Introduction

Smart Homes

In this issue of *Technology and Disability,* special attention is given towards the use of technology in our homes. Under the heading "smart homes" usually technological developments are presented that enable living support by means of informatics and telematics. Since these are technology driven mainstream developments, it is not easy to translate them towards suitable developments for people with special needs (PSN). In my opinion, it is necessary to have a clear understanding of the meaning of "living" to be able to determine what kind of smart home technology may support the needs of PSN. Living (independently) can be seen as a complex of functions and activities that are performed in a living environment (house). Through time and in between different cultures the performance of these activities may vary, in means, quantity and quality. Living has an environmental dimension (a house in a street), a protectional dimension (a barrier against intruders), and a social dimension (meeting place with privacy). It also has an existentional dimension (Home). These dimensions are the result of the interaction between Person, Environment and Occupation [1] – an interaction that is constantly performed and validated through time. Thus "living" may change through time as a consequence of personal choice, or as result of changing external conditions. One of these conditions may be the introduction of technology. In can serve as a means to support independent living or provide previously unencountered barriers.

In this issue of *Technology and Disability*, special emphasis is given towards smart home technology, in general information and communication technology. The impact of information and communication technology in "living" is clearly present. They are the consequence of technological developments in specific areas, for instance, data handling and storage through microchip development, the possibilities of wireless data communication in and around a house, the development of drug administration through nanotechnology, the development of mechatronics enabling new applications in the field of robotics and home automation, and development production technologies enabling tailor-made man-machine interactions. All these technological developments may become part of the development of a smart home environment suitable for PSN.

As is demonstrated in the papers in this issue of *Technology and Disability*, smart homes may be advantageous for all. All of us need a safe environment, all of us may want to use environmental control systems to influence the settings of the technological infrastructure in the house. Looking to the press releases by technology developers (see, for instance, www.smarthomeforum.com) most of the developments in the area of smart home technology are directed towards the creation of a technological infrastructure and products that may provide wide scale use. They are not directed towards the needs of PSN. Applications that have the best potential in the next 1–2 years are in the area of security and energy saving, whereas comfort and homecare are of lesser importance, as judged by these companies. If one wants to use the developments in the area of smart homes to support independent living of PSN those areas are also of importance. However, depending on individual situations, a different priority setting may be used. Mainstream technological development may be translated towards the support of PSN, since it can create new opportunities to overcome existing barriers. A targeted technological development will be necessary to accomplish this. This situation also occurs [2] in other areas of technological innovation (rehabilitation technology and home care technology). Apart from the technology, the application will also consist of specific service related arrangements. To support safety it is not only important to detect unsafe conditions (for instance, by measurement of unwanted intrusion in the home), identification and organisation of appropriate follow-up measures is important as well. Taken together (technology and follow-up service), these determine a successful application.

Mainstream technological developments may deliver new approaches to support PSN. The match with needs of users is of importance.

In this issue, P.R. Boyce discusses user-related aspects in the area of lighting. Due to changes in the visual system as a consequence of the aging process a different environmental setting is needed to compensate for these changes. In a smart home environment one could easily organise these changes coupled to the measurement of presence in a specific environment. The paper underlines that a single user-related approach is needed in lighting instead of the one fits all practice. A second user-related paper, by C. Tam et al., deals with the development of an instrument to measure functional benefits of the use of electronic aids to daily living. Environmental control systems are widely used and accepted. The use in specific groups is restricted largely due to funding barriers. To overcome these barriers a clear measure of outcome in a reliable way will be needed. A third paper in the area of reaching user needs, by G. Dewsbury et al., deals with the designing process of acceptable smart home technology. This paper outlines the complexity of the arrangements that have to be made to meet the needs of the user. Technology and (service) arrangements together determine the effective applications.

Implementation of research results is always a difficult process. Also, many people, all contributing their respective parts, are involved in creating a living environment. In the paper of Ikonen-Graafmans a reflection is given on the creation of a barrier-free suburb in Finland.

The creation of a smart home environment suitable for PSN requires a dedicated technological and developmental process. The contribution of PSN themselves as partners in the development deserves special attention. In medical research their participation is safeguarded by ethical guidelines. In the contribution of M. Rauhala and P. Topo, the development of guidelines to support research and development of enabling technologies for PSN is discussed.

Taken together, these articles give an impression of the complexity of the development and application of technology to support independent living for PSN. The development of smart home technology is an area that deserves the special attention of the R&D community. Being part of mainstream technological development or part of a niche environment ought not be the major question – that should be the extent to which technology actually supports people (with or without special needs) in living.

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Guest Editor

References

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