Introduction

IRIS is an acronym for “Independent Residing enabled by Intelligent Solutions”. The IRIS home is a demonstration apartment of about 90 m2, located at the Institute for Rehabilitation, Republic of Slovenia (IRRS), on the ground floor of the new building. It has been equipped with state-of-the-art equipment, technical aids and technology aimed at compensating for various types of disability. The apartment enables people with disabilities, as well as elderly people, to achieve the highest levels of functional independence. It has been equipped with appropriate technical aids and numerous electronic systems which allow the user to control the living space and to perform certain activities (opening doors and windows, drawing window blinds, switching the heating system on/off etc.) with minimal physical effort and in various manners (remote controls, voice control, wheelchair joystick, eye-movement control, etc.) The home has been also equipped with modern communication technology adapted to different types of disability, which enables people with disabilities to communicate with the outside world, partake in distance learning, work, leisure and entertainment.
Literature and the Internet include reports on numerous European demonstrative and practical projects in the area of “smart houses”. The lead role in the area is held by the Scandinavian countries (Sweden, Norway, Finland) and some others (the Netherlands, the United Kingdom, Germany, Italy, France, the United States, Japan and Singapore). Smart homes offer developmental, experimental learning and a demonstrating environment (examples in England, Italy, Switzerland, Germany, Belgium, France, Sweden, Finland and Norway). The results of numerous smart home projects have been transferred into residential areas for people with special needs, for example at Zwijndrecht (Belgium), North-Brabant (the Netherlands), Integer House – the Building Research Establishment, Portsmouth, York, Greenwich – Millennium Homes and Edinburgh (Scotland). The projects have integrated creative national potential (such as in the SENTHA group in Germany) and have surpassed the level of mere technological innovation by implementing solutions and providing services. Several studies have given reports on such projects with results of various approaches involving different collaborating parties, including local authorities and housing trust funds (Delta, Include, ASTRID, etc.). The projects have already demonstrated numerous experiences of attracting all interested parties and creating partnerships among providers of new technologies, public (state) institutions responsible for health care policies, health insurance companies, health care and social services, local communities, non-governmental organisations and potential investors.

One such example is SmartLab in Sweden – “technology that cares” (a demonstration apartment and a meeting place for the development of safer living). It is located at the Swedish Handicap Institute and it offers the basis for home adaptations, development projects, pilot activities and training. The Swedish Handicap Institute was founded and has worked under the Ministry for Health and Social Affairs, the Federation of Swedish County Councils, and the Swedish Association of Local Authorities (1). In Italy, examples of
demonstration homes include the “DAT Smart Home” in Milan at the Don Carlo Gnocchi Foundation’s S. Maria Nascente rehabilitation institute. There, people with various disabilities (mostly physical and motor impairments) can increase their ability to lead a more independent everyday life by means of contemporary technological solutions. The home includes occupational therapy programmes and a permanent exhibition of assistive technologies for mobility, activities for daily living and communication. The project has been carried out by the Bioengineering Centre of the Don Carlo Gnocchi Foundation. They perform therapeutic, demonstrative and research programmes. In Bristol, in co-operation with BIME (The Bath Institute of Medical Engineering), Bristol City Council’s Adult Community Care service, Bristol Primary Care Trust’s Intermediate Care Service, Dementia Voice (the Dementia Services Development Centre for the Southwest of England) and Housing 21 (a national provider of home care and assistance for the elderly), a demonstration smart home has been created for people with dementia, where patients can reside for up to three months and are then advised on the most suitable technologies to be installed into their own homes. The next example is from the Netherlands – “The Smartest House of the Netherlands, Smart Home Association” (van Berlo and Bierhoff), a 160 m² demonstration smart house with smart and assistive technologies and a house network with an information-communication system. The aim of that home is for the visitors to test out and

Minister of Higher Education, Science and Technology, Mojca Kucler Dolinar:

“Inclusion and active participation of each individual and quality of life are our task and commitment. We should not allow society to divide itself into those who know and can and those who do not and cannot, but should make sure that there are no differences, that all people are equal and that we all ‘can’. To live in and with an information society is a skill which has been increasingly affecting our lives and which has become almost indispensable in our everyday tasks. Therefore, we need to transfer modern information and communication technologies from the technical level to the levels of content and services. Only thus can we make contemporary technology a part of this society and a service to people, meeting their needs.”
experience the possibilities offered by contemporary technology. In Germany, the SENTHA project has aimed at improving the living environment for the elderly by means of modern technologies. Here, one of the main interfaces for environment control is a TV set, the use of which is familiar to the elderly. The home gives emphasis on safety and security, education and entertainment as well as on tele-shopping and tele-monitoring.
The Institute for Rehabilitation, Republic of Slovenia

The exact start of rehabilitation in Slovenia cannot be pinpointed, but it can be said that it started to develop quickly after 1952. The first initiator in the organisation of rehabilitation services was Professor Bogdan Brecelj, who in 1947 began work towards the establishment of a school for physical therapy. In 1953, in co-operation with international experts, he linked international experiences and the requirements of the time to create a programme for the development of rehabilitation services in Slovenia. In 1954, a written order was issued for the establishment of the Institute for Rehabilitation of the Disabled, which defined the role of the institute as a central body responsible for establishing a system of rehabilitation in Slovenia. The written order included, amongst others, two important points: firstly that the institute is responsible for medical and professional rehabilitation of people with disabilities, regardless of the cause of their disability, in order to compensate for their lost or impaired functions, and secondly that the institute is a national centre for rehabilitation of the disabled, and as such takes care of the organisation and professional management of such work within Slovenia.

The construction of the premises of the Institute for Rehabilitation of the Disabled was carried out from 1954 to 1962. The chief architect was designer Danilo Kocjan, who applied Scandinavian design principles to give the buildings their low and elongated form. Between 1970 and 1980, a programme of physical medicine and rehabilitation was established, integrating the units for medical and occupational therapy, and the unit for scientific research. After that, the institute started co-operating actively with institutions from abroad. This period was characterised by the activities of the Rehabilitation Engineering Centre, which developed the use of low frequency currents in rehabilitation (FES – Functional Electrical Stimulation), giving the institute its national and international reputation.

The period from 1991 to 1994 was a phase of transformation. In 1994, the University Institute for Rehabilitation (SOČA) became a uniform public health care institution and was renamed the Institute for Rehabilitation, Republic of Slovenia. During its 50 years of existence, the institute has gained international renown. Its knowledge, experience, research, and the numerous presentations of its staff at important international conferences and workshops have made an important contribution to the development of rehabilitation services.

Globalisation, joining the European Union, the fast development of rehabilitation science, constant changes and responsiveness to the globalisation of services have required and will continue to require a much more dynamic and selective dealing with patients and quality of treatment. Therefore, the values of the institute include expertise, responsibility, teamwork, affiliation, creativity and a patient-oriented mission aimed at improving quality of life, and enabling the return of disabled people to their living environment.

The aim of the project

The IRIS home will allow its visitors to view modern technology aimed at assisting elderly people and people with various disabilities. People with disabilities and the elderly can test the solutions offered in the demonstration home in order to find those solutions that can enable them to live as independently as possible in their own homes. Professional staff will offer people with disabilities, the elderly and their carers demonstrations and advice on how to adapt their homes in the most rational and sensible (and inexpensive) manner with regard to their specific needs.

The IRIS home will be used by professionals for regular education, for the planning of specific activities for immediate users (people with disabilities and the elderly) and for organising their training. The demonstration environment will also be aimed at designers of similar environments, mostly architects of interior and exterior design and planners of technical documentation for the construction of new buildings or adaptation of existing apartments and other building to the needs and demands of IRIS users. The apartment will offer the preparation of modular solutions, from the most simple to the technically most advanced, which means that individual solutions can be transferred into various environments (home, social institutions, nursing homes, etc.)

The IRIS home will offer an educational environment to students of medical, social and technical studies who can learn about the needs and problems of people with various types of disabilities, as well as learn about appropriate solutions.

The IRIS home will also enable producers of equipment and providers of services in the area of technologies aimed at people with disabilities and the elderly to promote their solutions as well as test and upgrade them in an integrated test environment. The IRIS home programmes will be aimed at research in the areas of Einclusion and E-availability in Slovenia. We wish to support activities for the promotion and implementation of the policy of E-availability in Slovenia.

