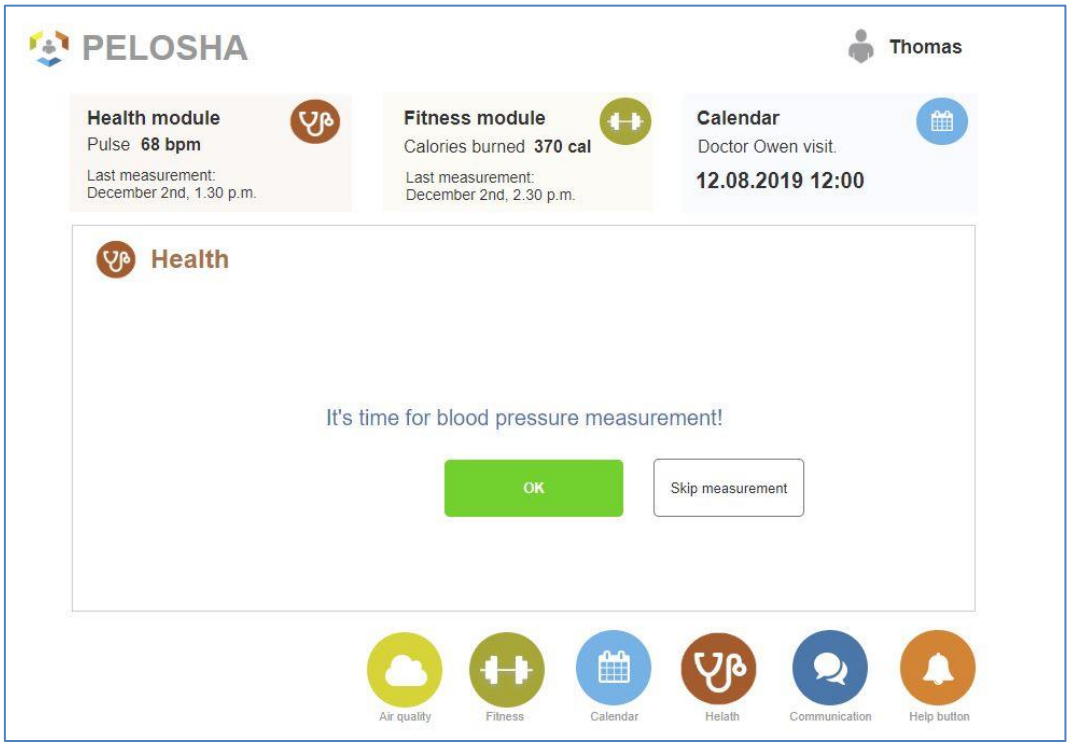

Fig. 9 PELOSHA Assistant blood pressure measurement notification screen

Fig. 10 PELOSHA Assistant Calendar module profile completion screen

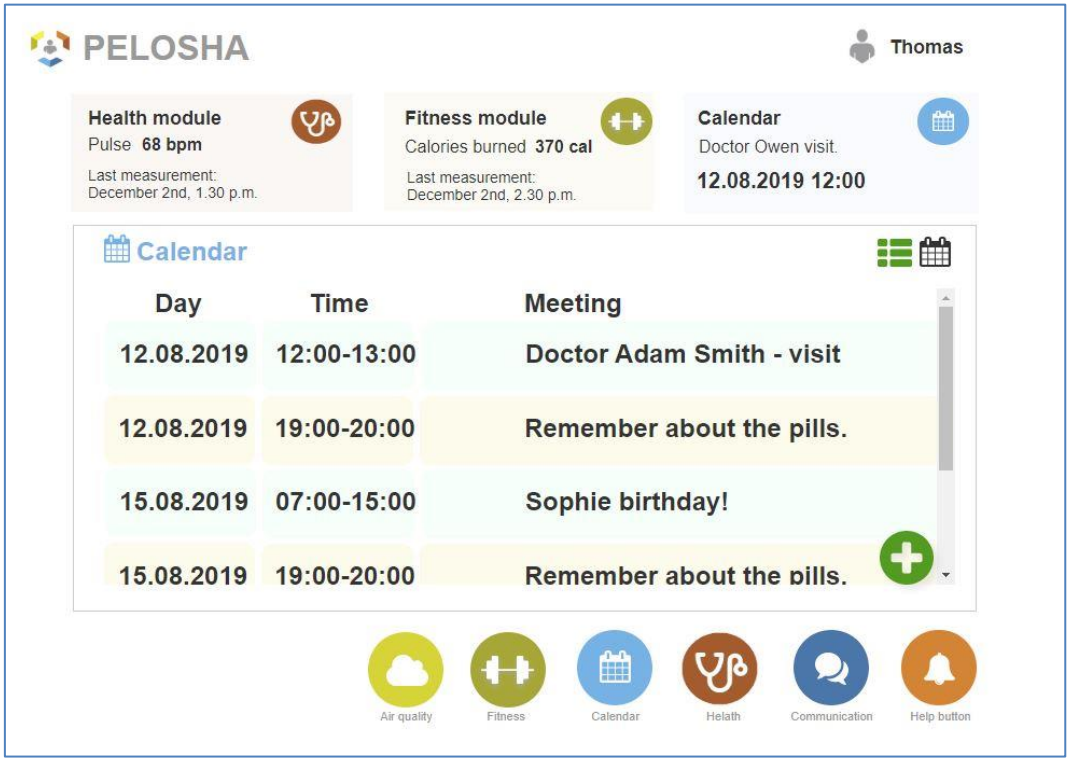

Fig. 11 PELOSHA Assistant Calendar module screen

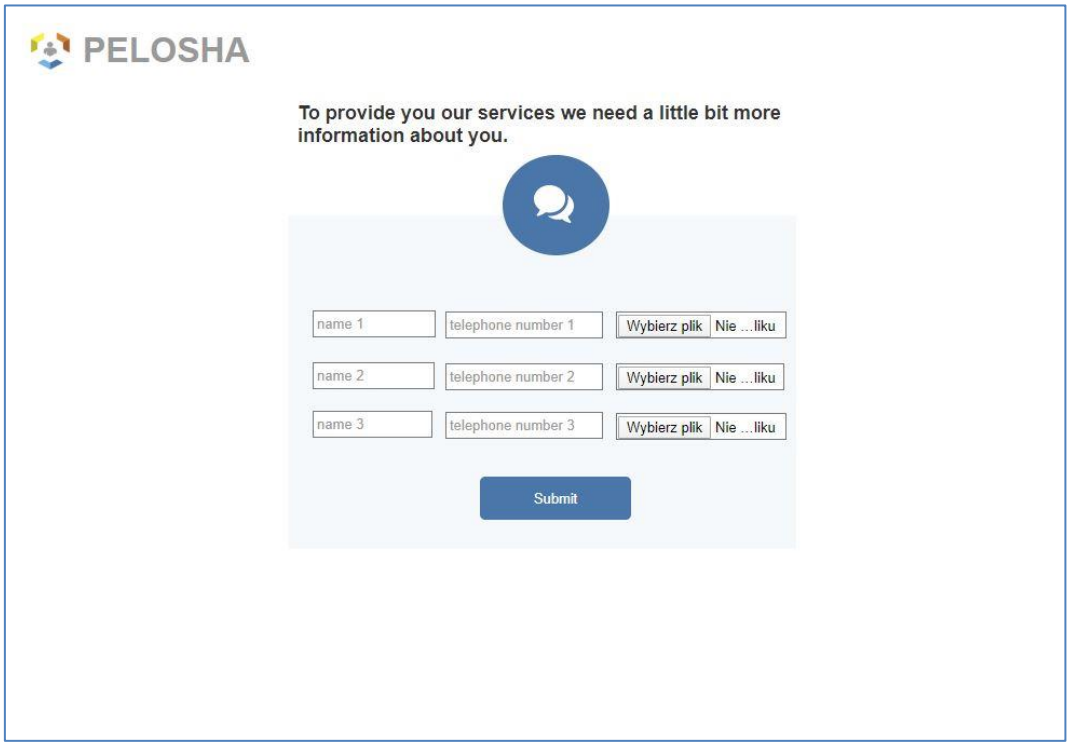

Fig. 12 PELOSHA Assistant Communication module profile completion screen

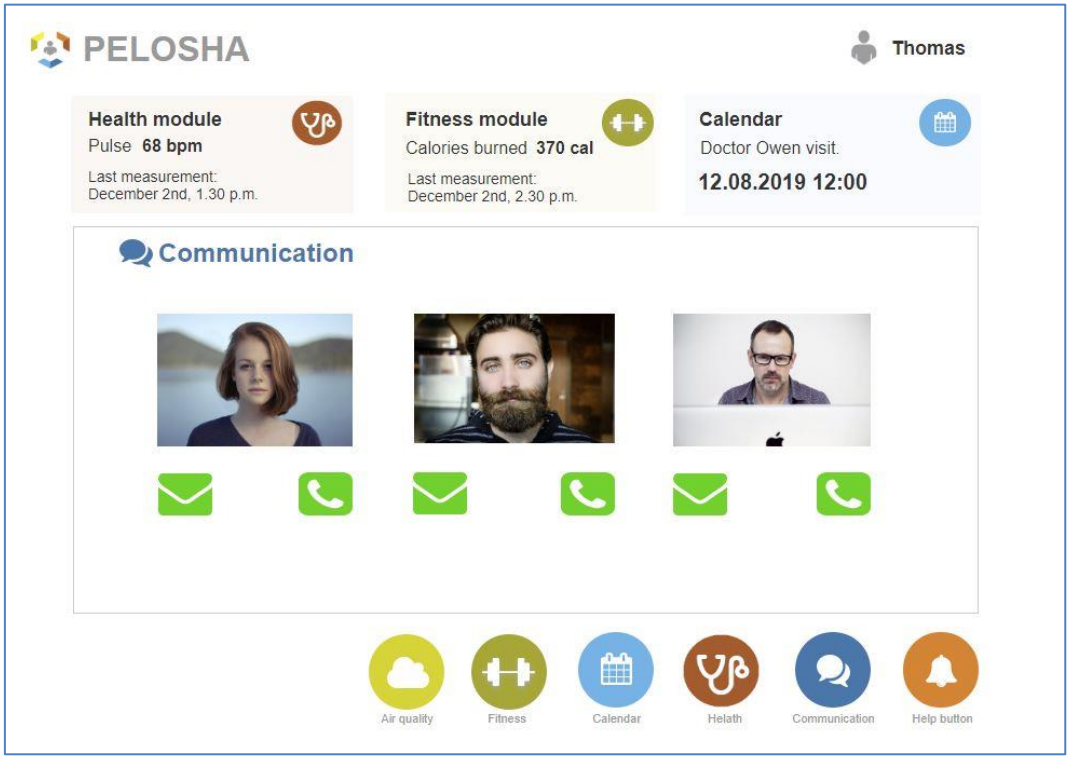

Fig. 13 PELOSHA Assistant Communication module screen

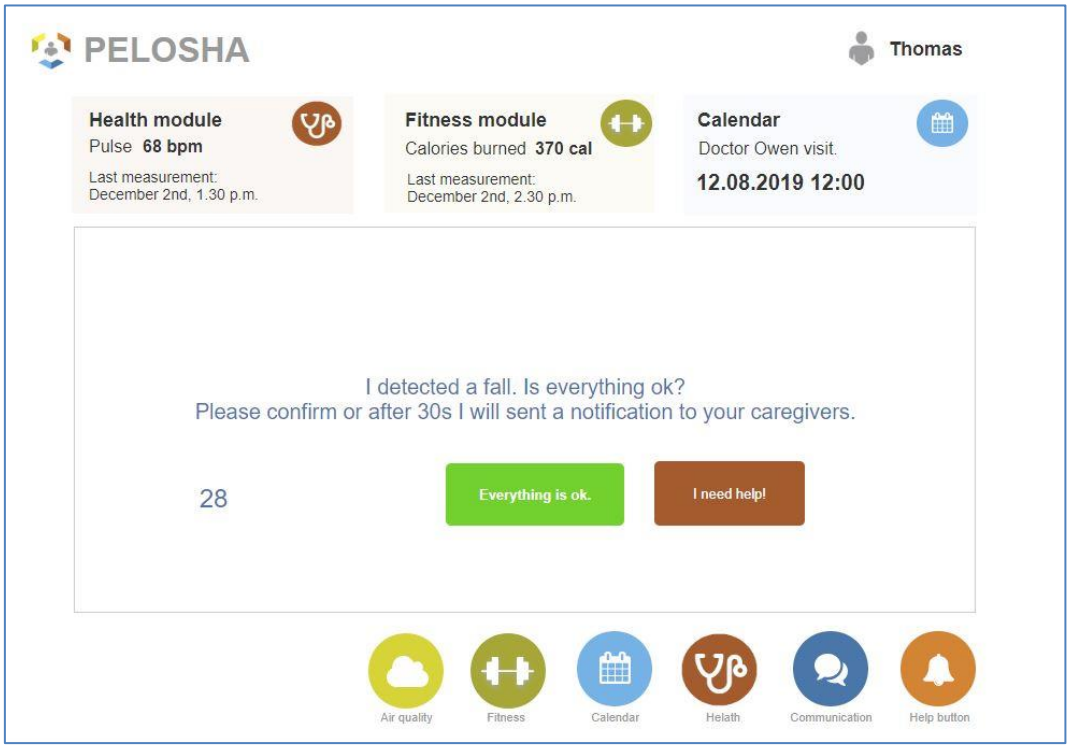

Fig. 14 PELOSHA Assistant fall detection notification screen

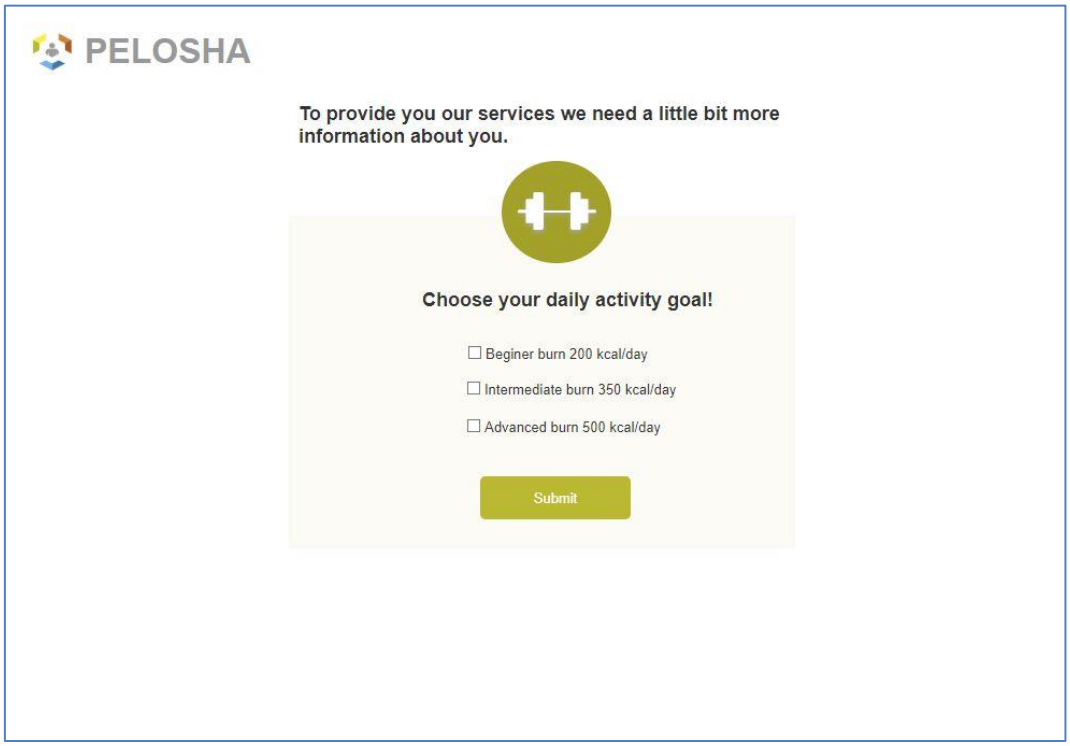

Fig. 15 PELOSHA Assistant Fitness module profile completion screen

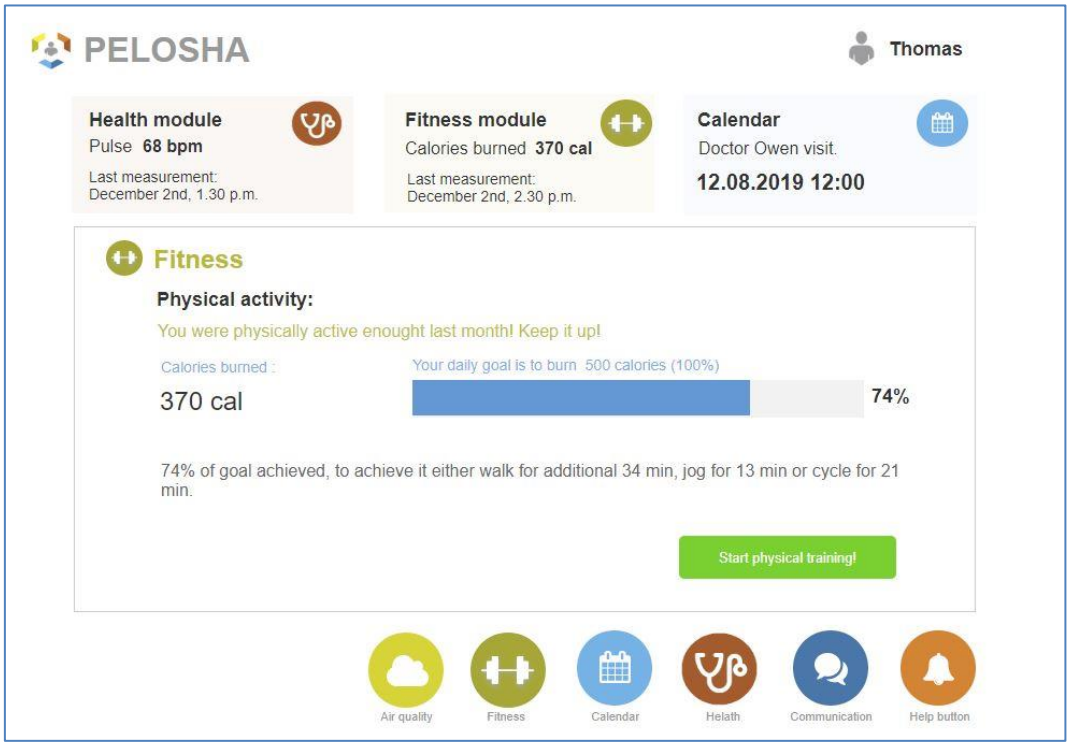

Fig. 16 PELOSHA Assistant Fitness module screen

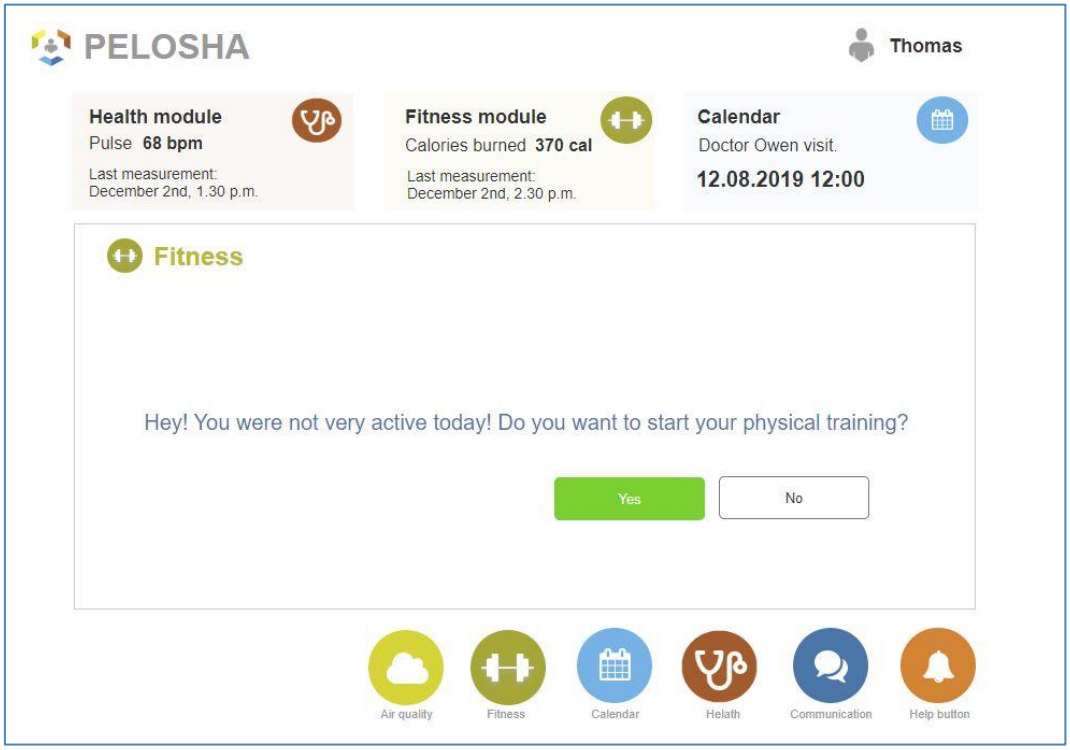

Fig. 17 PELOSHA Assistant Fitness module notification screen

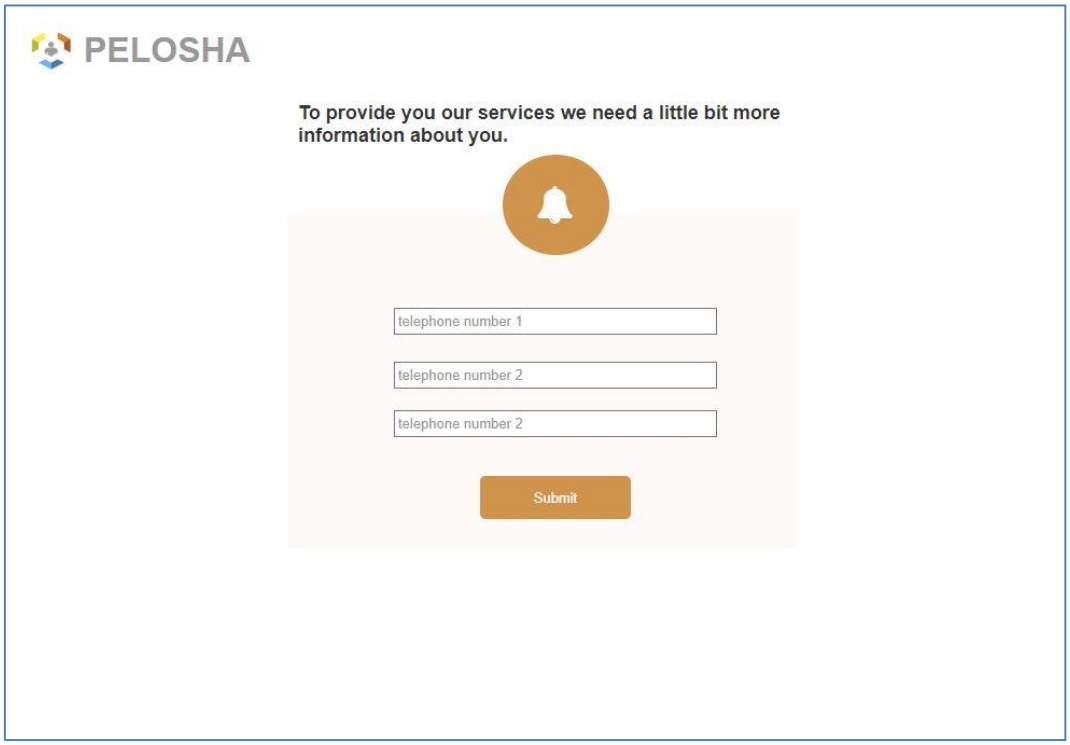

Fig. 18 PELOSHA Assistant Help button module profile completion screen

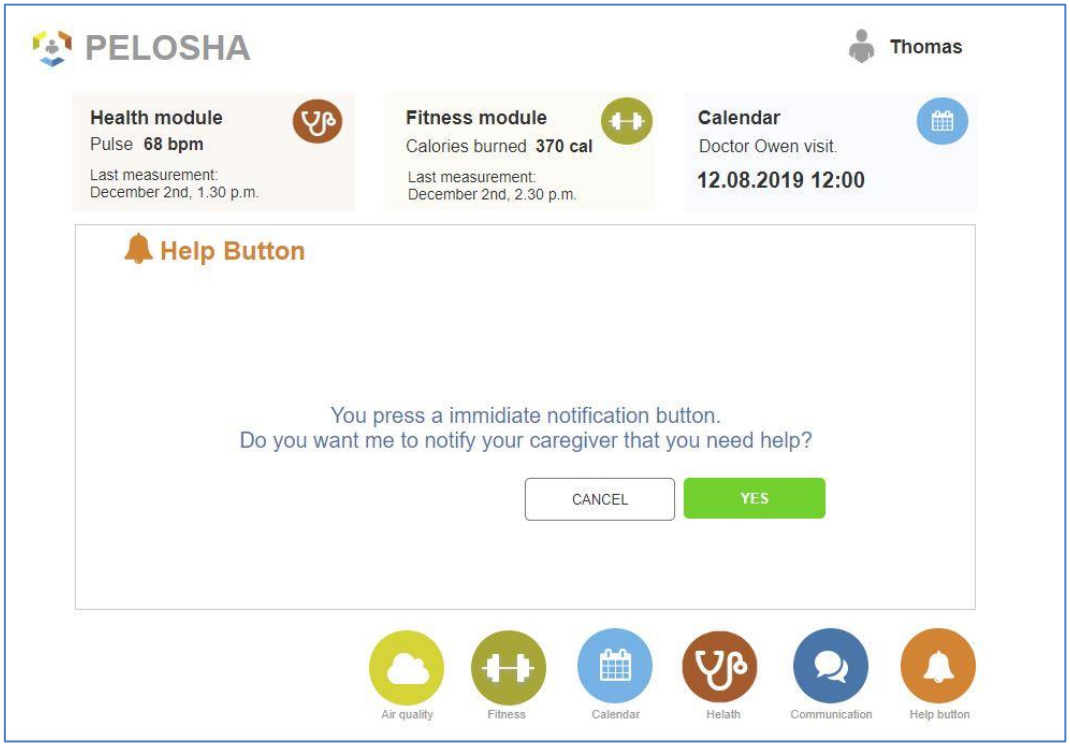

Fig. 19 PELOSHA Assistant Help button notification screen

2.2 UI MOCKUPS FOR THE CAREGIVER DASHBOARD

As established during previous user interviews, the Caregiver Dashboard used by the formal and informal caregivers is envisioned to run on a smartphone device – this is reflected in the mockups.

