INNOVATION REPORT

User-centred multimodal communications platform provides interactive support for the elderly and disabled

EUREKA

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The ITEA 2 MIDAS project has developed a series of intelligent remote interactive services using different sensor, actuator and connectivity technologies providing customised support in a non-intrusive way to enable the elderly and disabled to continue living in their homes and local environments. Friendly adaptive interfaces, for use both indoor and out, have been developed or improved to overcome the natural scepticism and uneasiness of the elderly with respect to technology. While the integrated technical solutions are now available, suitable business models and political commitment are still required for wide-scale use.

Who cares for the elderly and the disabled – and who pays – is a major socio-economic challenge facing Europe and the rest of the world. There is a lack of infrastructure, an insufficient number of trained care workers and no continuous presence available to support an aging population in their homes – and the situation is already placing financial strain on national budgets.

Up to 25 % of the EU population will be more than 60-years old in the next ten years. One result will be less and less quality of care in hospitals. By enabling people to stay in their homes longer, it is estimated that it would be possible to put off the need for retirement homes placement and hospital care by 2 years. A major problem however is that suitable business models have not yet been developed for this sector as a move from public to private funding seems inevitable with governments no longer able to take responsibility financially.

Global, integrated system
MIDAS set out to develop integrated and scalable systems offering the elderly and the disabled the services and comfort they need in their own environment. The user-oriented interactive platform exploits new communications technologies and intelligent connecting systems for use in the home and while driving.

Concepts and solutions were studied to address some of the critical issues by enhancing quality, reliability and efficiency of a virtual presence in terms of physical, medical, psychological and social support. Key objectives included:

- Global prevention and stimulation for less isolation;
- Better quality of home care;
- Efficient medical aid and follow up; and
- Non-intrusive surveillance for security.

The ITEA 2 project developed a global-scale system for offering such services. Several different areas were involved with the aim of implementing a fully integrated solution. This involved prototypes and scenarios in social networking, communications and assisted living with all the tools accessible through a web portal with amalgamated views tailored to the people concerned – medical professionals, call centres, carers and family members.

Development of such an integrated platform enables collection of information from all types of different devices in the home. For example, partners worked on ambient communication such as Internet TV communications with messaging over the TV – making it simple for the elderly who are often in front of their sets to be contacted. They can receive a video or SMS and provide an acknowledgement.

Other partners worked on a social network web application centred on a user profile. This avoids the 'large social network'-type approach where individuals can be lost in a mass of contacts and information. The MIDAS application makes possible contact with more geographic proximity for local associations, family and friends. The platform can be fed by the local community – enabling the user to register for a local event and be picked up. The platform also focuses on guaranteeing quality of content, including medical information.

Many other applications
A range of other applications was also developed, including:

- ***Medical training for prevention***. This involved a touch table enabling users to fill their own pill boxes in a step-by-step process with remote help if necessary – really staying in touch rather than doing it for the person. MIDAS also developed an evaluation-and-stimulation tool with a radio-frequency identification (RFID) tray and tangible objects enabling health professionals to evaluate and stimulate

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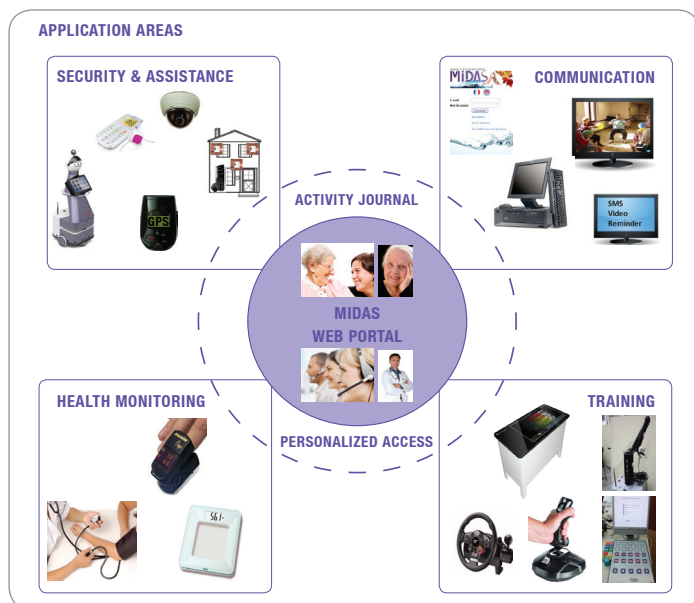
people at home or in hospital through tele-consultation. A drive simulator for training the oldest and encouraging them to keep an effective driver is also available.

- *Robotic support for the disabled.* This involved image-recognition processes to help training with robots, particularly for paraplegics. Such a system can identify an object such as a can or bottle, pick it up from a table and hand it to the person concerned.
- *Video coaching for wellbeing* with a visual display of exercises to keep people in good health at home when not mobile and so unable to get to a gym.
- *Security/assistance support*. Here robot assistance was combined with indoor and outdoor geo-location, video portals, multimedia boxes for security and activity monitoring – bringing together future ambient-assisted-living and call-centre assistance software to manage critical associations.
- *Health monitoring* – making it possible to control vital signs or carry out chronic disease management remotely.

A key advance was the simplification, collection and transfer of data from any device to **a web portal** which provides the necessary aggregation and relevant individual views required by the different carers involved – professional and family.

Existing and new technology
MIDAS made use of both existing technologies and specially developed applications. For example, the presentation of a video SMS on a home TV is a real improvement on most current telecommunications operator applications. However the new application needs to be deployed on real networks as it requires additional operational intelligence in the network.

Achieving this depends on a commercial decision by the network operator.

Simplifying interfaces was also a challenge that had to be faced as most current ways of accessing such services – from laptops to smart terminals – are often too complicated for the elderly and disabled to use. MIDAS developed friendly, adaptive interfaces designed to overcome natural scepticism and unease with technology.

The resulting interfaces are integrated in an overall ambient-assisted-living system which gathers input from the multimodal interfaces themselves and from devices around the end-user, making intelligent decisions and provide a feedback to the user. The multimodality includes monitoring gestures, eye gaze and emotions.

Simplifying questions were also asked in geriatric tele-consultations to enable the development of new process definitions and validation of medical protocols for assessing solutions and products.

Political and business commitment required
The outcomes from MIDAS offer a one-stop shop for personalised access to interactive home support for the daily life of the disabled and an aging population. While the project has been an undoubted technical success with a series of practical demonstrations, exploitation of the solutions developed is still a problem. Suitable business models now need to be developed – requiring both commercial and political commitment.

A major market study carried out as part of MIDAS showed clearly that there is a market but it is very fragmented with no clear big solution. Tools developed for the training area meet an existing need but this is still a relatively small sector. And the current tele-assistance market is mainly supported by voluntary organisations able to cover perhaps 20% of real needs.

Political concern is growing in this area but the gap in meeting the demand is still large, despite costs coming down. Commitment is necessary for future funding and those requiring these services will need to understand the costs.

More information:
www.midas-project.com