

Involving Users in the Development of a Smart(er) Toilet System

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Involving users in the development of AAL technology is good practice and has proven to be highly beneficial for enhancing the impact of AAL projects. But how to organize the user involvement in case of a taboo related application area, e.g. personal hygiene and toilet? This contribution describes the approach chosen by the iToilet consortium and outlines the experiences and findings of applying intensive user involvement in the development and evaluation of a new toilet system.



Background and Aim

The "iToilet" consortium is developing an assistive toilet, which is based on existing sanitary products enhanced by ICT-based components. The main focus is on older people who live independently at home. In addition the system also intends to provide benefits in institutions and not only to the older persons themselves, but also to their caregivers by reducing the burden of personal assistance on the toilet.

The envisaged toilet system provides functions such as setting the optimal seat height, dynamic support during standing up and lowering, automatic recognition of user preferences, voice control, safety (emergency detection, fall detection, etc.). We hypothesize that adjustability for different toilet heights for different "actions" should make toilet use much easier for (most of) our target users. Additionally, we assume that the adjustability will support users' independence and maintain safety for unattended use. These basic hypotheses have to be evaluated by applying deep involvement of users right from the beginning of the project.

The users involved in the project are (a) older people within a clinical rehabilitation setting (Rehabilitation clinic in Budapest) and (b) mostly younger but physically limited users with multiple sclerosis (MS day care centre in Vienna). The evaluation in everyday life must be carried out while the test partners' own day-to-day operational tasks are running.

Methods

A basic methodological difficulty is given by the taboo-related context of toileting with significant impact on the user participation activities. Starting with the positive experiences from a former project our approach was based on small focus groups with well done preparation, the building up of a good trustful atmosphere and the provision of several prototypes for hands-on assessment with clothes on.

In particular, in the case of the iToilet project special care has to be taken because of the vulnerable target group and the safety issues during dynamic physical support (for example during sitting down and getting up) calling for deep risk assessment.

The institutional test sites in Budapest and Vienna serve as an ideal setting for the participation of the later users and their professional care staff within the project. This allows to establish a continuous transdisciplinary dialogue with the developer.

Conclusion

Despite the taboo-related topic of toileting and corresponding routines of intimacy and personal hygiene the involvement of older and vulnerable users in the design and development activities could be set up successfully by a well-balanced participatory approach. The results have positively contributed to the technical development.



First prototype for laboratory trials: (1) Emergency stop (2) toilet chair with hand control (3) emergency call button (4) movement sensor (5, 6) screen and microphone for speech control (7) door sensor (8) RFID reader (9) fall detector

Outlook

After evaluation of the first laboratory prototype the participatory design activities will be continued by involving more users and by providing additional and/or improved hands-on material for gathering user input for the development of improved prototypes and a 2nd generation of the prototype for field trials.

More about iToilet:
<http://itoilet-project.eu>