Fig. 20 Caregiver Dashboard welcome screen

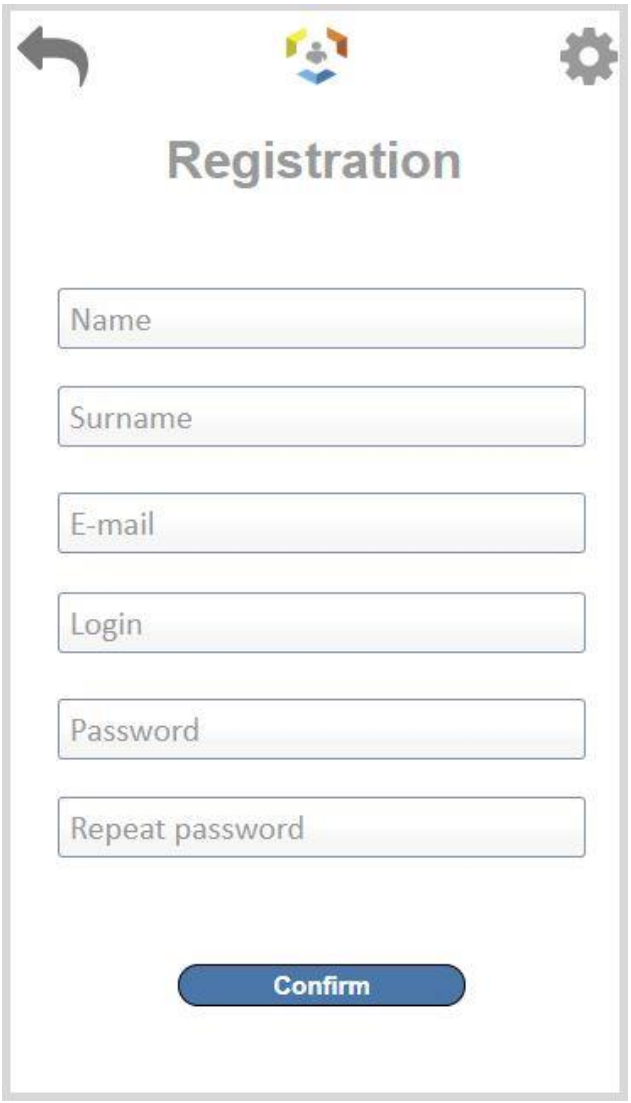

Fig. 21 Caregiver Dashboard registration screen

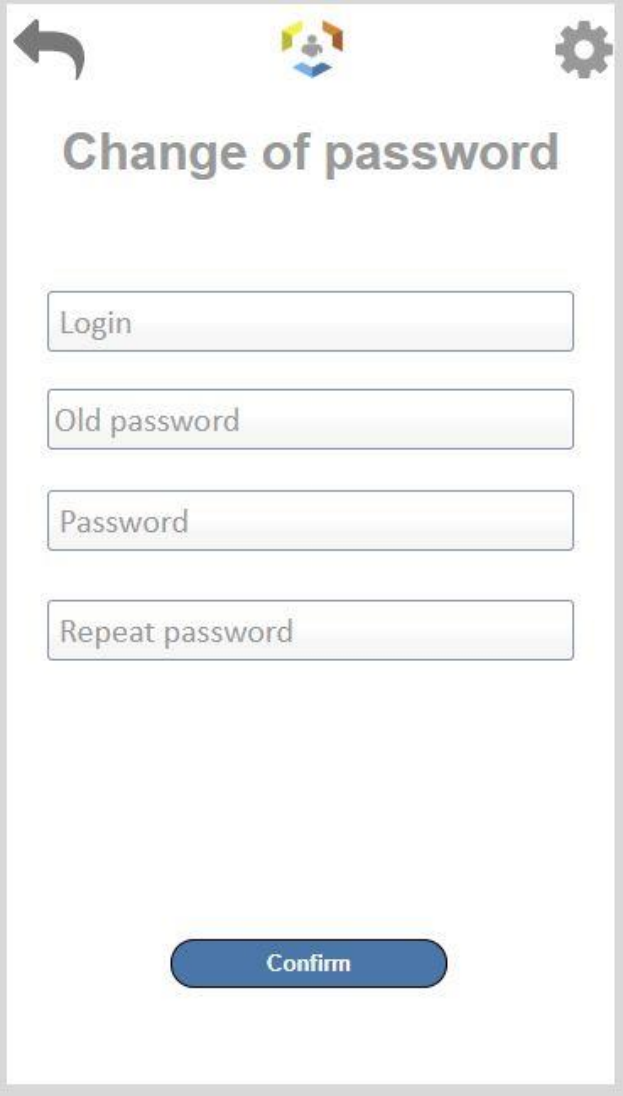

Fig. 22 Caregiver Dashboard password change screen

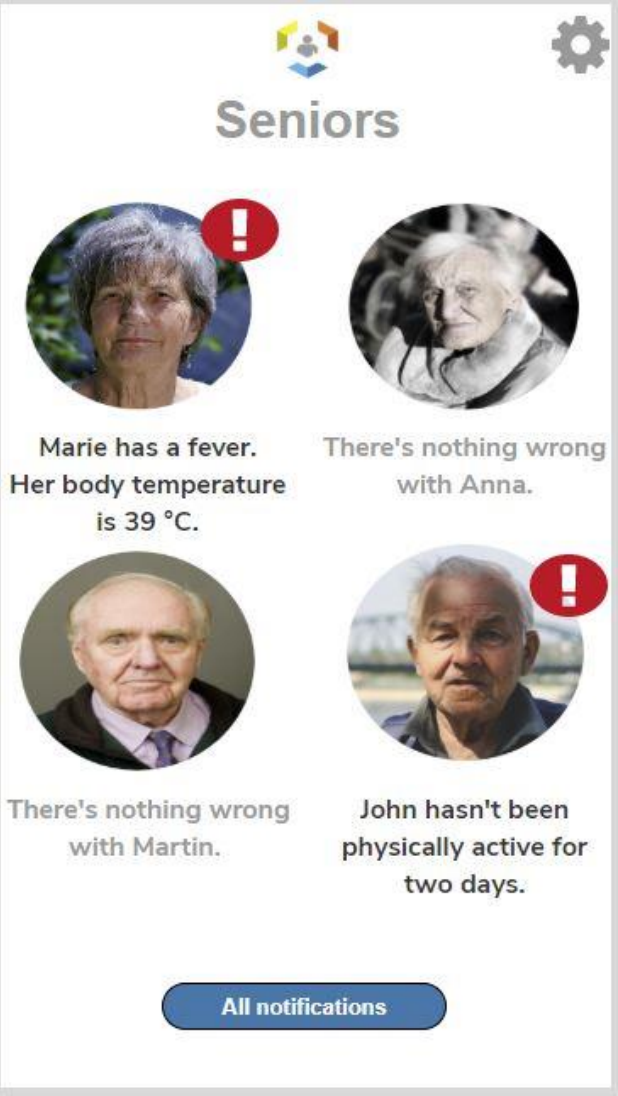

Fig. 23 Caregiver Dashboard list of seniors screen

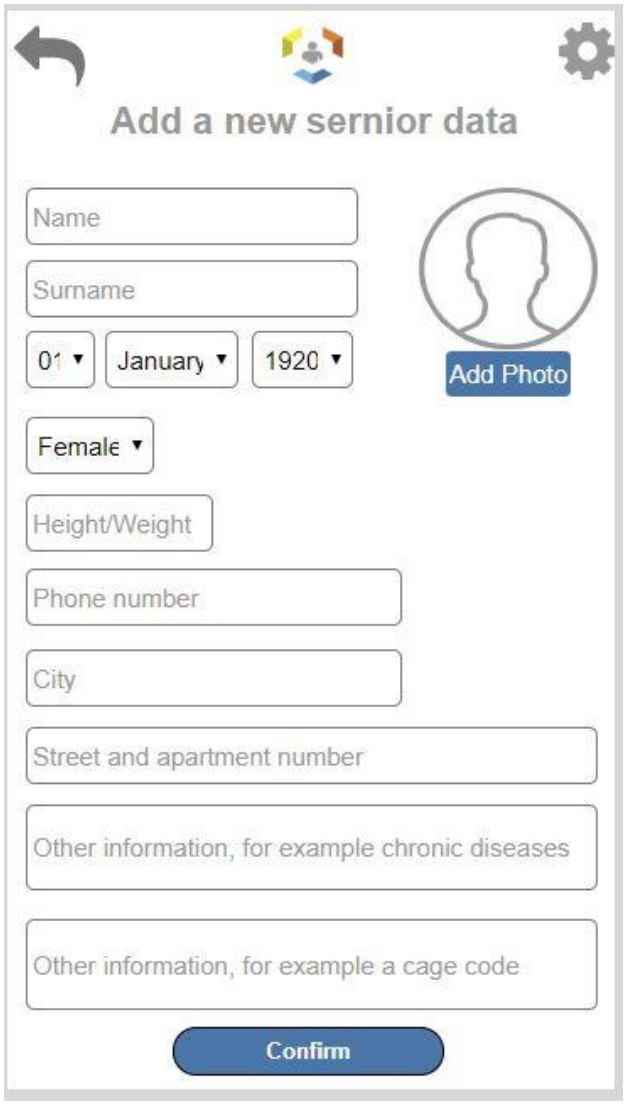

Fig. 24 Caregiver Dashboard add senior screen

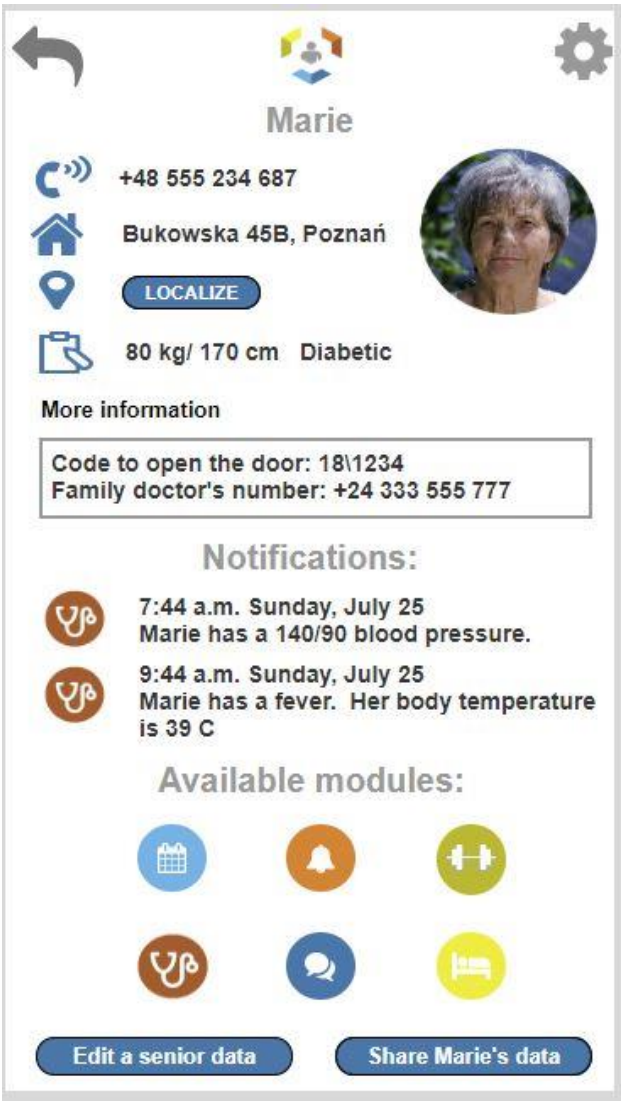

Fig. 25 Caregiver dashboard senior details screen

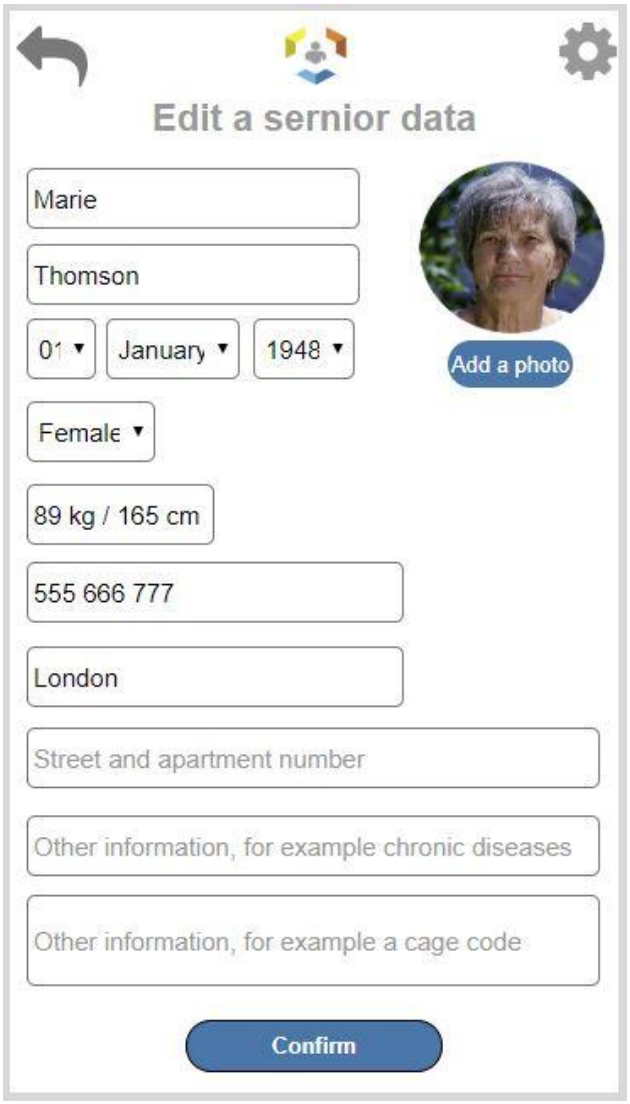

Fig. 26 Caregiver Dashboard edit senior data screen

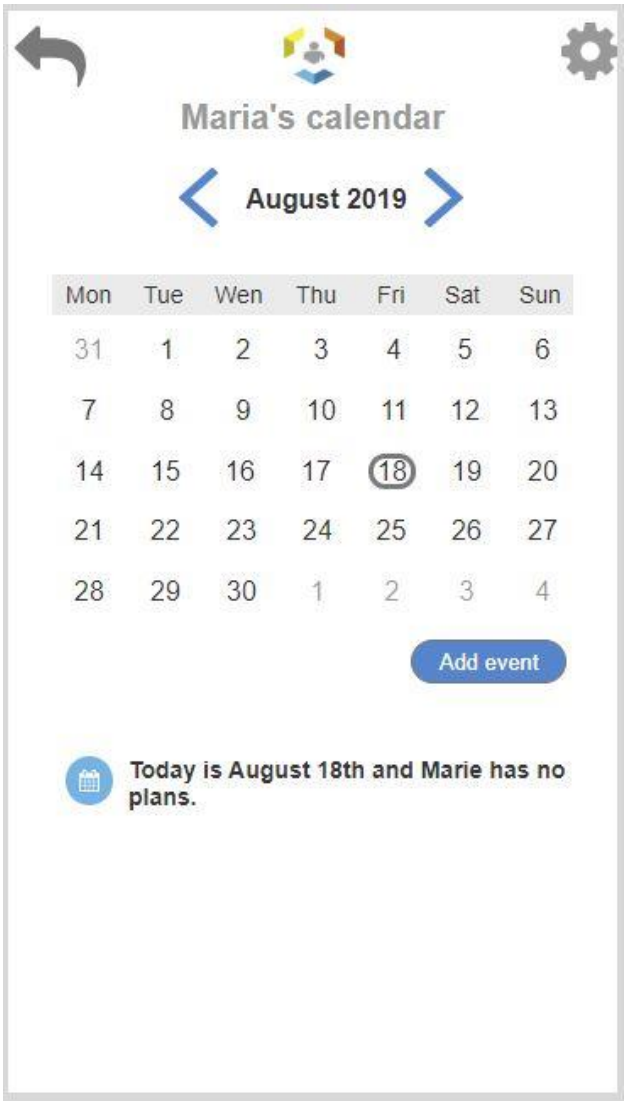

Fig. 27 Caregiver Dashboard senior calendar view screen

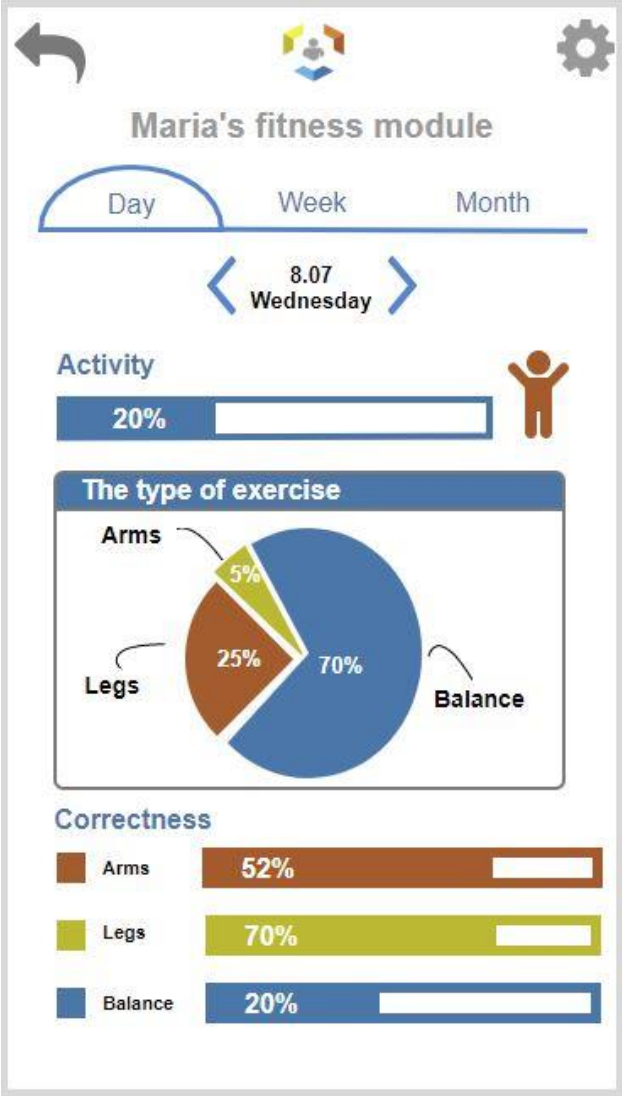

Fig. 28 Caregiver Dashboard Fitness module screen

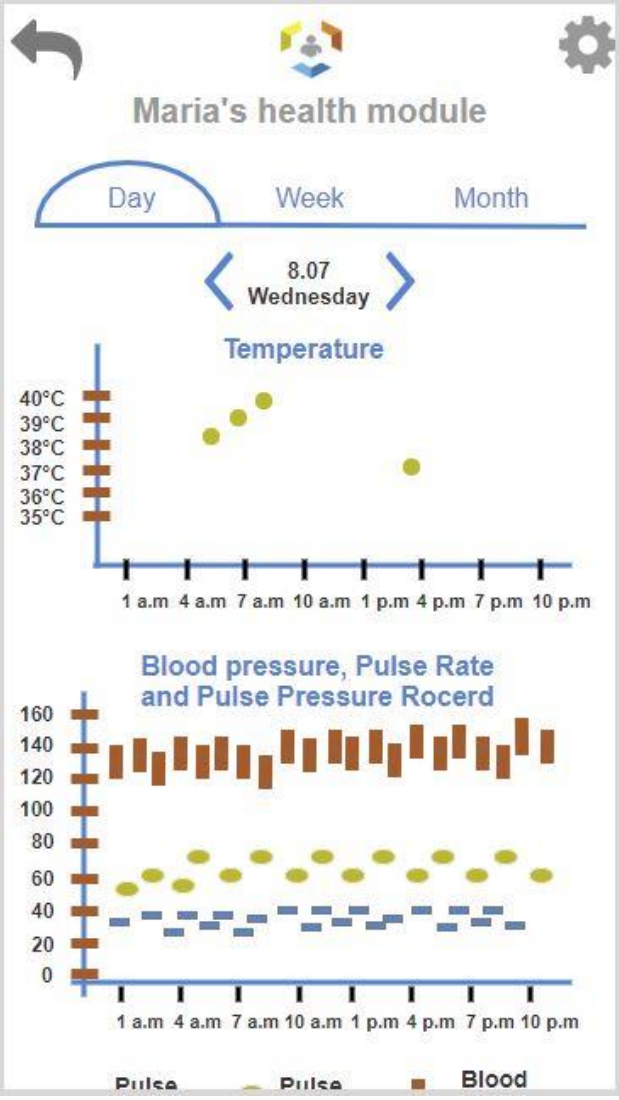

Fig. 29 Caregiver Dashboard Health module screen

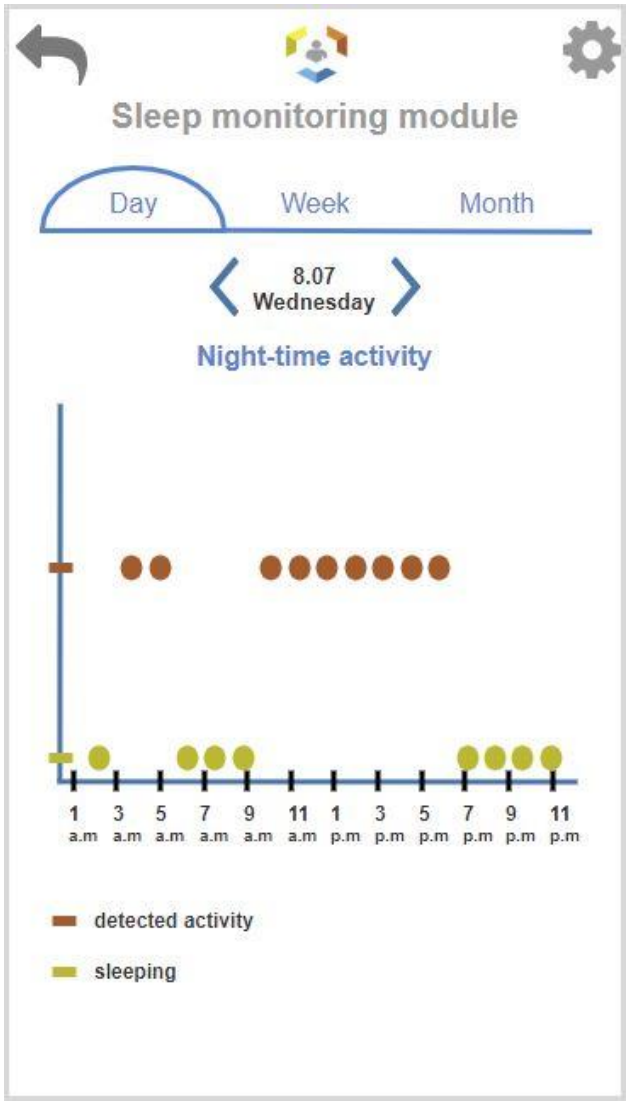

Fig. 30 Caregiver Dashboard Sleep monitoring module screen

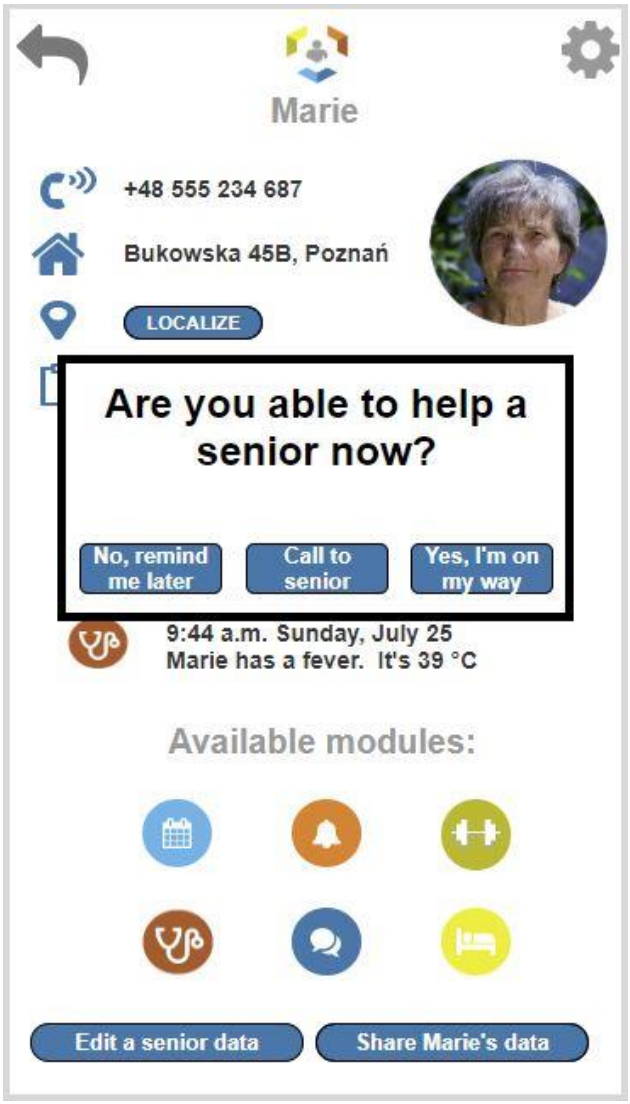

Fig. 31 Caregiver Dashboard Help button dialog screen

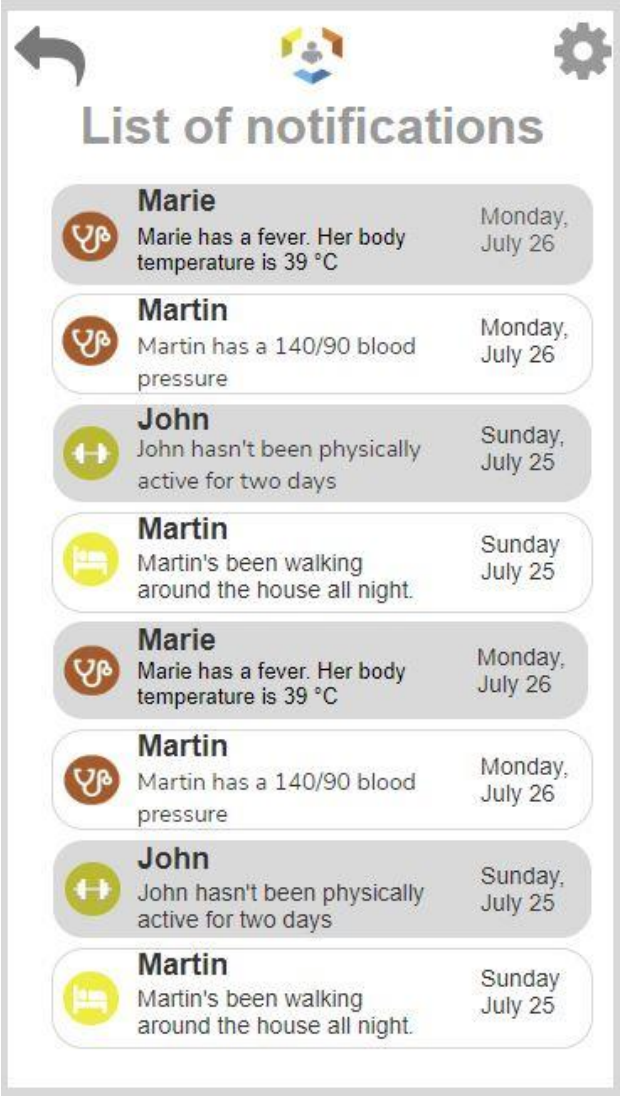

Fig. 32 Caregiver Dashboard notification list screen

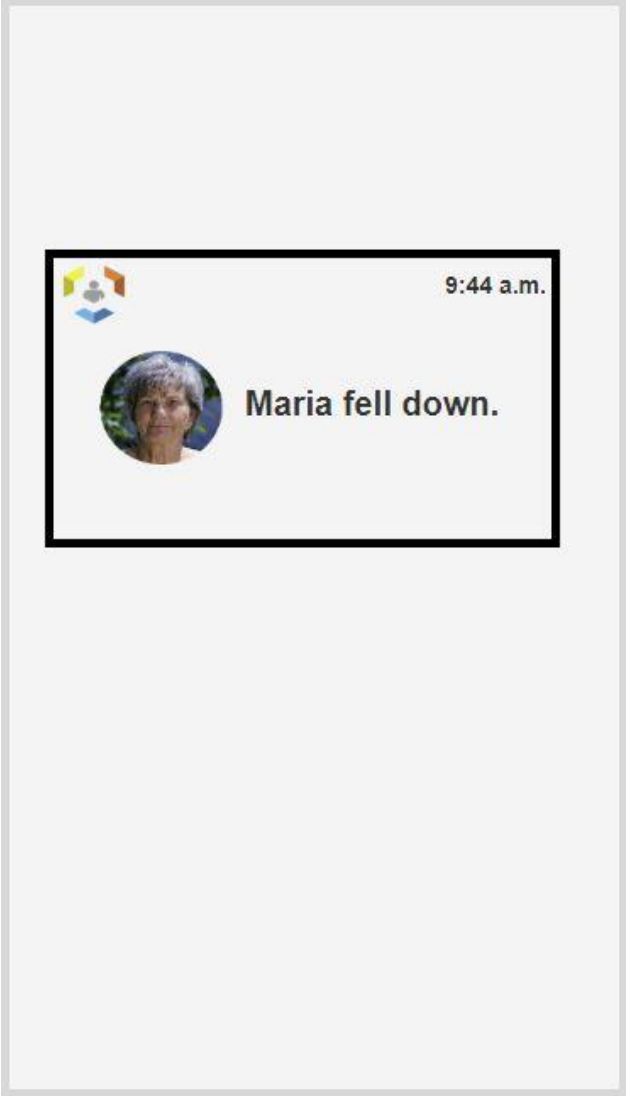

Fig. 33 Caregiver Dashboard Fall detection screen

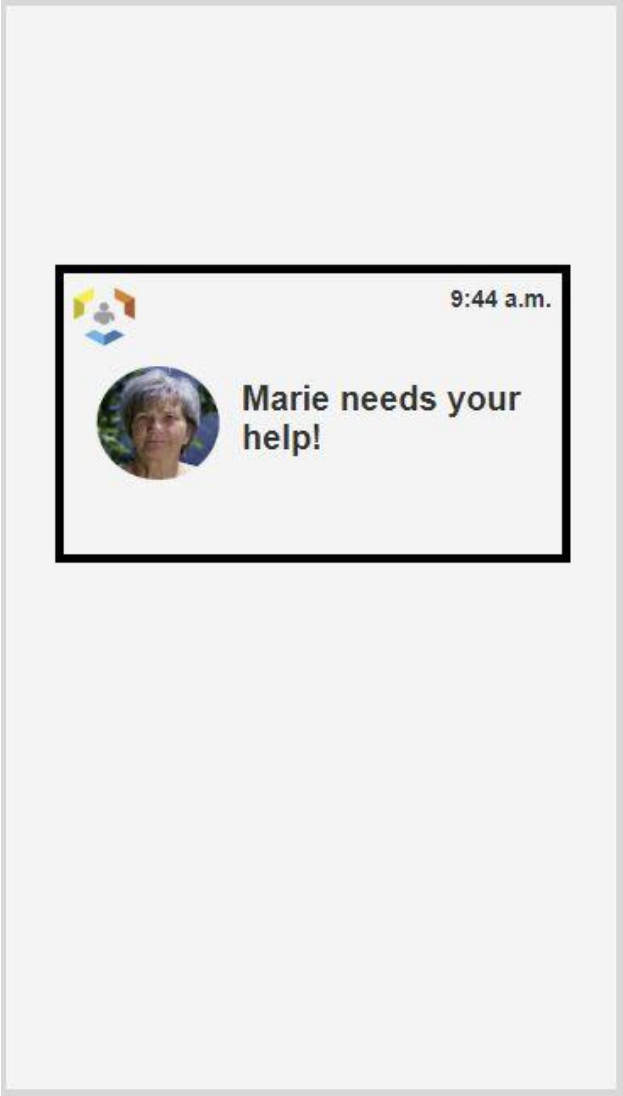

Fig. 34 Caregiver Dashboard Help button notification screen

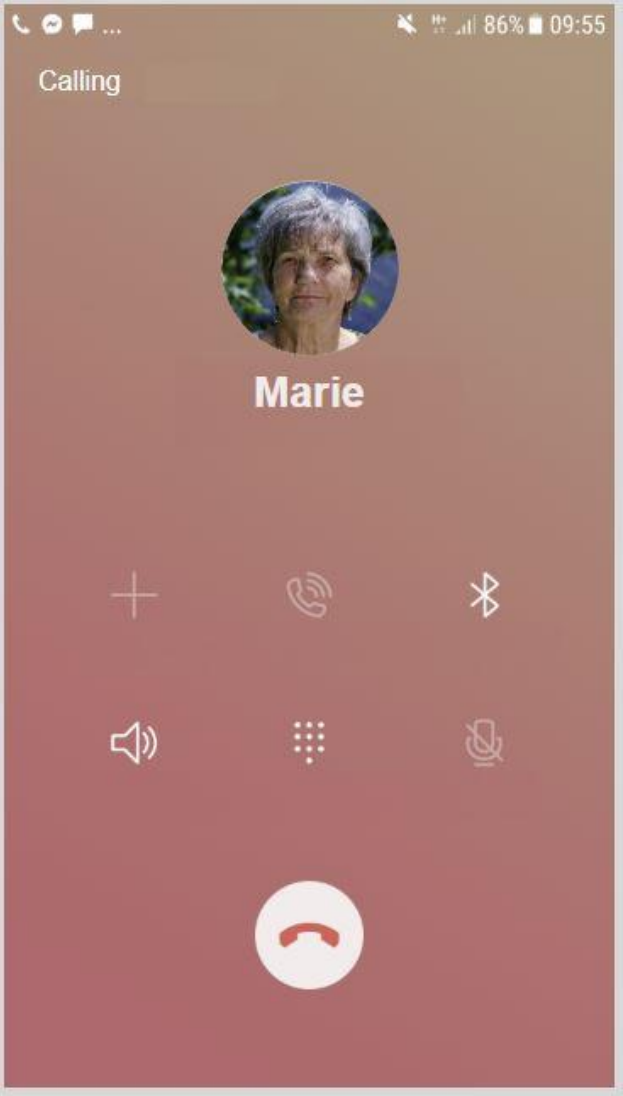

Fig. 35 Caregiver Dashboard call senior screen

3 USER TESTS