Users

The IRIS home has been designed in co-operation with target user groups, which has enabled the highest possible
level of inclusion of their actual needs and wishes. The target user groups include people with disabilities and elderly people. The programme has been designed for people with motor and physical impairments (spinal cord lesion, cerebral palsy, multiple sclerosis, neuromuscular diseases, spina bifida, cerebral stroke, head and brain injuries, congenital physical deformities, rheumatism, etc.), blind and sight-impaired persons, deaf and hard-of-hearing persons, and the elderly.

According to the World Health Organization, the prevalence of disability is between 11 and 16%, and among people with disabilities 4 to 6% have the most severe types of dis-

The Laboratory for Telecommunications (LTFE) at the University of Ljubljana’s Faculty of Electrical Engineering

is one of the creators of the Independent Residing enabled by Intelligent Solutions (IRIS) smart home. Combining Information and Communication Technology (ICT) expertise with the needs of health care and rehabilitation has long been one of LTFE’s main focuses.

“In the IRIS home project, our experience from previous work related to E-accessibility and E-inclusion proved invaluable,” explains Damir Kervina, a researcher at LTFE. “We designed the PC area featuring various assistive technology solutions, implemented a personal health system for blood pressure monitoring, provided an E-learning platform and supported the telerehabilitation solution.”

Mojca Jenko and Matevž Pustišek also worked on the project at LTFE. They say the nature of the project brought with it a lot of planning and promotion activities as well:

“Such work included everything from writing a development plan for the smart home in late 2005 to mounting footage from the opening ceremony. Many of our colleagues also helped us in making the IRIS home a reality.”

The team at LTFE understands independence as a key prerequisite for E-inclusion. Using technology to communicate, learn, work and stay healthy in the home environment enables users such as people with disabilities and elderly people to be an active part of the information society. “Providing alternative ways of reaching equality in terms of possibilities and quality of life – this is what IRIS is all about,” concludes Damir.
Considering those data, there are about 200,000 people with disabilities in Slovenia and of these, about 10,000 have the most severe types of disability. According to the data of the Statistical Office of the Republic of Slovenia, on June 30, 2006, there were 31,338 inhabitants older than 65, which equates to 15.7% of the population. The 2004 US Census Bureau estimates that, by 2050, the proportion of the population older than 65 will have reached more than 20%. According to Administration on Aging, 19% of people over 65 face limitations in performing activities of daily living, and 4% of them have severe disabilities.

Direct goals

The IRIS home will provide a demonstration and test environment for potential users to learn about available technological solutions for high-quality independent life in their home environment. The IRIS home is a place where a potential user will gain all necessary information and advice on implementing suitable solutions in his or her home. The user will transfer the solutions demonstrated at the IRIS home into his or her own home and receive services directly from various providers. The majority of those services will be provided/performed as distance services. The “distance healthcare” services are mostly aimed at those areas which, due to the nature of the disease, require constant and long-term monitoring of the patient. Tele-medical services and distance home care will be a part of such services, enabling maintenance of health or its restoration.

IRIS home programmes will ensure that people with disabilities and the elderly receive professional and high-quality rehabilitation treatment. By means of the latter and by using the technologies demonstrated at the IRIS home, they will be able to live in their home environment and achieve a higher level of independence and safe living. Consequently, the costs of home care will be reduced (health care, home nursing, etc.) as well as the need for placements into nursing homes or other institutions.

Activities of the IRIS Home

From the initial idea onwards, the entire project has been planned and managed in a way that would enable the IRIS home to serve its purpose and “live to the fullest”. Wide promotion will be aimed at raising the interest of the Slovenian public so that individuals and families can use the centre for viewing and testing all the demonstrated solutions and find those that can bring improved quality of life to their home. The IRIS home will employ professional staff (occupational therapists and technical staff) offering demonstrations of individual technological solutions and information on how to reach those solutions as fast and as inexpensively as possible. The staff will give advice on the integration of the BeeSmart - Interactive Services on the TV Screen within the IRIS smart home

