Summary of the Milestone Report 3.3

Purpose

The purpose and research issue of WP 3.3 is to gain knowledge and acceptance on the use and handling of mobile devices by people in need of care and people suffering from dementia.

This purpose covers information about
1) The use of mobile devices by people in need of care
2) The usability and understanding of mobile devices by people suffering from dementia
3) Mobile devices and dementia
4) Apps and dementia

Methodological Approach

20 residents (90% female) from the nursing homes Gotthard-und-Anna-Hansen-Stift and Pflegezentrum Techau, thereof 10 with and 10 without dementia, were involved in the usability tests. The used mobile devices were tablets (iPad), smartphones (iPhone) and smartwatches (iWatch). Additionally, app-based scenarios regarding the usability for the app Life-Manager (album module, video module, message module, calendar module) as well as the weather app and the phone call function on the iWatch were developed and tested.

An exploratory mixed method approach was used. Therefore, a combination of qualitative interviews / conversations, qualitative observations and the quantitative System Usability Scale (SUS) questionnaire that is a popular quantitative method regarding usability testing was used.

The residents were encouraged to experience the mobile devices and apps their selves. One researcher mainly focused on testing the scenarios together with the residents as well as asking the residents questions regarding the usability while another researcher observed the situation and noted reactions and answers of the residents. Using the SUS was no problem for residents who are not suffering from dementia. However, people with dementia had major difficulties due to their limited cognition. Therefore, the people with dementia answered without the scale in own words that were also documented.

Within this context, the following guidelines by Silva & Nunes (2010) were taken into account for the usability tests (see Figure 1).
Results regarding Usability Testing of Mobile Devices and Apps

Use and Usability of Mobile Devices (People in Need of Care)

Most of the residents in need of care never owned a smartphone or a tablet but some of them used other technologies like a conventional mobile phone, a mobile phone designed especially for elderly or computers in former jobs. Other residents had experiences with mobile devices or were open-minded regarding technologies due to their relatives who showed them how the technologies work. On the one hand, there are residents who are very interested in using the mobile devices. On the other hand, there are residents who think they are too old to use them or they do not need them.
Moreover, some residents had difficulties regarding reading and seeing the texts and symbols especially on the smartphone and smartwatch. Nevertheless, half of the residents could see and read the texts and symbols on the mobile devices.

The majority of residents had no or minor difficulties with swiping correctly, typing or clicking. Only a few residents had difficulties but some of them improved their skills during the testing. In general, the residents had no problems seeing pictures and videos on the tablet or smartphone.

**Use and Usability of Mobile Devices (People suffering from Dementia)**

Some residents suffering from dementia owned a smartphone or tablet and others owned a mobile device indeed but never used it. Moreover, the majority think they would not use the devices due to less experience or disability. However, some residents were interested regarding the mobile devices.

Additionally, the majority of the residents with dementia had difficulties regarding seeing and reading the texts and symbols within the Life-Manager or on the smartwatch and think the size is too small. Not all residents were familiar with swiping but many residents swiped correctly from the beginning. Clicking and typing was a problem for many of them, in contrast, some residents had no or minor difficulties. Many residents had no problems regarding seeing pictures and videos.

Overall, the residents with dementia needed intense help and company from the researchers regarding the use of the mobile devices.

**App-based Scenarios (People in Need of Care)**

The reactions of the residents in need of care regarding the modules of the Life-Manager were various. Some residents liked the calendar module, could orientate their selves quickly in this module and could imagine using it. In contrast, some residents think the module would be not useful for them. Overall, the residents perceived the message module positively. They could handle this module well and would like to use it in their daily life. In contrast, some residents needed help by the researchers. In general, the residents were able to use the album module and video module very well, they liked the modules a lot and could imagine using them.

Regarding the weather app and phone call function on the iWatch, the residents’ opinions were diverse. Overall, the residents were fascinated by the phone call function but there were also some residents who were not that interested. Generally, the residents think they would rather not use the weather app on the iWatch.
**App-based Scenarios (People suffering from Dementia)**

The majority of the people suffering from dementia needed help by the researchers regarding the calendar module and assessed it as not very useful. However, some residents could handle the module well and were interested in the module. Moreover, some residents said the message module is not useful; some residents assessed the module as practical. Overall, the residents liked the album and video module and they could imagine using them; it seemed the video module was even more interesting for the residents. Few residents were not interested and some residents needed help by the researchers when doing the video call.

Moreover, many residents seemed to be not very interested in the weather app on the iWatch but very interested in the phone call function instead.

In general, residents in need of care had fewer difficulties in handling the modules of Life-Manager than residents suffering from dementia. Both groups were interested in the modules but people with dementia were a bit more reserved. The researchers needed to support residents suffering from dementia more often than residents in need of care.

**Conclusion**

In both nursing homes most residents with and without dementia had no or minor experiences with mobile devices. Therefore, most of the residents had difficulties regarding handling the touch screen of the smartphone and tablet. That means when using a touch screen technology in a nursing home environment it can be helpful to have general instructions of how to use a touch screen in advance. The rather small size of symbols, especially on the smartwatch and on the smartphone, was challenging for many residents with and without dementia. Therefore, older persons should use tablets.

On average, the score of the residents living at PT is 67,91. A SUS score higher than 70 is a sign for a good usability. In contrast, the average score of the residents living at GAHS is with 45,62 much lower and means remarkable deficits in usability. Further research could focus on additional usability tests with more participants to get further results.

The selection of test persons was up to a responsible person in the nursing homes where the usability tests have been conducted. The test persons were chosen due to current health condition and availability. Anyway, the sample cannot be claimed as representative.

While people with dementia had serious difficulties answering the SUS questions by using a scale ranked from 1 to 5, people not suffering from dementia only had minor difficulties. Therefore, a score could only be calculated for people not suffering from dementia.

For further information please have a look at the milestone report 3.3.
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