The initial mockups presented in the previous section were used to conduct user tests with the target audience. Such a test allows to observe if the target audience can use the mockup with ease and to take note of problems encountered by the target audience when they use the mockup in order to propose a system that is as usable and feature-complete as possible.

3.1 METHODOLOGY

Target audience and participants

The target audience for the system are seniors in loss of autonomy and independence, their informal caregivers and home nurses.

To see the demographic details of the user test, see Annex A.

There were three different scenarios, one for seniors, one for informal caregivers and one for home nurses.

3.1.1 SCENARIO FOR SENIORS

The scenario for seniors was composed of the following 10 tasks:

Task 1:

You open the app for the first time. You need to register in the app.

To do this task, the user needs to create his account in the registration page. So they must click on the register button, fill in the fields with their personal informal and click on register.

Task 2:

You want to be monitored for sleep problems, receive reminders, perform some fitness exercises, have a health condition monitoring and can alarm quickly your caregivers.

To do this task, the user has to choose the right modules in the first page after registering. So they must choose and click on the modules sundown syndrome detection, fitness exercises, blood pressure monitoring and help button. After they must click on submitting. After he must complete each information for each module.

Task 3:

You want to know if this week you have a health problem.

To do this task, the user must click on the health button with the heart icon. After they can see his health information with the pulse, blood pressure, temperature and weight.