Arso Savanović

The innovative and advanced BeeSmart middleware platform is at the heart of the Independent Residing enabled by Intelligent Solutions (IRIS) smart home. BeeSmart builds on the Internet Protocol Television (IPTV) technology, extending and supplementing the latter in an innovative way, so that other interactive services can be integrated into the IRIS smart home in addition to the basic entertainment services, which are inherent in an IPTV system. The BeeSmart platform has been developed and integrated by Smart Com, an IRIS home technology partner.
The central role of the BeeSmart platform is manifested in two ways. On the one hand, it is the central technological hub of the IRIS Smart Home i.e. other technological modules are directly connected to BeeSmart and these modules communicate with each other via BeeSmart. The platform thus integrates various distributed information and communications technologies (ICT) modules and subsystems, each providing specific services to the end user, into a seamless multimedia and multipurpose system at the disposal of the IRIS user. Example subsystems include both internal subsystems, such as the EIB/KNX home-automation system and the ambient intelligence subsystem, and external subsystems, such as the dedicated servers located at the premises of various service providers and connected to the BeeSmart system via the Internet.

On the other hand, the BeeSmart platform provides the IRIS user with an intuitive and easy-to-use central control panel or control centre for activation and use of the IRIS technology-based services. A graphical user interface (GUI) allows the user to control and interact with various IRIS services via:

- the remote control and the TV set;
- the computer.

The look and feel of the GUI is the same in both cases. In the case of the TV-based user interface, various specialised universal remote controls have been integrated with BeeSmart, which further facilitates use of the IRIS services for disabled users. For example, the wheelchair-fitted remote control facilitates control of IRIS services via the wheelchair joystick, whereas the remote control with voice recognition facilitates control of the IRIS services via spoken (voice) commands or via a sip-and-puff switch. Similarly, in the case of the computer-based user interface, the computer is fitted with various specialised input devices to further facilitate use of IRIS services by people with disabilities.

Services within IRIS-like environments are aimed at providing the user with the highest possible levels of safety, independence, and comfort of living. Example BeeSmart-based services within the IRIS home, accessible to the user via the TV set, include:

- entertainment (TV, radio, Video on Demand – VoD, Personal Video Recording – PVR, online games, etc.);
- environment control;
- remote TV-based shopping;
- remote social care service;
- remote health care services, e.g. telediagnostics;
- ambient intelligence – automatic environment personalisation.

Due to the nature of the IRIS home, it is expected that the list of interactive services will be extended in the future.
tested technology into the homes of people with disabilities. The IRIS home will be fully included into regular rehabilitation programs for patients with the most severe disabilities. By performing rehabilitation for those patients in the demonstration apartment, we will be able to determine the methods and technological solutions enabling the highest level of independent living in the patients’ home environment, thus bringing quality to their lives.

The IRIS home will allow its potential users to view and test technological solutions and the programme’s primary mission will be to inform the public on rehabilitation technology and practical solutions. Knowledge and experience will be disseminated with lectures, media presentations, etc. It is expected that two to three professionals will need to be trained in each Slovenian region. The IRIS home will offer regular education and training to regional professionals. It is expected that 15 to 20 people will need to be trained and educated with special skills and knowledge. The education will be carried out within the tertiary level activities of the institute.

Since the entire equipment, technical aids and services of the IRIS home can be presented and demonstrated on the Internet, we find it senseless to have several demonstration centres with expensive equipment and technology in Slovenia. We believe that it is more rational to have one demonstration home, and to upgrade its equipment regularly, while covering the rest of the Slovenian regions by means of modern information pathways and educational programmes. The regional programme locations will need to be equipped with all the necessary infrastructure for “on line” voice and display connection to the IRIS home.

The funds for opening the IRIS home (architectural design, the purchase of equipment, technical aids and technology) have been allocated by various sources (the Ministry for Higher Education, Science and Technology, the Ministry for Labour, Family and Social Affairs, sponsors). Additional funds will be necessary to cover the costs for employment of new professional staff, maintenance staff, for the maintenance of equipment and technology, and regular upgrading of technical aids and technologies.

The financing of new technical aids and technologies to be used by potential users of IRIS home programmes will need to be addressed. Compulsory health insurance covers certain advanced technical aids and technologies, such as special devices for wheelchair control, alternative communication systems, etc. In the future, however, we expect certain technical aids or technological equipment and services within the new programme to be funded by institutions such as the Ministry for Labour, Family and Social Affairs, the Pension and Disability Insurance Institute, the Employment Service of Slovenia, partly also by additional health insurance, various foundations, (AmI) concept research, design and development. Participation in EU framework programmes, a number of research results and an extensive knowledge database enabled SETCCE to deliver practical experience of ambient intelligence for the Independent Residing enabled by Intelligent Solutions (IRIS) smart home. Project results have a profound local and global import and present one of the first implementations of ambient intelligence in a live environment.

