Wonderwalls: Hidden system makes it easier for elderly people to live at home

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Where are my reading glasses? A test person and Prof. Kerstin Wessig, Human Ambient Technologies Lab, are shown at the wall panel "LISA." Credit: U. Benz / TU Muenchen

Most senior citizens would prefer to live in their own homes for as long as possible. But memory loss and restricted mobility can lead to problems. Items like glasses or the phonebook disappear into thin air, or seniors can find themselves on the wrong side of a locked door after a trip to the shops. Many seniors end up unwilling to set foot outside the door, wary of their ability to get around or simply worried about the weather.

To alleviate these problems, researchers from Technische Universität München (TUM) and partners from the business world have designed a wall panel to assist the elderly in their own homes. A tablet computer is mounted in the wall and this provides a one-stop-shop for all the information they need. The weather forecast, bus timetables, family phone numbers and more can be accessed with a few simple taps on the screen.

The prototype was designed for an entrance hall area and looks like a wardrobe. But this is no ordinary wardrobe. Thanks to its smart technology, it can issue a warning if the apartment's occupant has not taken the front door key from the keyholder when they open the front door. The wall can keep track of other items that are often mislaid, too. It controls an "indoor positioning system" that can locate a pair of glasses, for example.

If the occupant is not feeling well, biosensors can measure key vital signs like blood pressure and blood sugar level. The system can then issue recommendations – from a spot of exercise to a dose of medication. If the smart wall detects a critical health problem, it will contact a physician or a mobile nursing service. These healthcare professionals could also connect to the terminal to regularly check the elderly person's health status. The terminal could also be linked to shopping or transport service providers.

Is the front door key in its box? A test person (right) and Dr. Christos Georgoulas, TUM Chair of Building Construction and Robotics, are shown at the wall panel "LISA." Credit: U. Benz / TU Muenchen

The wall unit would also handle building automation functions. An integrated air conditioning unit would keep fresh air circulating if the occupant forgets to air the apartment.

The researchers' long-term aim is to design similar wall panels for every room. In the kitchen, the smart wall could monitor the stovetop or make meal preparation easier with height-adjustable cupboards. A small assistant in the form of a mobile robot could move between the hallway and the other rooms. It would be able to carry a shopping basket and bring it to the kitchen on command, for example.

The scientists have been careful to promote independence: "We want people to retain as much of their independence as possible," affirms Prof. Thomas Bock of the TUM Chair of Building Construction and Robotics. "The assistance should only kick in when people are no longer

capable of doing something themselves." For that reason, the walls will have a modular design, with new functions added as and when required.

The assembly includes more than just high-tech features. The researchers remembered to add the usual hall fittings. Along with standard coat hooks, there is also a practical shoehorn at floor level.

LISA project:

The "Living independently in Südtirol / Alto Adige (LISA)" project is being headed up by Human Ambient Technologies Lab. The TUM research institutes involved are the Chair of Building Construction and Robotics, the Chair of Philosophy and Science Theory and the recently created Munich Center for Technology in Society. On the business side, the following companies are taking part in the LISA project: MM Design, Frener & Reifer, Kompetenzzentrum Alpines Bauen (KAB), Pfeiffer Architekten, TIS Innovation Park and Barth Innenausbau. The project is being supported by the Italian province of South Tyrol. The prototype has already undergone extensive testing and the business partners are keen to launch a finished product in the near future.

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