Task 4:

You want to start a physical training focused on the arms.

To do this task, the user must click on the fitness button with the balloon icon. After, they must to click on the button “start physical training”, click on the button “arms”. They can see a video with a physical exercise for arms, if he clicks on next he can see another exercise.

Task 5:

You want to call your daughter Marie because it's been a long time since you've talked.

To do this task, the user must click on the communication button with the comic bubble icon, and click on “Call Marie”.

Task 6:

You forget when is your next appointment with your doctor. You want to check in a calendar when is this appointment.

To do this task, the user must click on the calendar button. And they can see all his appointments.

Task 7:

You feel very bad, you want to call your caregiver quickly.

To do this task, the user must click on the help button alarm with the bell icon and click on the button “Yes”.

Task 8:

You want to know if this month you have been stressed.

To do this task, user must be clicking on the health button. And he can see if in his health parameter he thinks has been stressed.

Task 9:

You want to know if this month you did enough exercises.

To do this task, the user must click on the button fitness. He can see his statistic and if he has burned enough calories.

Task 10:

You want to check the condition of the outside air to know if you can open the window.

To do this task, user must click on the air quality button with the leaf icon. He can see information about the air quality and the temperature and humidity of outside.

3.1.2 SCENARIO FOR INFORMAL CAREGIVERS AND HOME NURSES

Our scenario is the same for informal caregivers and home nurse is the same. The only difference is that for informal caregivers there is no task 3.

Task 1:

You open the app for the first time, you want to create an account for yourself.

To do this task, the user needs to create his account in the register page. So he must click on the register button, fill in the fields with his personal informal and click on confirm.

Task 2:

You want to add a new senior who use the PELOSHA system in the app.

New senior information :

Name : Paul Smith

Birth date: 4 May 1937

Male, 70 kg 173 cm

Phone number: 1234455

Address : 22 street liberty, London

Apartment : 3B, 3rd floor

Health problem: Diabetic

To do this task, user must click on the parameter button, click on add a new senior, insert this information and click on confirm.

Task 3:

You want to know if all your patients are fine.

To do this task, the user must observe the home page and can see if a patient has a problem. If a patient has a problem, a red exclamation point is present on the photo.

Task 4:

Marie has a fever. You want to call Marie to know if she is fine and if she needs help.

To do this task, the user must click on the Marie photo, click on appeal button or in the cell icon.

Task 5:

You rang at the door of Marie, but no one answer. You want to know where she is.

To do this task, the user must click on the Marie photo, click on the localize button.

Task 6:

You don’t see physical amelioration for Marie after 2 months of physical exercises. You want to know if Marie does her exercises well.

To do this task, the user must click on the Marie photo, click on the balloon icon. Users can see the graph for the physical exercise done by the senior.

Task 7:

Marie has changed her number phone. Her new number is : 344555633. You want to edit her number phone in the Marie profile.

To do this task, the user must click on the Marie photo, click on the button “edit senior data”. Users must to erase the phone number and replace it with the one given.

Task 8:

You want to change your password for a new more safety password.

To do this task, user must click on the parameter and on “edit an account”. The user fill the field and click on confirm.

Task 9:

Marie has a fever. You want to check her temperature changes during the day.

To do this task, user must click on Marie’s photo, in the heart logo and can see the graph with the changes temperature during the day.

Task 10:

Marie's having sundown syndrome. You want to see if there has been any improvement.

To do this task, user must click on Marie’s photo, in the bed logo and can see the graph with the activity of the senior. If he sleep or he is active during the night.

Task 11:

Go to the page for Sundown Syndrome and wait. You got a notification that Marie needs your help. You want to let Marie know you're on your way.

To do this task, user return in the Sundown syndrome page and wait. A notification appears, user must click on the notification and on the button “I am on my way”.

Task 12:

Marie told you that she had forgotten to go to the doctor. You want to see what modules Marie has currently active and see if there is a calendar module.

To do this task, user must click on Marie’s photo, in the calendar icon.

Task 13:

You are in holiday for one week. You want to send Marie's information to your replacement. The e-mail address of the nurse you want to share this with is: anna@gmail.com

To do this task, user must click on Marie's photo, in the button "Share Marie's data".

Task 14:

Yesterday you were very busy. You want to check the list of notifications to be sure that you've seen all the information.

To do this task, user must click on the button "list of notification". He can see all the notifications.

Task 15:

You want to quit the app.

To do this task, user must click on the button on/off and on "yes".

3.1.3 MOCKUPS

The mockups presented in the previous section have been used for performing the test with the three user groups. The seniors were interacting with the mockups meant for them on a tablet, whereas the informal caregivers and home nurses were using a smartphone. The texts in the mockups have been translated into the national languages of the users, i.e. Swiss German, Flemish and French.

3.1.4 PROCEDURE

Users performed the test on the tablet for older people and on smartphones for home nurses and informal caregivers.

To perform the user test, after welcoming the users, the purpose of the project PELOSHA is explained to them. Users sign the consent form (see Appendix B) and agree that the test should be audio recorded and anonymized. After having obtained their agreement, we start the handover.

User-Test Procedure:

To start the test, the audio recording of the test was started. We began by asking demographic questions, such as the person's age, level of experience in new technologies (see Appendix C). We explained to the user that they were going to be asked to do tasks on the mockup, to express aloud what they were doing, and not to hesitate to say if they didn't arrive, that it wasn't their fault but ours was to improve the mockup. Then we would start the screen recording and launch the mock-up on the registration page. We then presented the tasks to the user one by one. The task was read to him orally and then given written instructions. The user had to try to find the information requested by the task by thinking about verbalizing. Once the user thinks he has solved the task, the user is asked to return to the home page and then given instructions for the second task and so on.

Post-Test interview:

After completing the tasks the user had to complete a questionnaire, the System Usability Scale (SUS). It is a scale created by John Brooke in 1986, it provides a "quick and dirty", reliable tool for measuring the

usability. It consists of a 10 item questionnaire with five response options for respondents; from Strongly agree to Strongly disagree (see Appendix D).

Finally, we asked to the users what they thought about the app, it is easy to use, did they have problems using it or doing tasks, do they use it.

3.2 RESULTS

3.2.1 GENERAL RESULTS

The test results are presented in the below tables.

Table 1 Results of the user test for seniors

	Task 1	Task 2	Task 3	Task 4
time taken by S1Ge to complete the task	426 sec	259.8 sec	240 sec	258 sec
time taken by S2Ge to complete the task	123 sec	-	151 sec	90 sec
time taken by S3Ge to complete the task	60 sec	-	141 sec	149 sec
time taken by TP CH1 to complete the task	300 sec	215 sec	3 sec	17 sec
time taken by TP CH2 to complete the task	240 sec	78 sec	10 sec	12 sec
time taken by TP CH3 to complete	170 sec	154 sec	4 sec	5 sec

the task				
time taken by TP CH4 to complete the task	150 sec	176 sec	3 sec	3 sec
Average time taken to complete the task	209,9 sec	103,8 sec	78,9 sec	76,3 sec
General description of the problems	• tried to enter the platform directly without creating an account • did not complete all the boxes in the registration process • difficulties to get back on the line • problems selecting • test person clicks immediately on "register"	• Difficulty to identify logo for : fitness module and air quality • Lack of clarity regarding the functionality of sunset syndrome detection • S3GE doesn't click on submit • Sleeping monitoring wasn't found at all. • To find "reminder" at once she clicks on the calendar	S1Ge first went to the calendar module, then "back in shape" and finally the « health » module	• Video is too fast for seniors. • Starts exercises – arms; but the program begins with exercises for the legs!

	Task 5	**Task 6**	**Task 7**	**Task 8**	**Task 9**	**Task 10**
time taken by S1Ge to complete the task	60 sec	50 sec	58 sec	40 sec	60 sec	220 sec
time taken by S2Ge to complete the task	-	60 sec	51 sec	-	60 sec	91 sec
time taken by S3Ge to complete the task	91 sec	256 sec	90 sec	30 sec	-	342 sec
time taken by TP CH1	5 sec	1 sec	1 sec	1 sec	4 sec	10 sec

to complete the task						
time taken by TP CH2 to complete the task	8 sec	1 sec	1 sec	1 sec	2 sec	2 sec
time taken by TP CH3 to complete the task	2 sec	1 sec	1 sec	10 sec	10 sec	3 sec
time taken by TP CH4 to complete the task	12 sec	1 sec	1 sec	4 sec	4 sec	6 sec
Average time taken to complete the task	25,4 sec	52,9 sec	29 sec	12,3 sec	20 sec	96,3 sec
General description of the problems	-	-	-	-	-	-

Table 2 Results of the user tests for home nurses

	Task 1	Task 2	Task 3	Task 4	Task 5
time taken by HN1Ge to complete the task	-	-	-	-	-
time taken by HN2Ge to complete the task	120	158	42	150	49
time taken by HN3Ge to complete the	90	125	35	5	18

task					
time taken by HN4Ge to complete the task	214	258	48	-	-
time taken by HN5Ge to complete the task	186	144	-	120	2
time taken by HN1BE to complete the task	120	136	30	65	30
time taken by HN2BE to complete the task	85	155	10	29	10
time taken by HN3BE to complete the task	60	120	5	10	20
time taken by HN4BE to complete the task	120	120	10	25	20
time taken by HN5BE to complete the task	60	60	10	25	15
Average time taken to complete the task	117,2	141,7	23,7	53,6	20,5
General description of the problems	• when the user click on confirm -> return in the registration page or open	• He searches in the right direction, however, the gears are not clear enough • He had to	only looks at the home page she doesn't go in all notification.		HN5Ge doesn't see the localization

	the app	search for a while, the "gears" don't seem clear enough. When he found the gears, it was difficult to click on it because it is close to the off button			

	Task 6	Task 7	Task 8	Task 9	Task 10
time taken by HN1Ge to complete the task	-	-	-	-	-
time taken by HN2Ge to complete the task	48	33	41	16	91
time taken by HN3Ge to complete the task	50	15	35	22	12
time taken by HN4Ge to complete the task	144	180	220	50	180
time taken by HN5Ge to complete the task	-	5	-	-	-
time taken by HN1BE to complete the task	25	10	60	30	25
time taken by HN2BE to complete the task	45	10	40	10	10
time taken by HN3BE to complete the task	8	75	5	15	8
time taken by HN4BE to complete	15	75	30	15	16

the task					
time taken by HN5BE to complete the task	19	75	30	11	8
Average time taken to complete the task	44,2	53, 1	57,6	21,1	43,7
General description of the problems	• Icon not clear • Doesn't understand physical activity graph.		Doesn't see parameters quickly. He returns to the login page.	Logo not clear	

	Task 11	**Task 12**	**Task 13**	**Task 14**	**Task 15**
time taken by HN1Ge to complete the task	-	-	-	-	-
time taken by HN2Ge to complete the task	-	43	38	62	4
time taken by HN3Ge to complete the task	10	58	15	2	10
time taken by HN4Ge to complete the task	10	50	18	30	10
time taken by HN5Ge to complete the task	-	-	-	-	-
time taken by HN1BE to complete the task	10	25	15	10	4
time taken by HN2BE to complete the task	15	25	15	10	5
time taken by HN3BE to complete the task	7	10	10	6	5
time taken by HN4BE to complete the task	7	15	35	50	10
time taken by HN5BE to complete the task	7	15	23	5	6
Average time taken to complete the task	9,4	30,1	21,1	21,8	6,7

General description of the problems	doesn't think to click in the notification	Doesn't see the logo is too small			He clicks on the home button on my phone

Table 3 Results of the user tests for informal caregivers

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
time taken by IC1Ge to complete the task	492	420	39	34	90	37	21
time taken by IC2Ge to complete the task	200	140	75	75	82	20	41
time taken by IC3Ge to complete the task	360	419	120	30	-	230	65
time taken by IC4Ge to complete the task	179	220	12	91	114	103	22
Average time taken to complete the task	307,7	299,7	61,5	57,5	95,3	97,5	37,2
General description of the problems	• Try to insert identification information, then she clicks on registration • doesn't understand what is the box that are not filled out • Doesn't know what does	Click on parameters but the logo is small.	-	-	Logo is not clear	-	-

	after is confirmed. It's not logical for her to click on return						

	Task 8	Task 9	Task 10	Task 11	Task 12	Task 13	Task 14
time taken by IC1Ge to complete the task	35	30	-	10	10	10	10
time taken by IC2Ge to complete the task	60	80	10	36	10	10	10
time taken by IC3Ge to complete the task	120	-	15	10	64	90	10
time taken by IC4Ge to complete the task	135	85	34	36	26	58	10
Average time taken to complete the task	87,5	65	19,7	23	27,5	42	10
General description of the problems	Logo is not clear	-	-	-	-	-	-

3.2.2 DETAILED DESCRIPTION OF USER PROBLEMS

1. Registration

A lot of users make the same error. They insert their login in the registration page and after that they click on "register". Some users don't know if they have to click "log in" or "register".

Another solution should maybe be found to highlight where the user can click to create his account.

We can maybe change the design of the registration page, adding an underlined link under the user boxes, with the caption "create my account". This way, the only button in the page would be the "log in" button.

Another problem for some is to understand which field was not filled correctly. They see that a field is incorrect but don't understand which one. Maybe the field could be highlighted.

In general the registration can be difficult for seniors, the informal caregivers may be the ones who will have to do this part.

2. Font sizes too low

The mockups for informal caregivers and home nurses generally have too small fonts. The users frequently said “oh, that’s too small”, or failed to find some button or icon.

The text font sizes, buttons and icons should be enlarged.

3. Unclear symbols

Two symbols are not clear for a lot of the users in the mockup for informal caregivers and home nurses - the heart symbol and the balloon symbol. A lot of users can’t find where the physical activity module because they don’t understand its symbol. For the heart symbol, some users think it’s only to see the pulse, they don’t think is to see health information in general.

Therefore, the fitness and health modules symbols should be changed to something more obvious.

In the mockup for seniors, the symbols that were not clear were the fitness and air quality symbols.

4. Graph for physical activity unclear

Some users didn’t understand the graph for physical activity in the mockup for informal caregivers and home nurses. They could not tell what the percentage means or what was the difference between the two graphs.

5. Health graph

A user didn’t understand the second graph in the health module, because she didn't see that you had to go down to see the legend and the back button.

Having to scroll to see all the information should be avoided.

6. Sundown syndrome name

Only one in five nurses in Geneva knew what sundown syndrome is, and none of the informal caregivers or seniors did. Another name for this module needs to be found.

3.2.3 IMPROVEMENT SUGGESTIONS

During the moskup tests, the users provided some comments on potential areas of improvement.

For the mockup for seniors:

- Put a red exclamation mark behind abnormal data instead of a green checkmark
- Add an alarm bell
- Video is too fast for seniors. Maybe add different rhythm.
- Project the video on a larger screen (e.g. TV)
- Add statistics in physical activity for shorter periods than one month, like for the week or the day.
- Add a possibility to send text messages.
- Add a clock or the written time. Maybe remove the header.
- Only IC and HN can edit the calendar for some senior
- Add more options : calendar for day, week and month.
- More information with symbols (image of season, months etc.)
- More complete with the external condition type
- Add alarm if air quality is not good
- OZON is lacking

- Writing a personal diary “to remember life’s highlights and good memories” (Maybe can write to the tablet with a pencil (like apple pencil))
- Provide a list of associations for senior citizens existing in the area
- Integrate a reward/feedback system to encourage people to be active
- Reminder message to encourage people to practice activities
- Add alimentation hydration
- 2 reminders lists : for appointment reminders and people’s physiological needs
- Add a daily program
- Add audio recall with the day program
- Add module memory with photo of the senior’s relative, localization he likes, etc.
- Add cognitive activity like crossword
- Add cooking recipes
- Add news on current traffic

For the mockup for home nurse:

- Access in the app with fingerprint
- Can visualize when a notification is resolved (Red when is not resolved and green when is resolved)
- Have a distinction by day for the notification
- Put information on health , phone number of informal caregivers, medication list and illness elsewhere on a 2nd page
- Add doctor numbers
- Add more information : name of the physio, doctor, assurance number, building code
- HN like the idea to can add appointment for seniors, reminders and can see the appointment of the senior
- If the HN cannot go who receives the notification? Other nurse, Informal Caregiver?
- Also show why the senior needs help
- Add more information
- Add notes in the app. Can note information for other home nurses, informal caregivers, doctor, etc.
- GPS in a smartphone is a bad idea. Senior doesn’t think to take with him. Maybe a medallion
- Calendar doesn’t work
- Recall in the senior’s watch

For the mockup for informal caregivers:

- When IC clicks on a notification -> he is redirected un the corresponding module page
- Add possibility to send an alarm to the senior
- Add recall for seniors
- For another population ? Like children with oncologic problems
- Add hydration

- Add diabetic measure in the app
- Add home nurse's note in the tablet
- Possibility to fill in a list of things done and to be done by the day, week

3.2.4 RESULTS FOR THE POST-TEST EVALUATION

SUS Means for Informal Caregivers: 71.7

Good system

SUS Means for Home Nurses: 85.6

Excellent system

SUS Means for Seniors: 91.7

Excellent system

3.2.5 RESULTS FOR THE CARD SORTING

We have several white cards with names of "modules" or "functionalities" into which the PELOSHA system will be structured.

The bigger pink cards carry designations for areas of life to which you can associate the functionalities.

We ask to user to assign each white card to a pink card, just as they think they belong together.

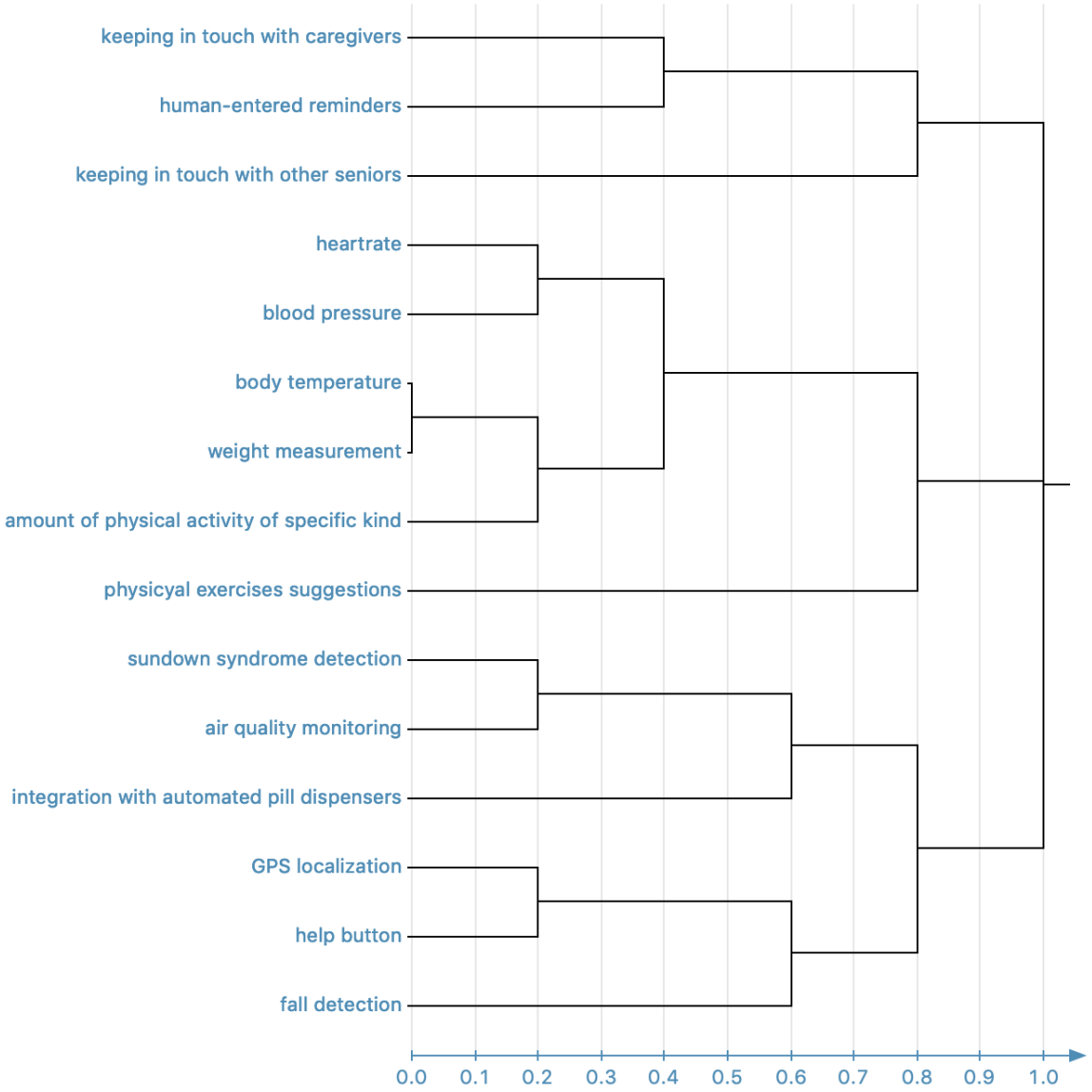

Fig. 36 Card sorting dendrogram for home nurses

We can see keeping in touch with caregivers and human entered reminders are often assign together with keeping in touch with other seniors in the category connectedness.

