

Using AAL-data for health care decisions – necessity of systematic information management

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Introduction

At the background of changing demographics numerous research projects were initiated investigating the potential of assistive technology to support people with special care needs in their home environment.

Data acquired via assistive technology can complement electronic health records providing a good basis for informed decisions. This involves both the provider and the patient, empowering the latter to participate more actively in his care. Information management in that context currently faces two major challenges: (i) Sensors usually gather continuous time series. To support medical decisions these data have to be aggregated, preprocessed and visualized adequately according to information needs. (ii) Context based integration of sensor data together with data from electronic health records is still in an early stage of research.

As a step to meeting these challenges a reference-process was defined to model the pathway from sensor to medical decision making. It helps identifying common aspects on a general level and can be adapted for particular projects.

Methods

A group of AAL and medical informatics experts identified the steps of the reference-process in a metaplan approach. The process will be validated by analyzing existing AAL solutions.

Results

The following steps were identified: measurement, digital output, data gathering, pre-processing, integrating different sensor modalities, data correlation and consolidation, integration with data from health information systems, analysis for medical decision making.

While the reference-process models the information flow from sensor to medical decision making in an abstract way, it does not define the necessary technical infrastructure, communication interfaces, and long term storage of data.

Conclusion

The reference-process illustrates the wide-spread importance of systematic information management in the AAL context. Interdisciplinarity of biomedical engineering and medical informatics approaches is crucial for using data from AAL components for medical decisions. Generalization of methods and advancing standardization are important research topics for the near future.