

Standardisation for mobility-related assisted living solutions: from problem analysis to a generic mobility model

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Problem

Assisted living solutions claim to support maintaining independence, one of the most important wishes for ageing or impaired individuals. This includes mobility, i.e. the capability, opportunity and performance of changing body positions and of locomotion. For mobility is a cross-sectional and complex subject, this paper deals with needs and challenges in order to support the development and interoperability of related ambient assisted living (AAL) solutions.

Discourse

The DKE, German Commission for Electrical, Electronic & Information Technologies of DIN and VDE, established an AAL standardisation roadmap, and a working group targeting on an application guide to be submitted to DIN and IEC committees. At first, working group members from transportation science and technology, human movement science, telecommunication, building industry, computer science and electrical engineering identified issues the document should deal with:

- (a) the individual need for support changes on different time scales, due to daily fitness, health or ageing processes
- (b) the usage of assisted living (or conventional) utilities itself can modify the user's mobility in a good or harmful way
- (c) a barrier (process interruption) between indoor and outdoor mobility can arise when devices and utilities have to be changed

Methods and data

The following steps were conducted:

1. to identify mobility-related aspects in national and in European projects in the field of AAL and in DIN ISO 9999 (a standard including mobility assistant devices)
2. to collect mobility-related user stories
3. to define a common theoretical platform
4. to develop complex user stories, covering different target groups and mobility devices
5. to develop example use cases, using the official UCMR format (Use Case Management Repository) from standardisation procedures
6. to develop a generic mobility model, using UML (unified modelling language)
7. to describe example use cases in UML

Results and perspectives

A model combining action theory [1] and a resource-based view is considered useful for identifying and discussing mobility aspects. Its main terms are (a) a situation, which comprises (b) a person with certain internal resources (abilities and skills), facing (c) a task with requirements and affordances, embedded in (d) an environment with external resources. Using this specific language scheme, the terms distinguish mobility as (e) room for action.

Consequently, the next step of standardisation in mobility-related AAL should be, that the provider has to state clearly, which options for which target group a product will offer, and which requirements its usage will demand. Example use cases show, that the generic model can easily be adapted to target groups of different age and living conditions in different situations.

Reference

[1] Nitsch JR, 1986. Zur handlungspsychologischen Grundlegung der Sportpsychologie. In Gabler u.a. (ed.) Einführung in die Sportpsychologie. 188-271.