We observe heartrate, blood pressure, body temperature, weight measurement, amount of physical activity and physical exercise are often assign in the category health overview.

We observe sundown syndrome, air quality monitoring and integration with automated pill dispensers are often in the category quality of life.

GPS localization, help button and fall detection are often assign in the category safety.

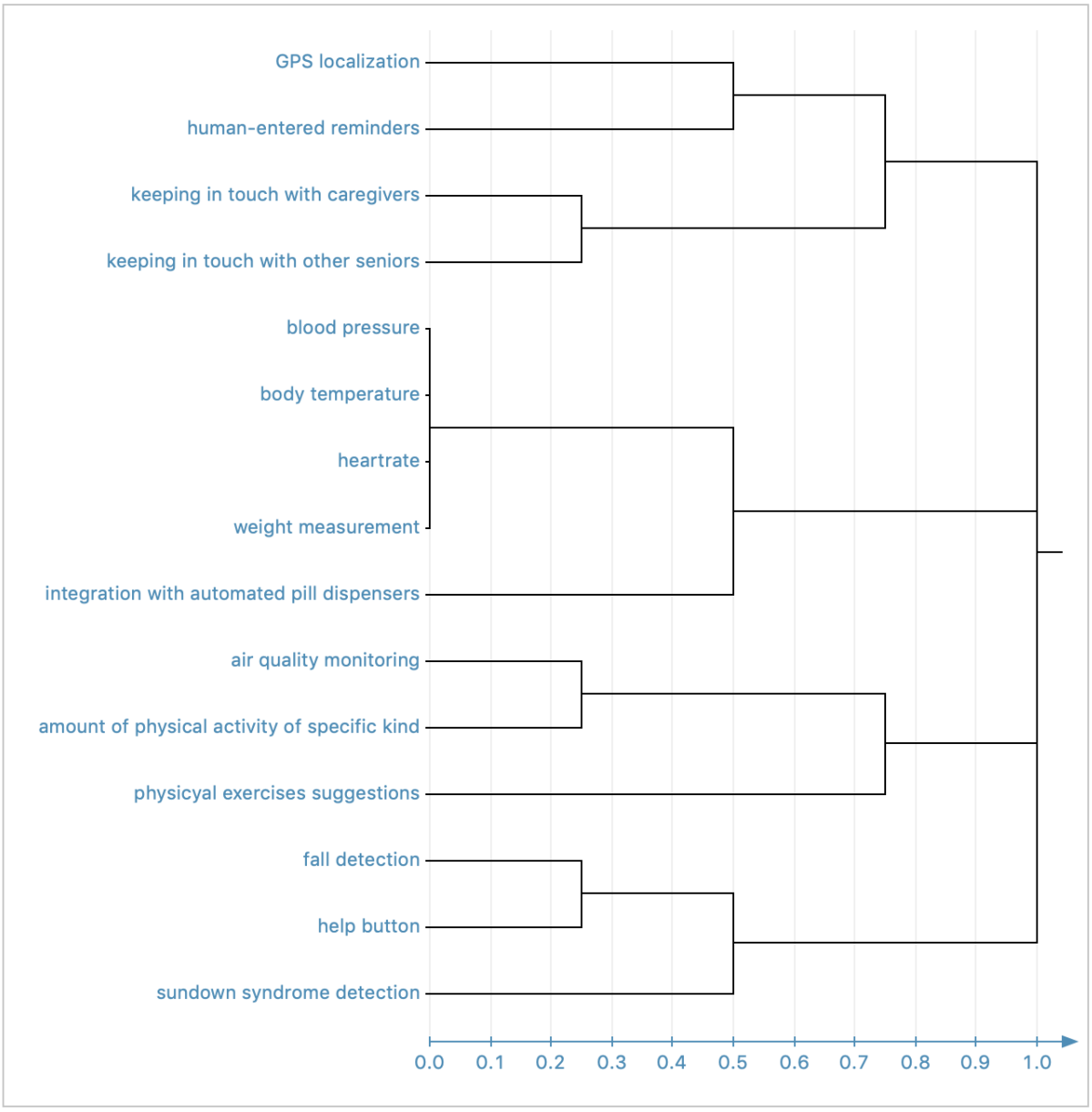

Fig. 37 Dendrogram for seniors

GPS localization, human-entered reminders, keeping in touch with caregivers, keeping in touch with other seniors are often assign together in the category connectedness.

Blood pressure, body temperature, heartrate, weight measurement and integration with automated pill dispensers are often assign together in the category health overview.

We can observe that air quality monitoring , amount of physical activity of specific kind and physical exercises suggestions are often assign together in the category quality of life.

Fall detection, help button and sundown syndrome detection are often assign in the category safety.

4 UPDATED UI

Based on the above findings from user testing sessions, a new version of mockups was created. Basing on this version, the UI design is undergoing continuous development with the inclusion of module creators, end-user organisations, and end users who participate in smaller-scale tests (partly performed in a remote manner due to sanitary regulations related with the COVID-19 pandemic). The current version of the UI screens (which is bound to undergo further changes, due to the nature of the continuous user involvement process) is presented below.

4.1 UI SCREENS FOR THE PELOSHA ASSISTANT

As established during previous user interviews, the PELOSHA Assistant used by seniors is envisioned to run on a tablet device – this is reflected in the mockups.

