

TECHNOLOGY-ASSISTED ELDERCARE

JAN-WILLEM VAN 'T KLOOSTER

The ageing of the population calls for smart solutions in healthcare. Remote monitoring can help elderly people continue living in their familiar surroundings for as long as possible. This type of technology needs to be smart, flexible and user-friendly. Researcher Jan-Willem van 't Klooster thinks that it will be possible as soon as 2012.



The development of usable technology starts with good field research with the potential user. For this reason, Jan-Willem van 't Klooster has spent the past year interviewing the residents and personnel of the healthcare centre Hoogstaete in Sittard. From these interviews, he hoped to learn which resources already exist, what needs to be improved and which demands the technology should meet.

The study revealed three important needs: providing support to people with forgetfulness - for example, taking medication on time -, performing remote monitoring of residents' health and achieving improvement in social interaction - *community building* - in order to prevent loneliness. Van 't Klooster elaborates, "There is still not much good technology available in this area. The equipment that does exist is not used very much in the care of the elderly, or it is not efficient. One example is the medicine dispenser that shows when and in what dosage a person should take medications. Although it does exist, it is not yet possible to program it remotely using a digital planner."

Van 't Klooster expects the combination of functions to be beneficial as well. "If you've forgotten your medication and you're sitting in the park, you need to be reminded to take your medication once you come home. If this type of reminder system is used for other purposes as well, it can let you know that it's time for an activity outside the home. It is a matter of configuring the technology for multiple purposes. It should be customized for each user. This would allow everyone to have access to the necessary functions, according to the individual situation."

This last point also holds for telemonitoring. Every healthcare centre, including Hoogstaete, seeks to ensure the health of its residents as much as possible. Measurement

devices can be used to keep an eye on processes as heart rate or blood-oxygen level. Mobile-phone contact can ensure that doctors or other authorized healthcare workers can consult the results of the measurements from any workplace, and take action if necessary. It can go even further: residents can be encouraged to engage in physical activity in order to maintain their condition. "Although this type of device does exist, it is not yet coordinated with other devices in the healthcare centre."

The third function of the technology to be developed involves the stimulation of social contact. One example would be a reminder of the bridge tournament in the recreation room. Another would be a signal, based on sensors in the residence, that the resident did not leave the apartment the entire day.

All of these possibilities depend on the integration of multiple functions and services into a technology that can be easily operated by personnel and elderly residents of healthcare facilities. Van 't Klooster refers to this as a service composition - a customized package. "The technology either does not yet exist, or it is fragmented. We hope to add

cohesion and deliver customization through the flexible combination of functions. This type of package could then be offered on screens at various levels. It could be on the LCD television in the living room, which is connected to the computer. It could also be on a touch screen. The smallest screen would be the display on a mobile telephone."

The PhD-candidate researcher will be spending the coming time developing the medication dispenser and ambulant monitoring: the mobile device that allows remote health monitoring. In 2012, the results will be tested in a pilot project involving approximately ten residents of the healthcare centre Hoogstaete in Sittard. The technology is ultimately intended to benefit all elderly people in the Netherlands, as well as in other countries. Van 't Klooster observes, "In the future of healthcare for the elderly, the ideal will be for people to remain living in their familiar surroundings as long as possible, supported by technology that helps them take their medication on time, keep exercising and avoid wasting away in their homes."

U-CARE

The title of the research programme, U-Care, stands for User-tailored Care service platform. In other words, it represents customization in healthcare support. Researchers from the University of Twente are active in four different components:

- The desirable and feasible applications of technology in healthcare
- The development of a business model that can place packages containing the investigated applications successfully on the market
- The integration of new applications into existing systems (for example, patient-tracking systems)
- Tailoring: the customization of systems according to the needs of the user

Within the U-Care research programme, software and technology specialists from the University of Twente are collaborating with Orbis Medical & Healthcare (*Orbis Medisch & Zorgconcern*), IBM Netherlands, the TKH Group, Mobihealth B.V., and IZIT (Healthcare Innovation through IT; in Dutch: *Innovatie van Zorg door ICT*), the association of healthcare organizations in Twente.