Fig. 38 PELOSHA Assistant welcome screen

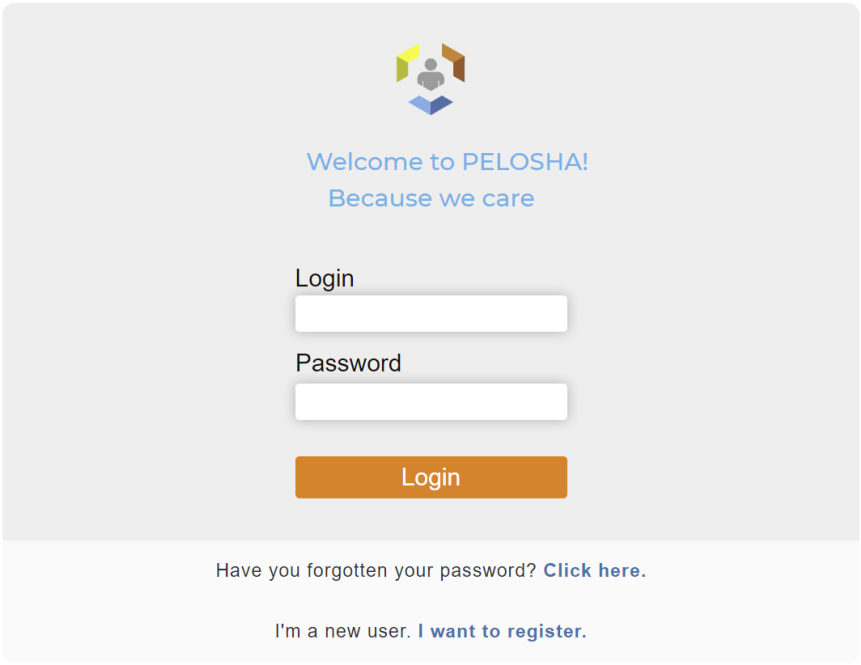

Fig. 39 PELOSHA Assistant login screen

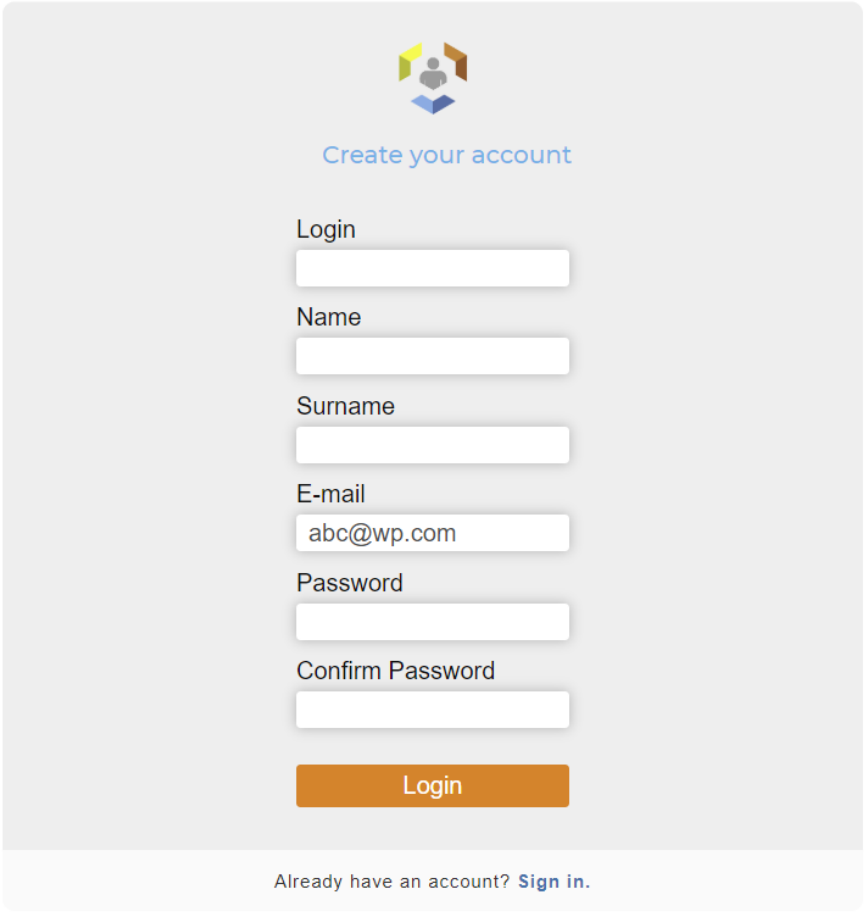

Fig. 40 PELOSHA Assistant registration screen

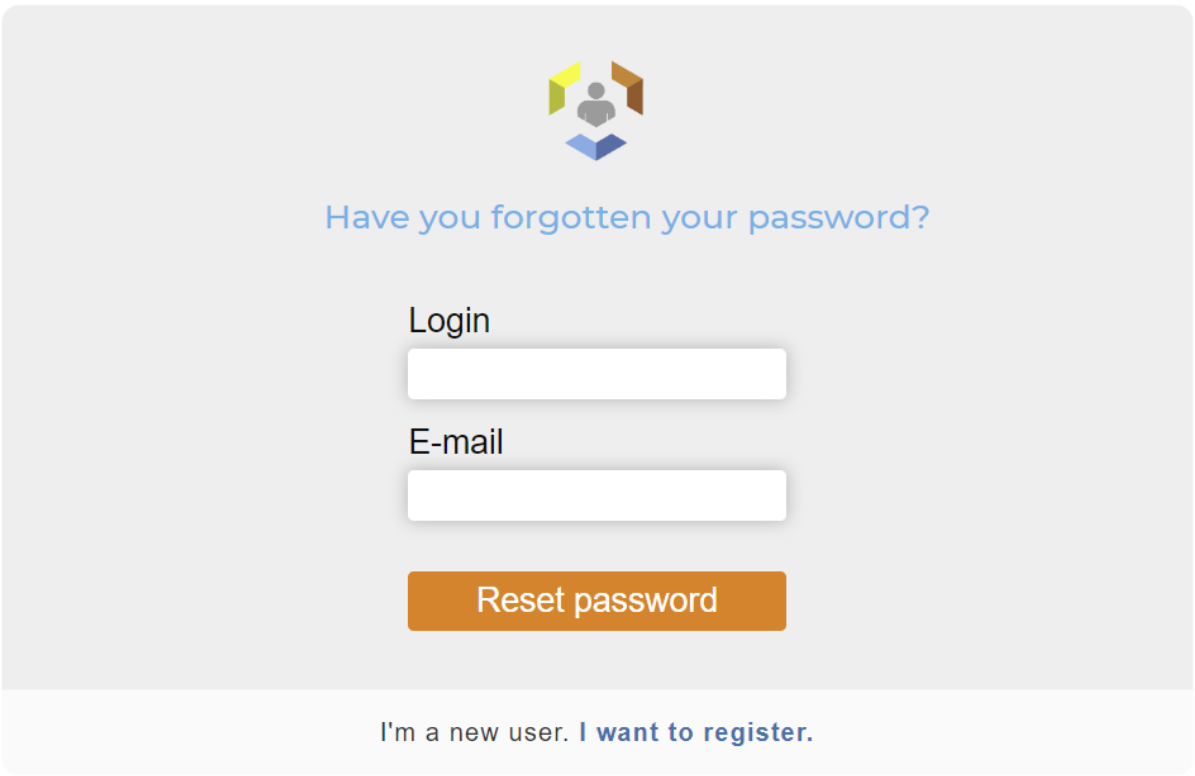

Fig. 41 PELOSHA Assistant password reset screen

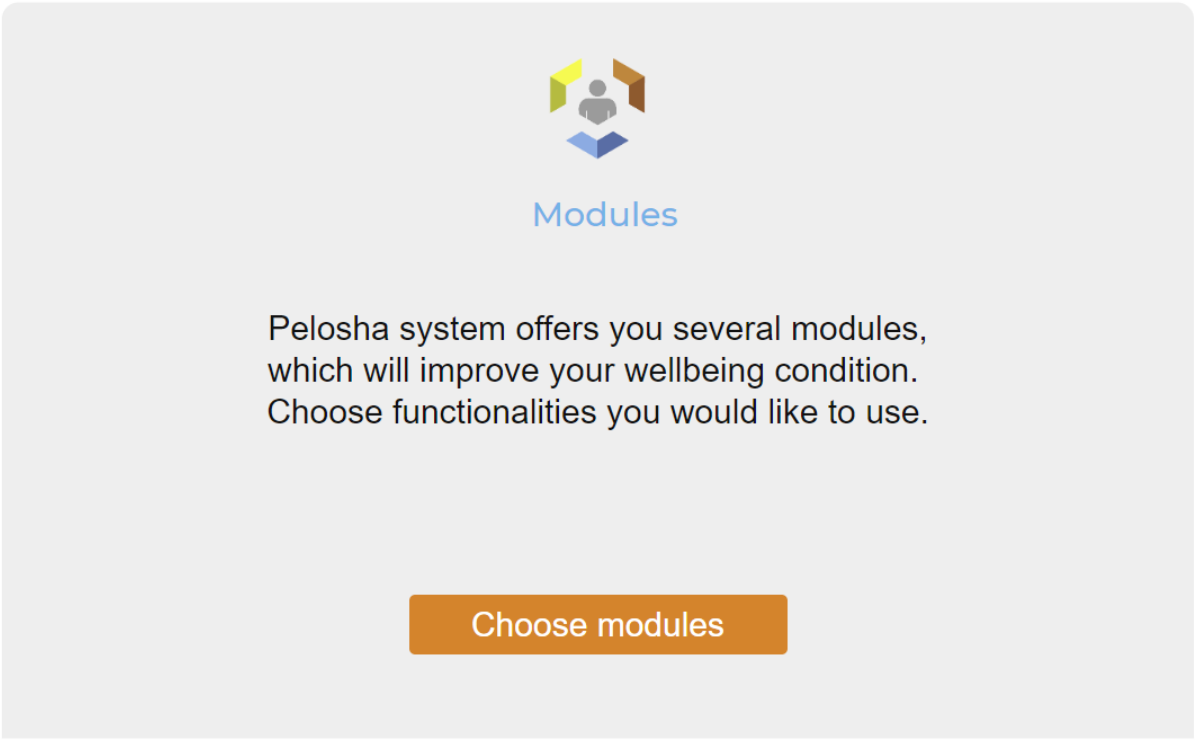

Fig. 42PELOSHA Assistant module select explanation screen

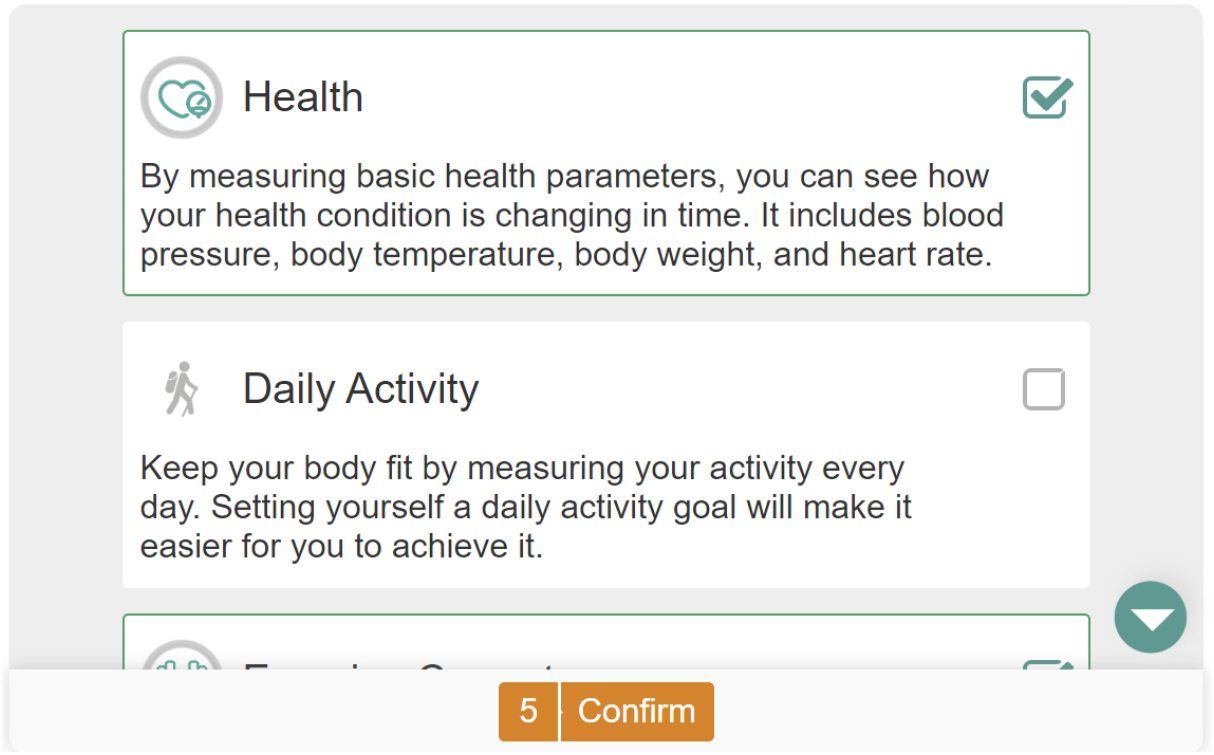

Fig. 43 PELOSHA Assistant module select screen

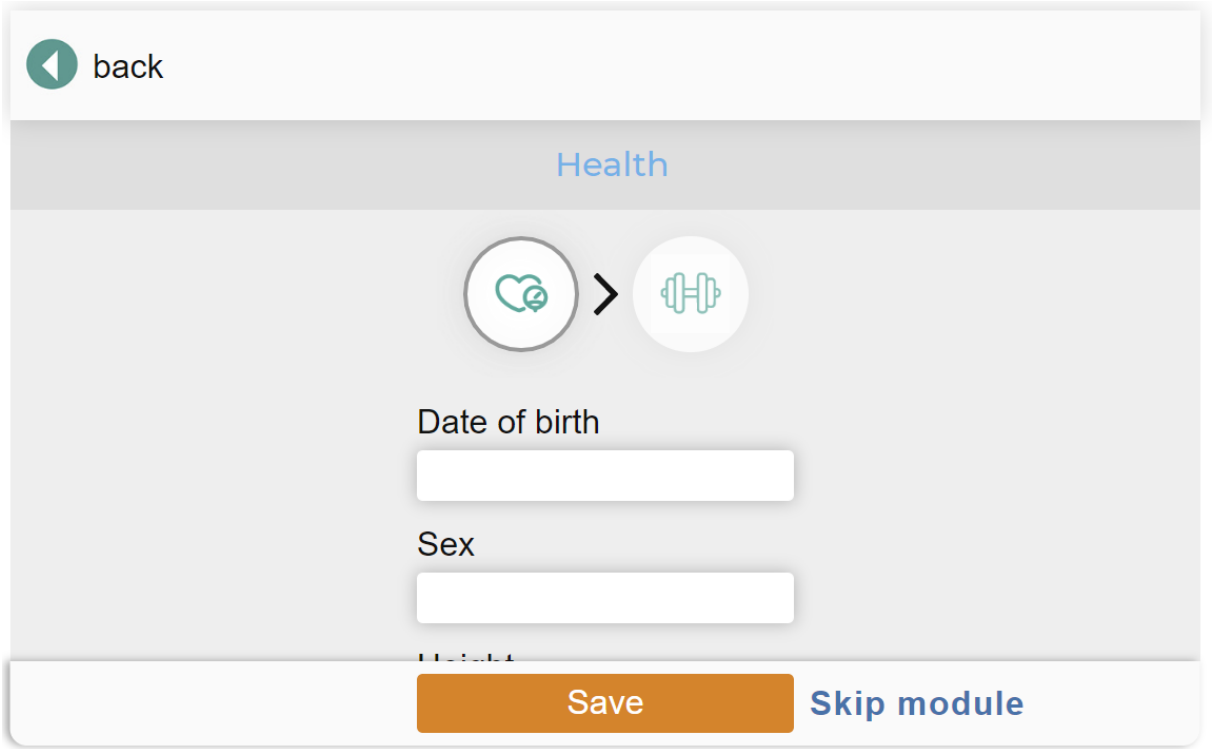

Fig. 44 PELOSHA Assistant Health module settings screen

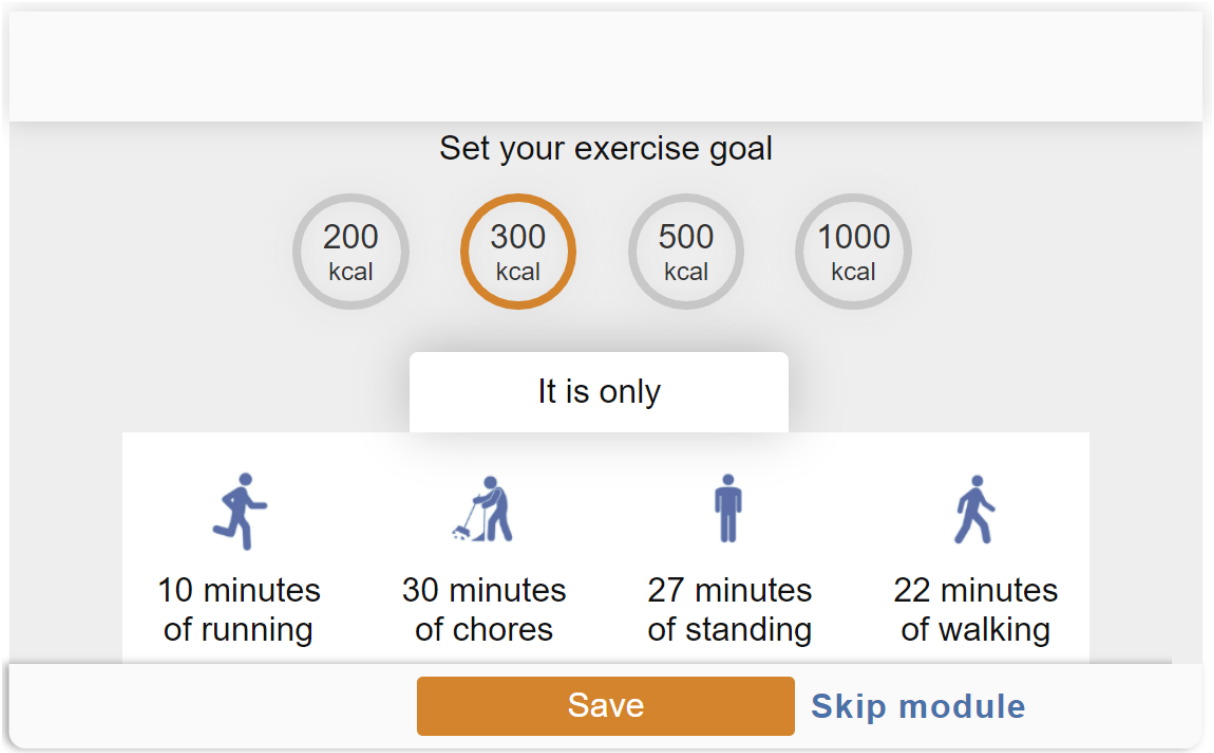

Fig. 45 PELOSHA Assistant Fitness module settings screen

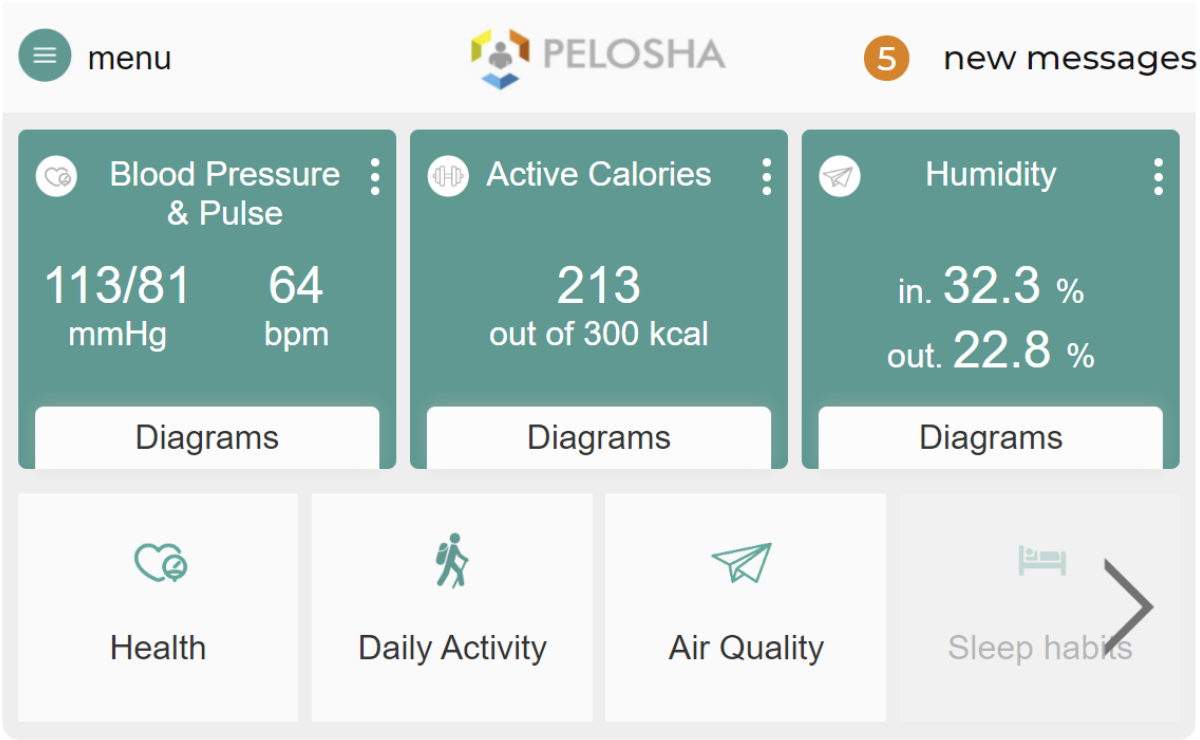

Fig. 46 PELOSHA Assistant dashboard screen

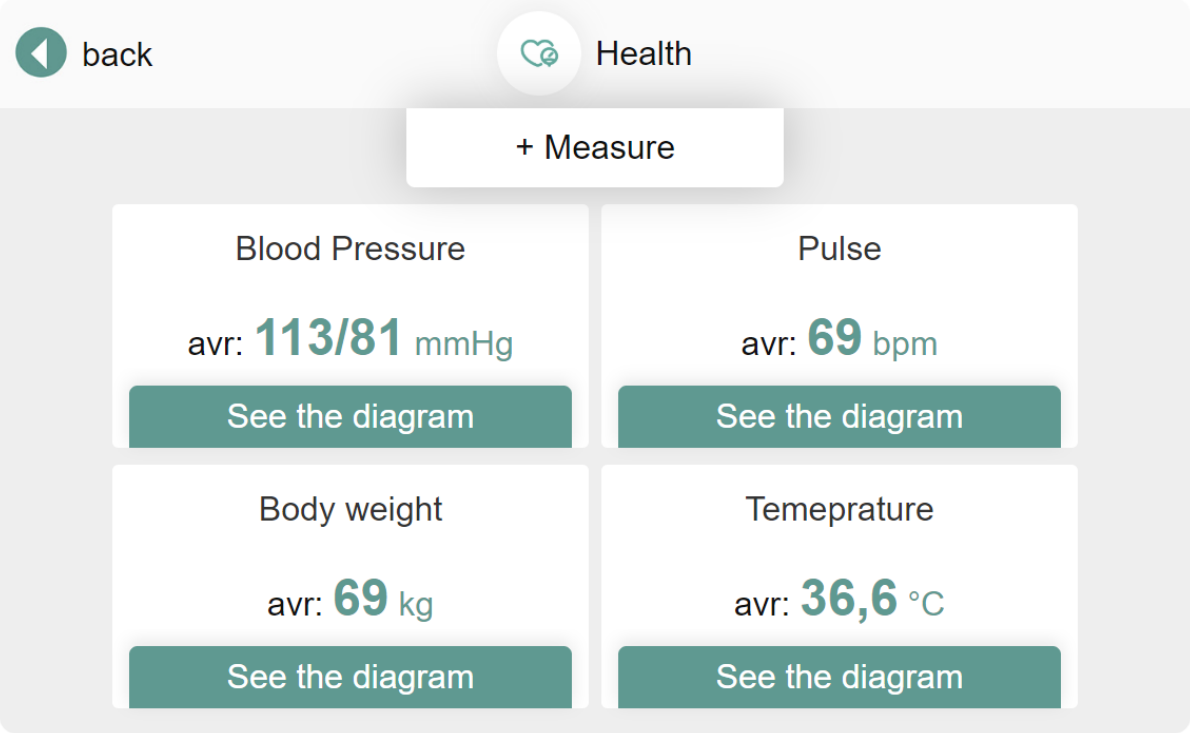

Fig. 47 PELOSHA Assistant Health module screen

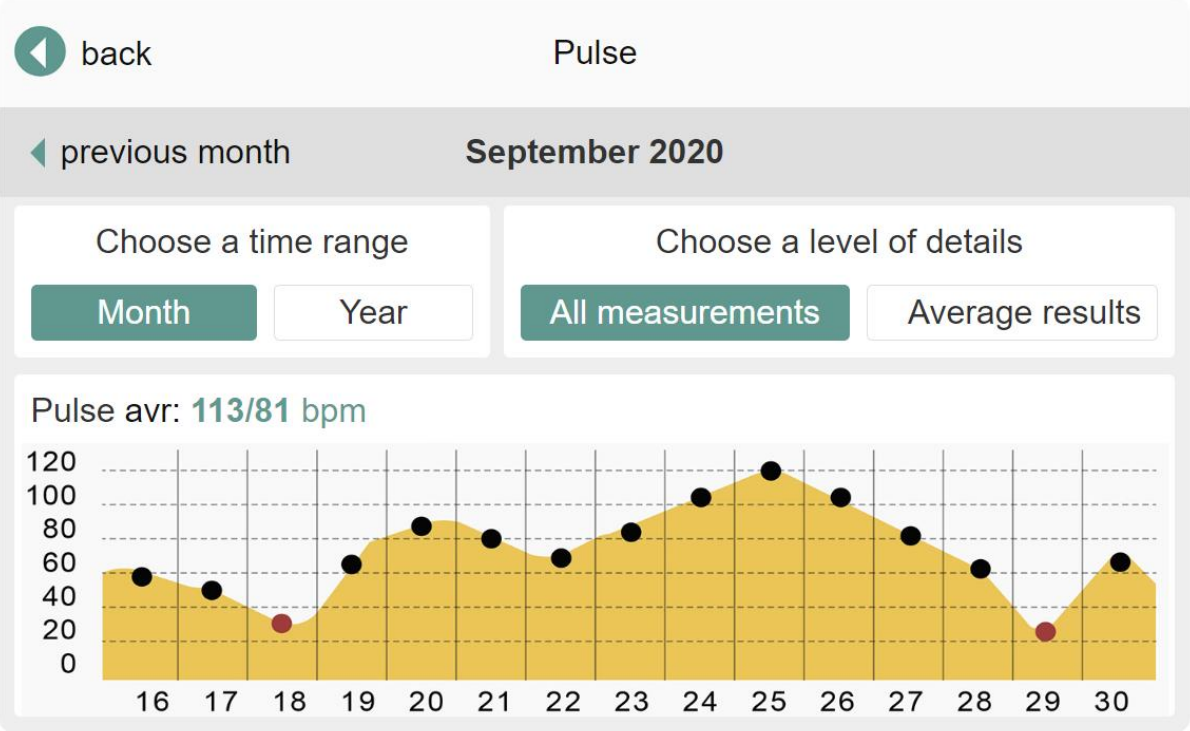

Fig. 48 PELOSHA Assistant pulse data screen

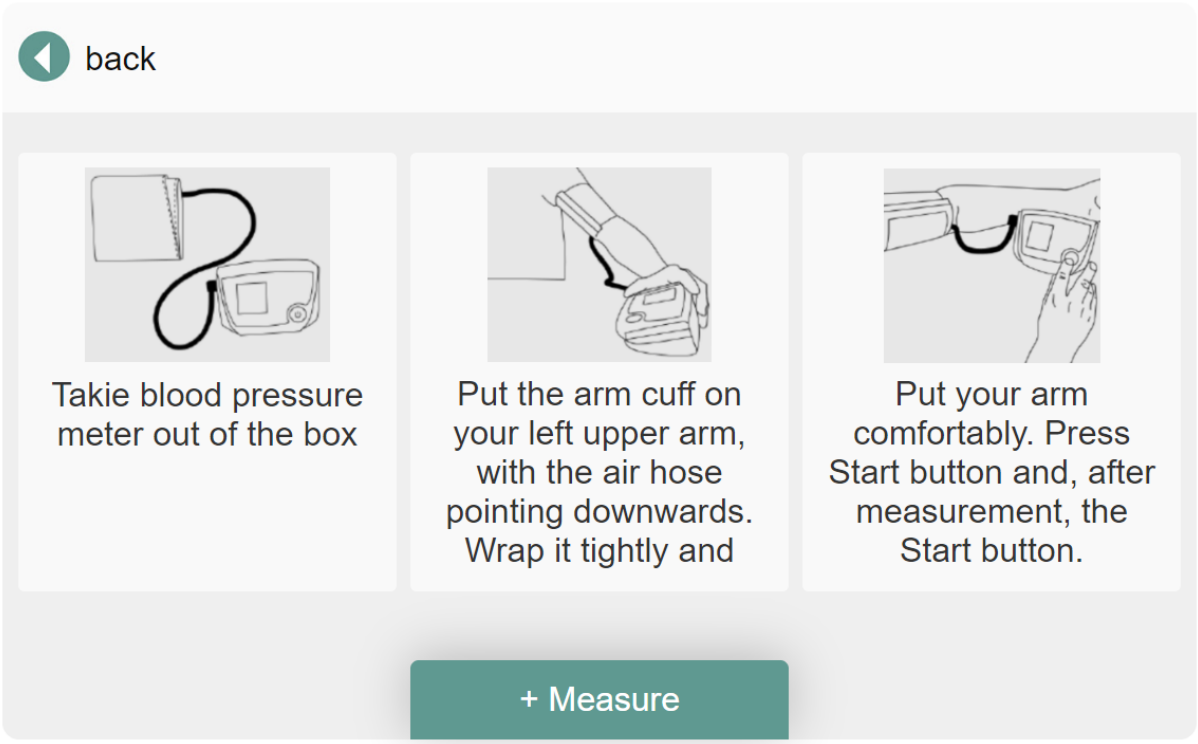

Fig. 49 PELOSHA Assistant blood pressure measurement screen

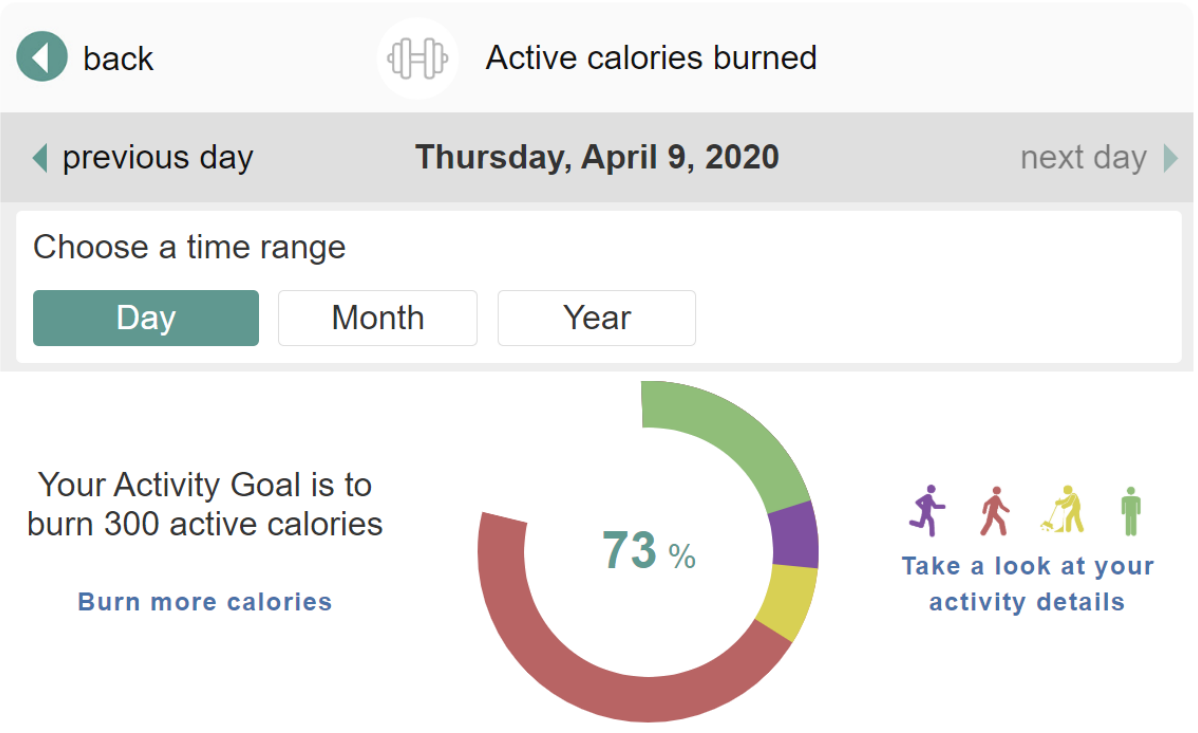

Fig. 50 PELOSHA Assistant activity goal screen

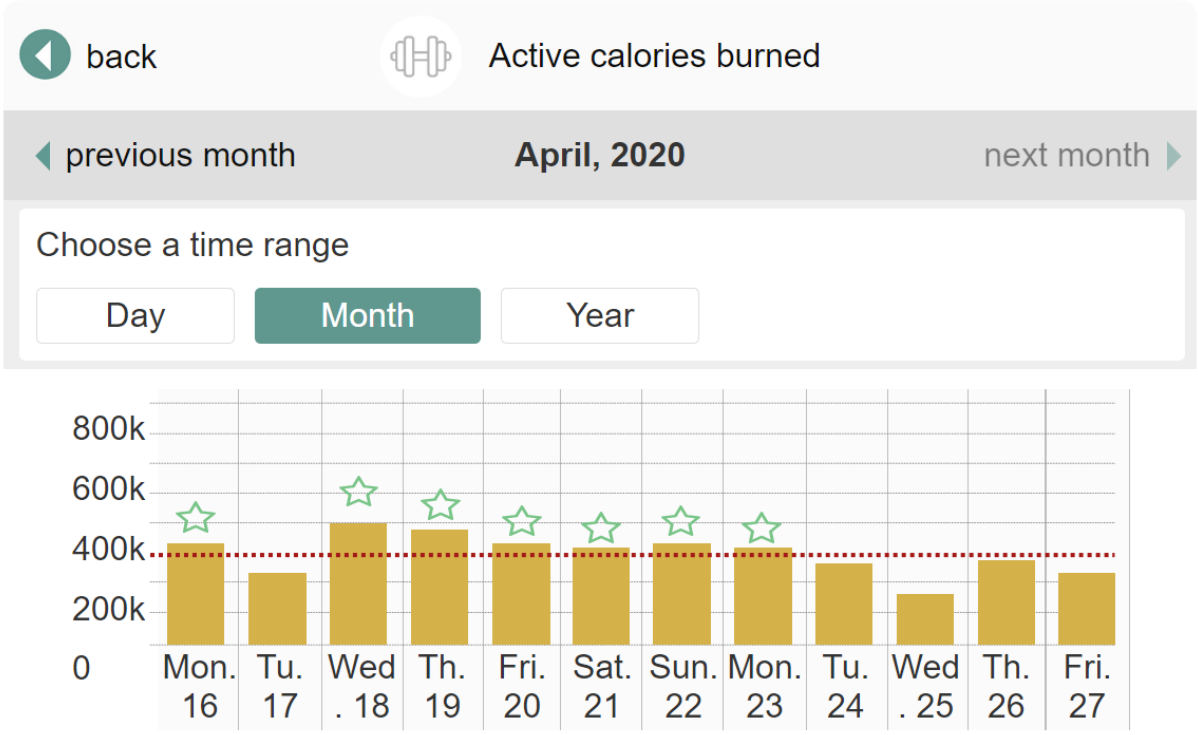

Fig. 51 PELOSHA Assistant activity measurement monthly data screen

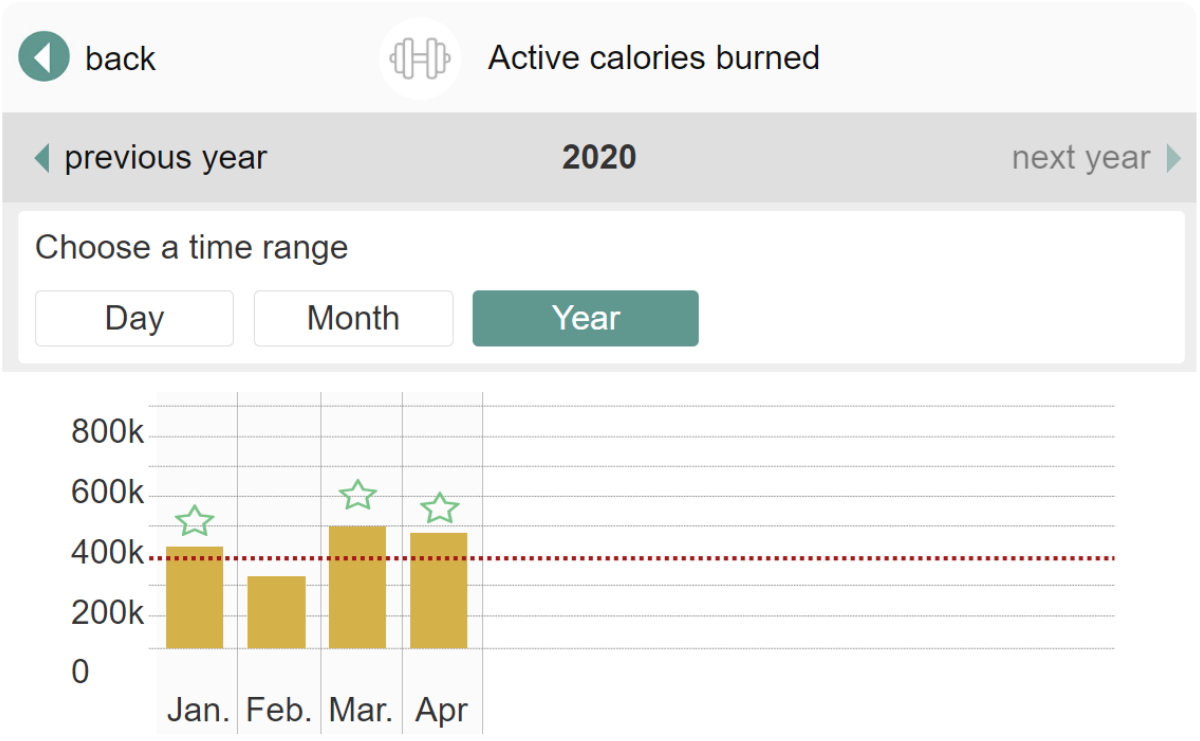

Fig. 52 PELOSHA Assistant activity measurement yearly data screen

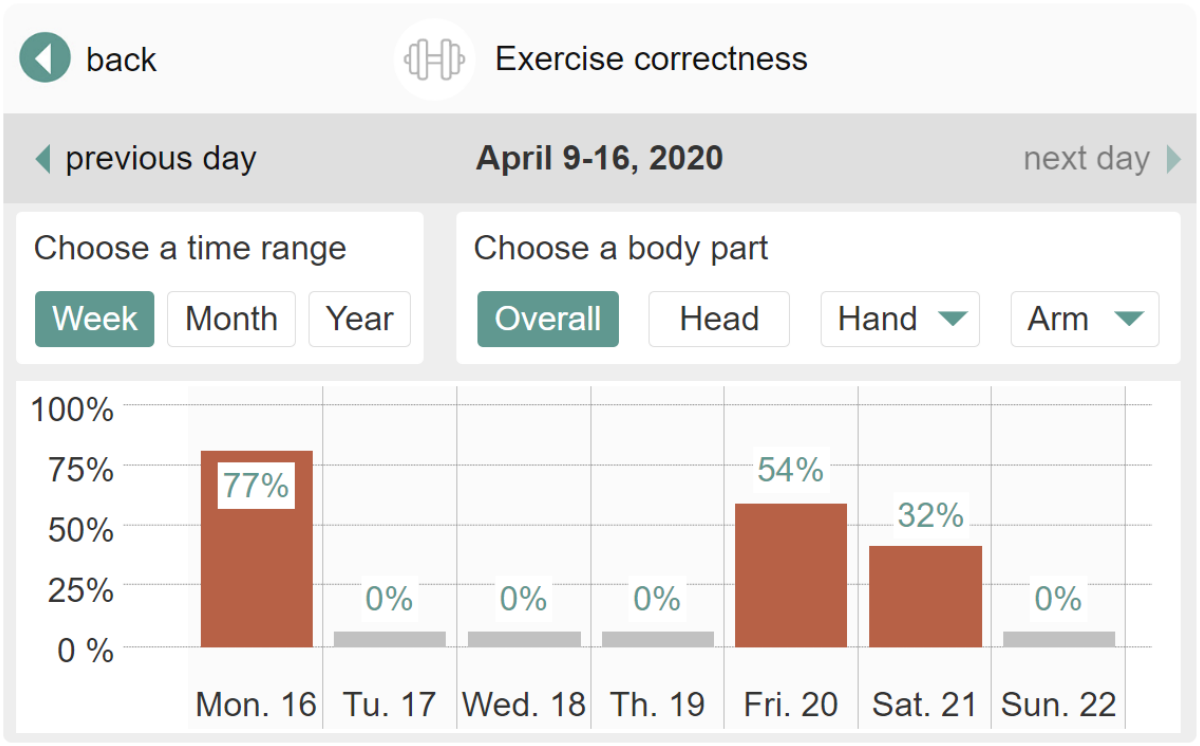

Fig. 53 PELOSHA Assistant exercise correctness screen

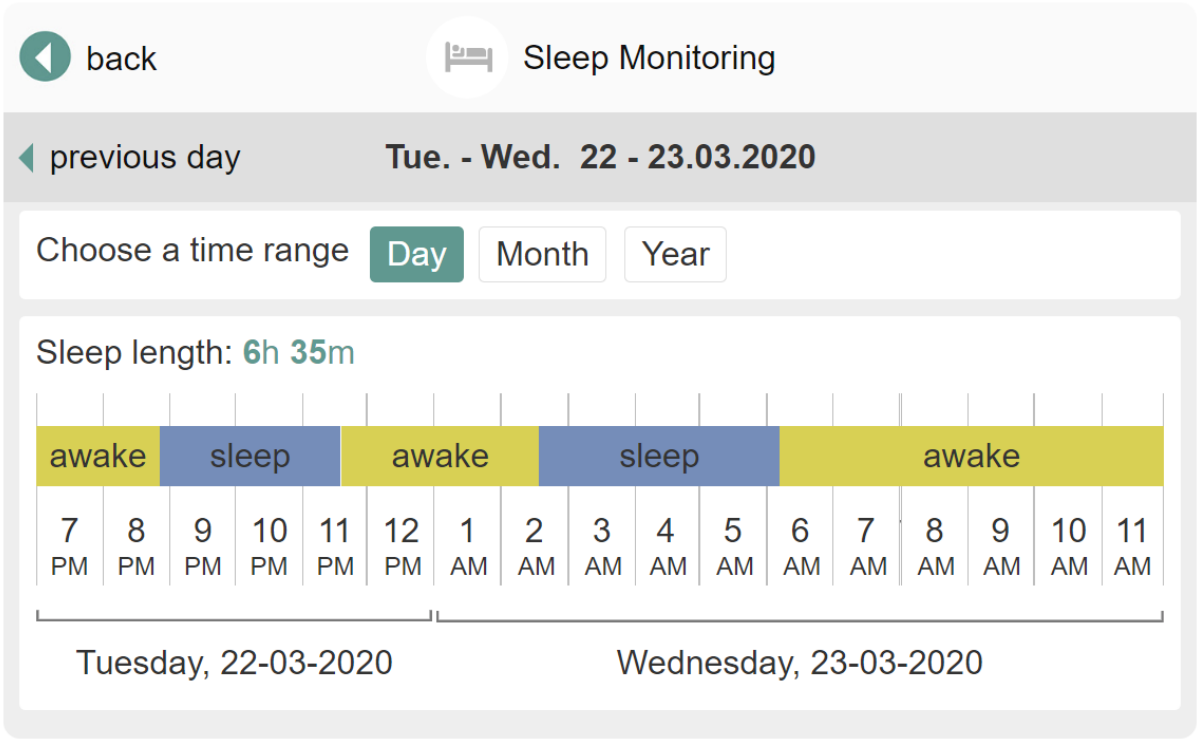

Fig. 54 PELOSHA Assistant Sleep Monitoring screen

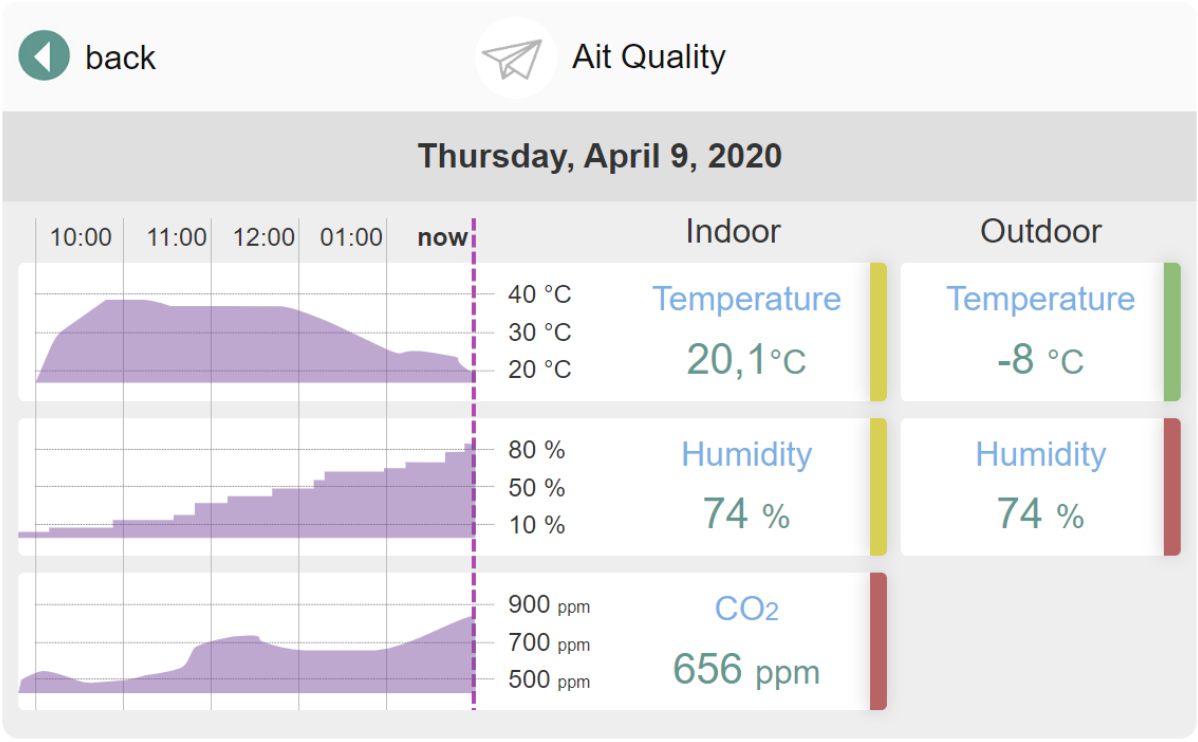

Fig. 55 PELOSHA Assistant Air quality module screen

4.2 UI SCREENS FOR THE CAREGIVER DASHBOARD

As established during previous user interviews, the Caregiver Dashboard used by the formal and informal caregivers is envisioned to run on a smartphone device – this is reflected in the mockups.

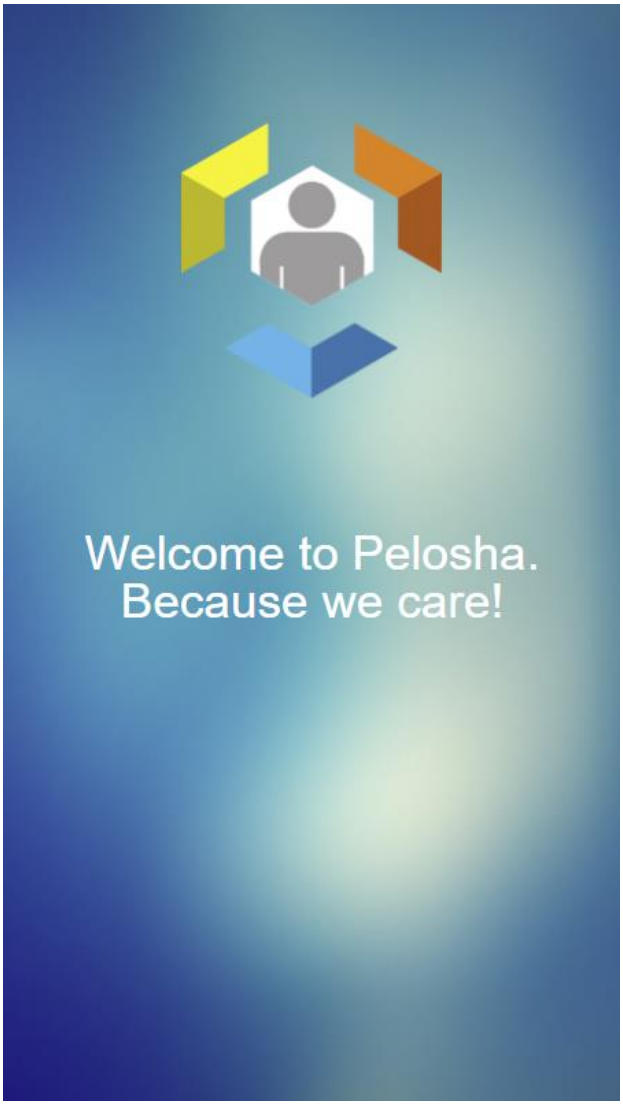

Fig. 56 Caregiver Dashboard welcome screen

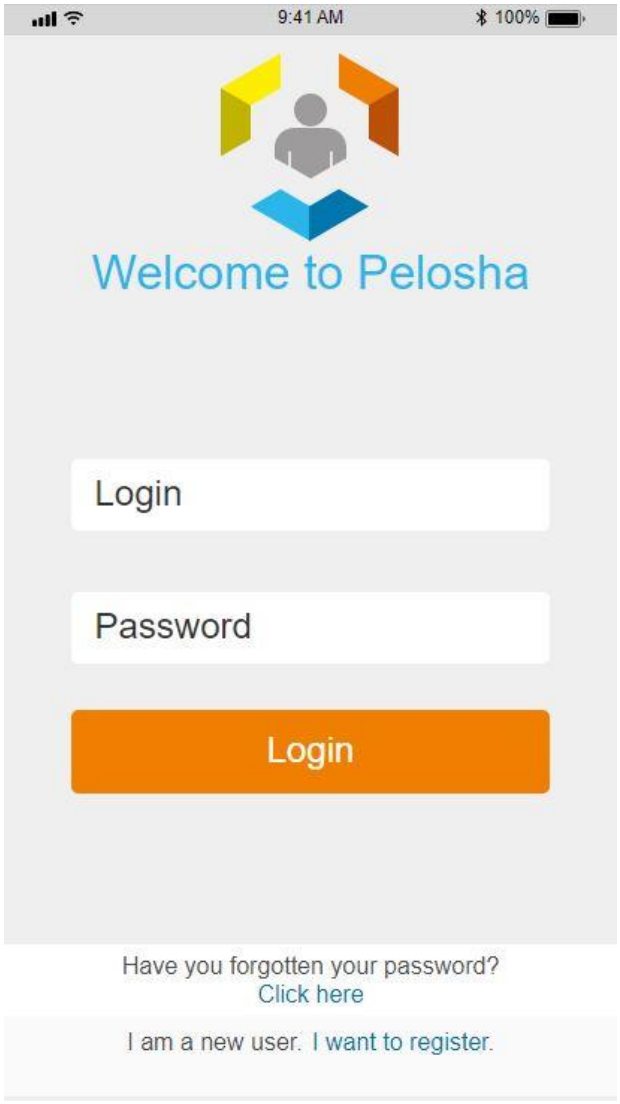

Fig. 57 Caregiver Dashboard login screen

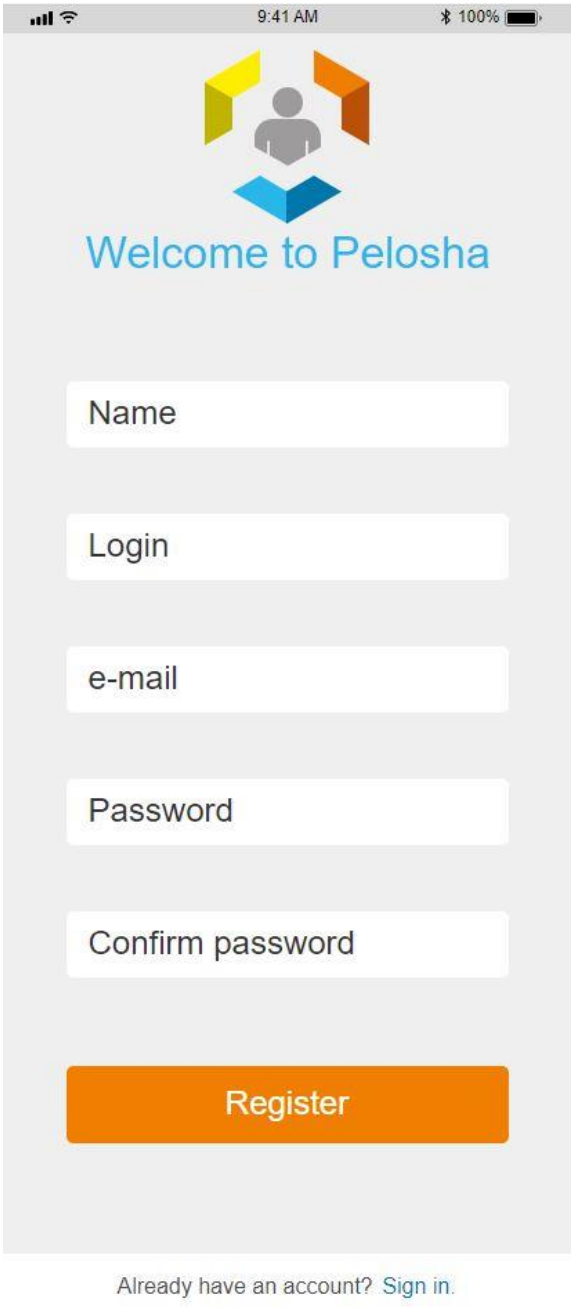

Fig. 58 Caregiver Dashboard registration screen

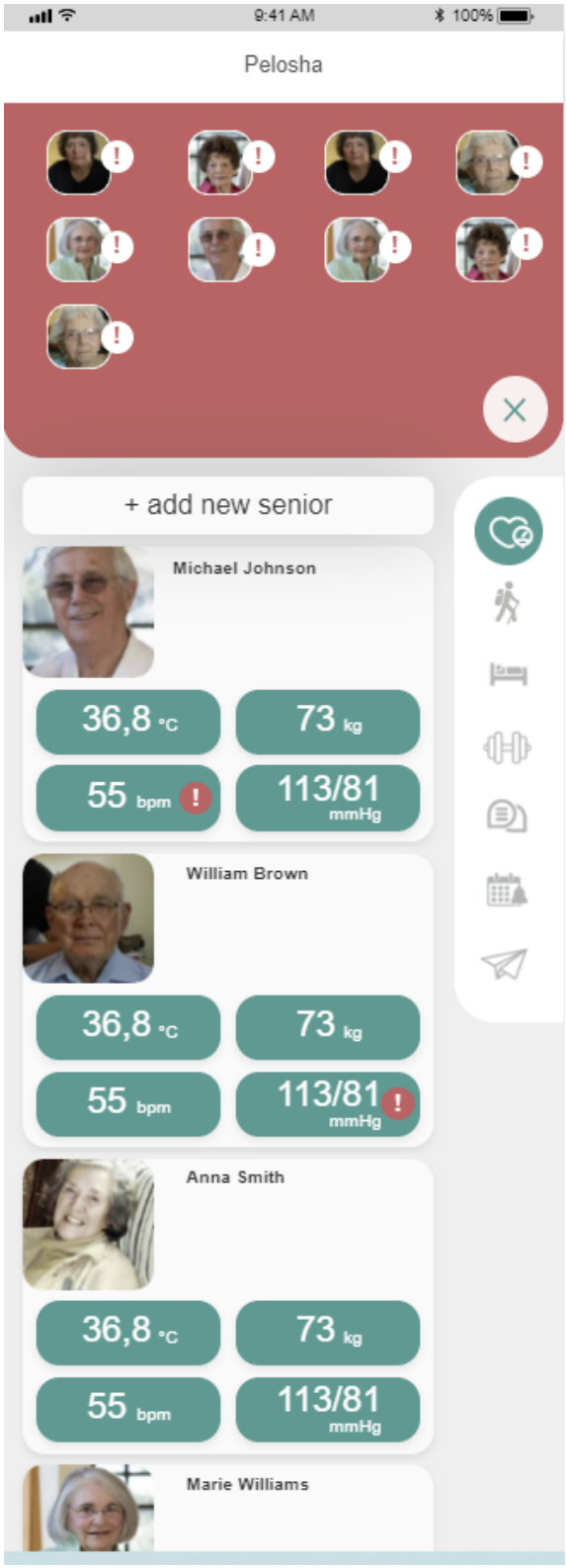

Fig. 59 Caregiver Dashboard list of seniors screen

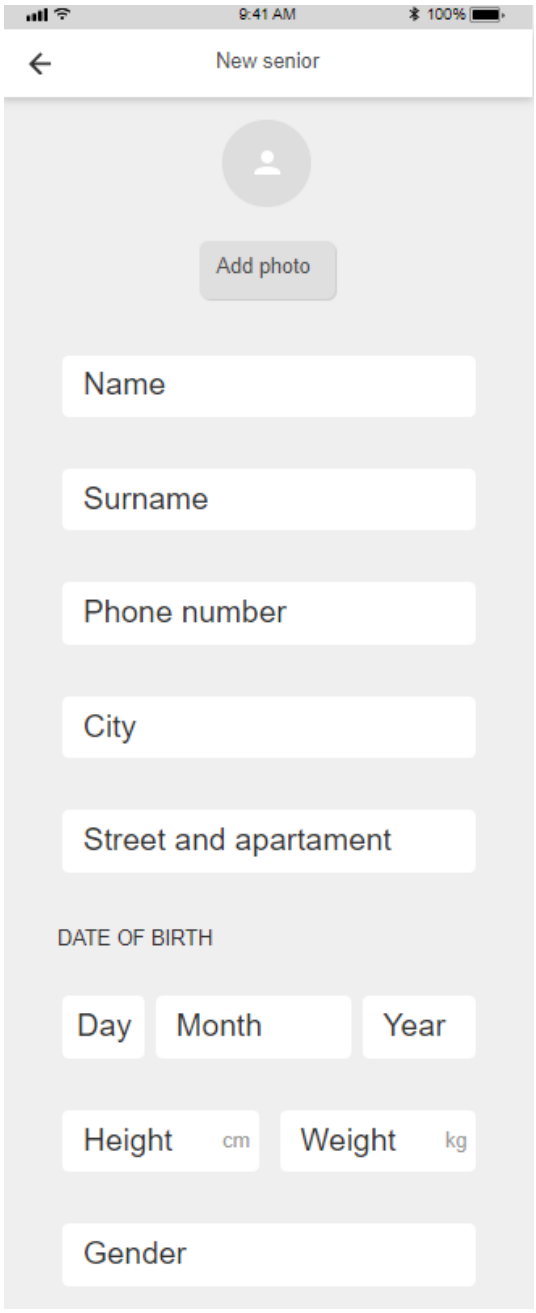

Fig. 60 Caregiver Dashboard add senior screen

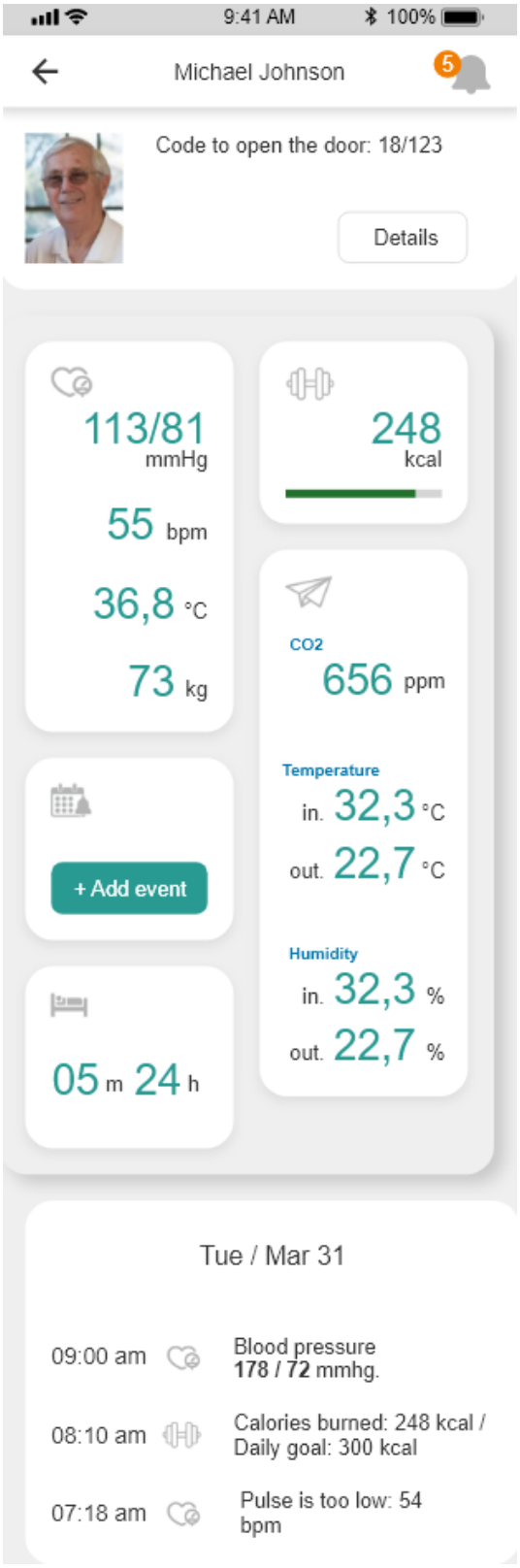

Fig. 61 Caregiver Dashboard senior details view screen

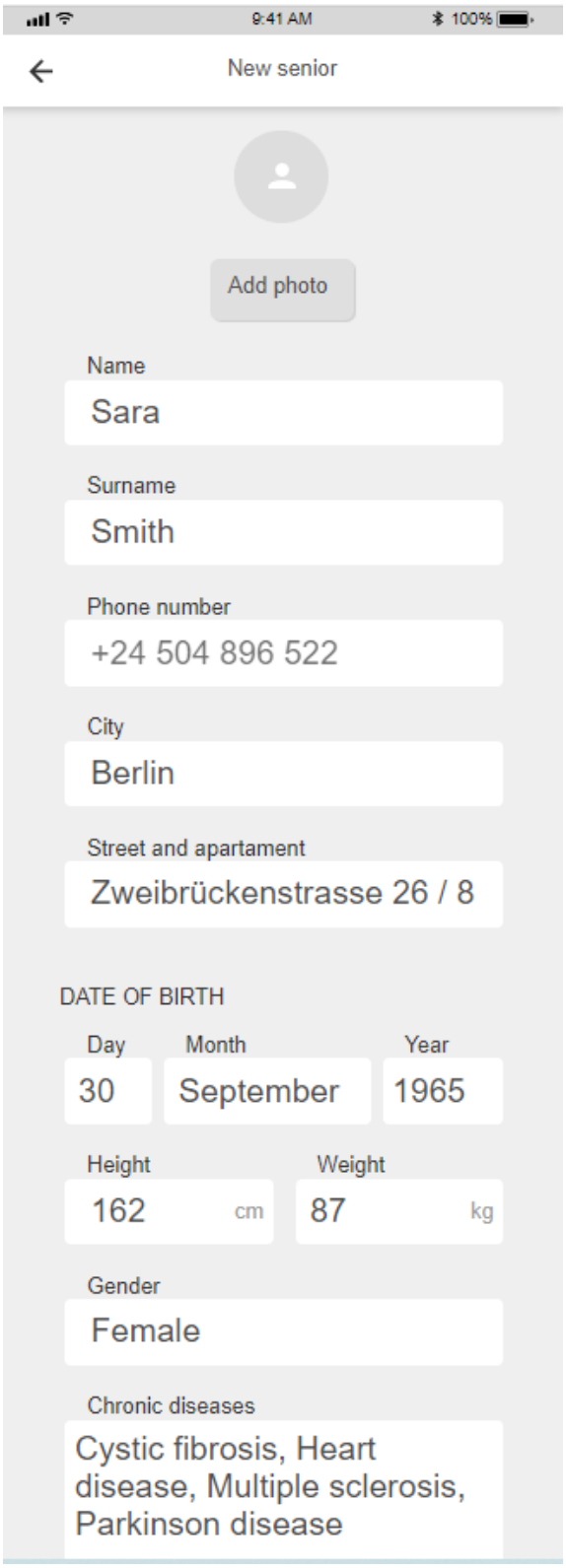

Fig. 62 Caregiver Dashboard edit senior screen

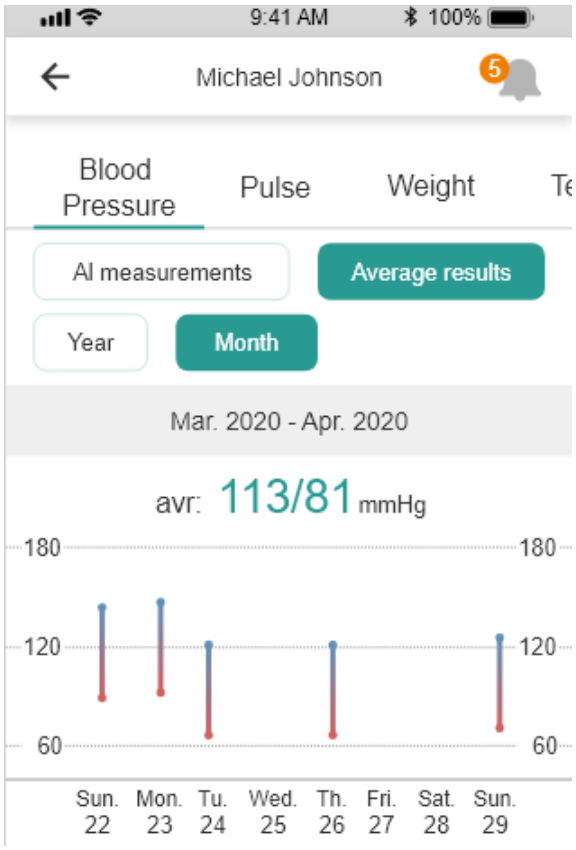

Fig. 63 Caregiver Dashboard blood pressure data screen

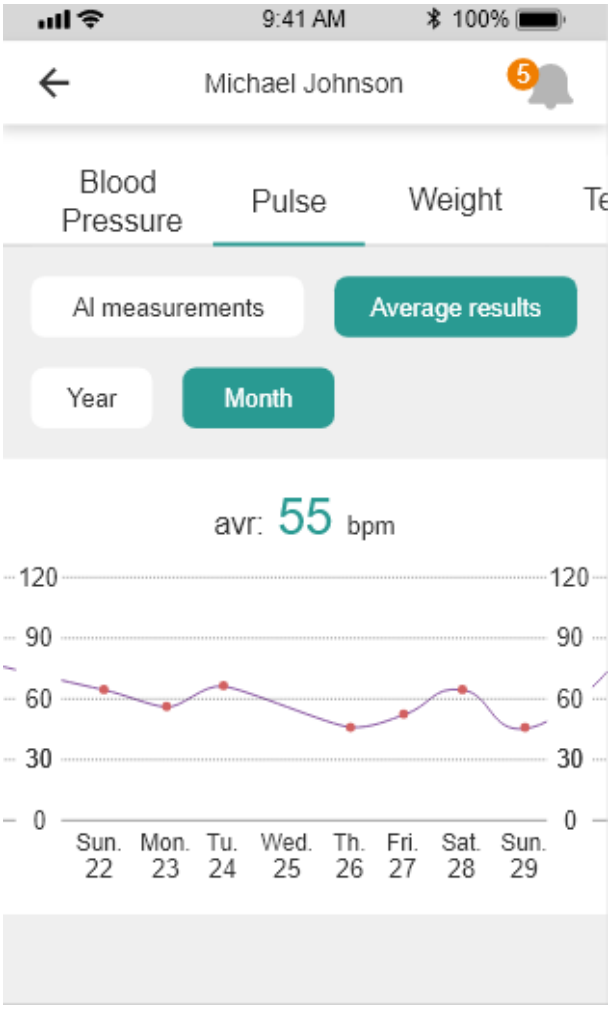

Fig. 64 Caregiver Dashboard pulse data screen

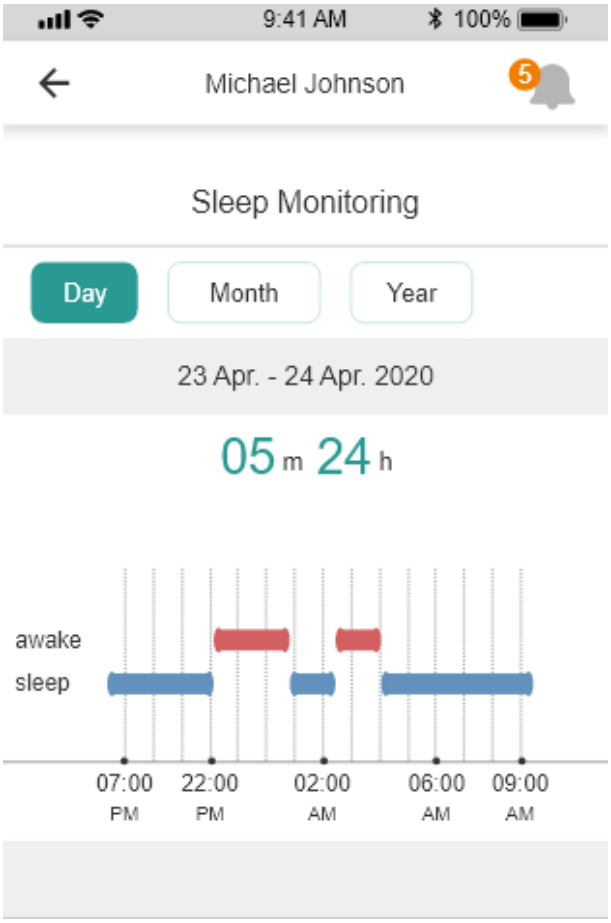

Fig. 65 Caregiver Dashboard Sleep monitoring daily view screen

Fig. 66 Caregiver Dashboard Sleep monitoring monthly view screen

5 CONCLUSION

The updated UI screens presented in the previous section, although they are still subject to change in result of feedback from end users and end user organizations, are already the basis of undergoing work on a functional UI for the PELOSHA package that will be deployed during the planned pilots, which will in turn be a source of further feedback and driver for continued development of the system' design.

ANNEX A DEMOGRAPHIC INFORMATION

Table 4 Demographic information for seniors

Identification number	age	gender	school	Live independently	has an informal caregiver	benefit home service	Emergency button	Technologies use
S1Ge	84	F	University	yes	yes	-	-	Phone and computer
S2Ge	85	M	University	yes	yes	yes	no	Phone and computer
S3Ge	59	F	University	yes	no	no	no	Phone, computer and tablets
TP-CH1	82	M	University	yes	no	no	no	Smartphone, computer,smart watch
TP-CH2	85	F	High school	yes	yes	yes	yes	cell phone, smart watch, and smartphone
TP-CH3	68	F	Secondary school	yes	no	no	no	Cell phone, smartphone, computer, smart watch
TP-CH4	69	M	Vocational school	yes	no	no	no	Cellphone, smartphone, tablet, computer

Identification number	Frequency of use	Skill levels with new technology	App use
S1Ge	Every day	Moderately	
S2Ge	Every day phone	Not experienced	
S3Ge	Every day	experienced	

TP-CH1	Every day	Experienced	Internet, online banking, calendar
TP-CH2	Once a week	Not experienced	Fitness app, whatsapp, railway travelling, calendar
TP-CH3	Every day	neutral	Calendar. Photo, whats app, Rummy (card game), shopping app
TP-CH4	Every day	experience	Whatsapp, Facebook. Newspaper app, photo, GPS

Table 5 Demographic information for informal caregivers

Identification number	age	gender	Person who takes care and age	Senior have home service	Senior have home nurse	Technologies use	Frequency of use	Sill level with new technology	App use
IC1Ge	61	F	Mother, 82 years	no	no	Smartphone, computer, tablet	Every day	experiment	Mail, whatsapp, sms, call
IC2Ge	59	F	Mother, 85 years	no	no	Smartphone, computer	Every day	neutral	Internet, messenger, games
IC3Ge	74	F	Husband, 76 years	yes	yes	Smartphone, computer	Every day	Not very experiment	Messaging, mail, whatsapp, internet
IC4Ge	54	F	Mother, 89 years	no	no	Smartphone, computer	Every day	Not experiment	Messaging, music, GPS

Table 6 Demographic information for home nurses

Identification number	age	gender	Technologies use	Frequency of use	Sill level with new technology	App use
HN1Ge	60	M	Smartphone, computer	Every day	neutral	Messaging, internet, agenda
HN2Ge	46	F	Smartphone, computer, tablet	Every day	experimenter	Messaging, mail, meteo, pill app, medical app
HN3Ge	44	F	Smartphone, computer, tablet	Every day	experimenter	Medical app, internet
HN4Ge	67	F	Smartphone, computer	Every day	neutral	Messaging
HN5Ge	59	F	Smartphone, computer, tablet	Every day	expert	Messaging, agenda, note, internet, recall
HN1BE	53	M	Smartphone, computer, tablet	Every day	experimenter	News, media app, medication app
HN2BE	44	F	Smartphone, computer, tablet, smart watch	Every day	experimenter	Banking app, social media, health/fitness app
HN3BE	22	F	Smartphone, computer, smart watch	Every day	expert	Social media
HN4BE	33	F	Smartphone, computer, tablet, smart watch	Every day	expert	Social media, banking app
HN5BE	29	F	Smartphone computer, tablet, smart watch	Every day	expert	Social media, banking app

ANNEX B CONSENT FORM

Financing: European Commission & [NAME OF THE NATIONAL CONTACT POINT]
Coordinator: University Hospital of Geneva, Switzerland

Duration: 2019-2020

Consent Form

Dear sir/madam,

You are kindly invited to take part in the development of the PELOSHA system. This activity is part of the European research project PELOSHA. Before you agree on participating, it is important to read this consent form carefully and understand the procedure. If you have any questions or remarks, do not hesitate to let us know.

1. AIM OF THE PROJECT

The PELOSHA project aims to develop a system for assist the senior to be independent.

2. GOAL OF THE USER TEST

The purpose of the user test is to know if our system is easy to use by our target audience. You have to test our mock-up and we can observe if our mock-up is adapted to our target audience.

3. PROCEDURE

In the user test we answer you some question. After you will complete few tasks in the tablet/smartphone. Finally, we do a debrief. You are free not to answer our question and to leave the user test when you want. The user test is audio recorded with your agreement.

4. VOLUNTARY PARTICIPATION

You are asked to participate in the user test voluntarily. You can withdraw at any point in time without explanation.

5. RISKS

No risks to expect.

6. ADVANTAGES

You do not have direct advantages for you. But your test and opinion are a valuable input to improve our system for it is most suitable as possible to the target audience.

7. ANONYMITY AND PRIVACY

Directly identifying information is removed from the data and replaced by a code to guarantee anonymous data analysis and representation. Confidential data will be stored in a safe or locked file cabinet, and handled only by authorized staff members.

Information from the evaluation will be used for internal reports. Some outcomes might be used for PELOSHA dissemination and Journal or Conference publications as well.

8. CONTACT DETAILS

For more information about your rights as a participant, for further questions or in case you are unsatisfied about the way the user session is executed, you are free to contact the following researchers:.

- **[Name – organisation – email@email.com]**
- Responsible for execution of user session in [country].
- **Example: Laetitia Gosetto – HUG – Laetitia.Gosetto@hcuge.ch and [?]**

9. CONFIRMATION

If you are still interested to participate in the PELOSHA interview, please check the boxes below, and confirm your participation with your full name, date and signature on the bottom of the page.

Check the boxes

1 **I have carefully read this document. I had the opportunity to ask for clarification, and I confirm that I understand all the information.** ❑
2 **Based on the information, I agree to participate voluntarily in the interview.** ❑

3 I agree that data about the use of my answer can be used for research / the development of the platform and for earlier described communication. ❑

4 I agree that the user test is audio recorded. ❑

5 I agree that the user test is screened recorded. ❑

Name

_____

Date

_____

Signature

_____

ANNEX C DEMOGRAPHIC QUESTIONS

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.[p1]

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

☐ Every day

☐ 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?

_____

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

_____

For Home nurses

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

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

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. 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?

_____