“...The concept of pervasive systems aims to extend and seamlessly integrate existing information and communication technologies (ICT) on one hand and emerging human-computer interaction (HCI) technologies on the other. The concept of AmI extends traditional pervasive systems by integrating sensor technologies to detect user activity and environment parameters and further extends it by adapting the
ambient conditions according to the user’s intent. Such AmI systems offer a proactive automatic response of the living environment, that takes the user’s context, needs, and preferences into account,” states Jan Porekar, the head of the IRIS home ambient intelligence project. “Our long-term vision is to provide support in transition of business environments, business processes and personal living environments towards AmI vision.”

To support the IRIS home project with novel assistive living technologies, SETCCE has implemented AmI services to improve living conditions, support self-dependent living and enable better inclusion of the disabled and ageing population. The AmI services implemented are based on the iCore platform, specially designed and developed by SETCCE for smart house services. The iCore platform integrates smart items – a number of solutions and appliances for living environment automation, sensors for capturing environmental parameters and systems to detect user presence and movement. Integration is based on intelligent logic, which supports decision making with relation to the captured situation (actual environmental variables) and user preferences. The situation is interpreted within the iCore system as context – a database that manages user preferences, and environmental variables, such as user physical location, local temperature, lighting, daytime, etc. First-generation personalised services are developed and implemented on top of the iCore platform support features, such as intelligent window and door control, lighting control, living equipment and special furniture control. Control and automation of the living environment is based on digital representation of the environment where the user is positioned. For user movement tracking and position detection, a special dedicated RFID system was designed and deployed.

With the iCore platform for the IRIS home project, SETCCE has developed and implemented AmI services including digital representation of the living environment, user position and activity monitoring, capturing user preferences, and management and conflict resolution that may arise from two users sharing the same living environment. These services serve as a foundation for further design and deployment of complex (contents) services, as demonstrated in the IRIS home project by intelligent control of room lighting, control of furniture and living appliances and of air conditioning. Long-term goals for the IRIS home project are focused on implementation of services for capturing, identifying and proactively responding to user behaviour patterns. Such mechanisms will provide integral support for user monitoring and control of user situations, and will provide proper feedback in a crisis or emergency.

The iCore technology was designed and developed for a range of smart and automated living environment services. SETCCE research activities are also focused in parallel with AmI research initiatives such as the ambient intelligence enabling services for living environments (AIBO) project in co-operation with the Laboratory for Telecommunications (LTTE) and PERSIST, an EU 7FP project in cooperation with the European Microsoft Innovation Center, Intel, DLR Space Center, Telecom Italia, the University of Athens, the University of Edinburgh and the TSSG institute as co-ordinator. Ambient intelligence services and solutions are based on knowledge gained through internationally supported research initiatives, such as integrated projects Daidalos and Serenity.

“The field of pervasive systems and ambient intelligence is being transferred from research visions into industry. The IRIS home project is only an example of the potential such technology has in the next development cycle for networking technology. While computer systems have dominated today’s networks, we can expect that the number and variety of devices, such as house appliances and sensors will rise exponentially and eventually outnumber personal computers and servers. Pervasive systems will enable the design, development and deployment of personal, location-independent services, tailored to user preferences and context. Intelligent environment control is just one example,” states Aljoša Jerman Blažič, SETCCE’s CEO.

The next steps for the IRIS home project are focused on implementation of novel services, mostly content provision roles. The Institute of rehabilitatation, Republic of Slovenia
charitable trust funds, associations of people with disabilities, and partly by the users’ own funding.

The economic benefits of health care programmes similar to those carried out by the IRIS home have been demonstrated by results of research of the CUSTODIAN European project\textsuperscript{12}. The results showed decreased costs of institutional and home care. The results of research on the impact of contemporary technology (smart homes) on the treatment of people with disabilities and the elderly\textsuperscript{13, 14} have demonstrated the importance of a rehabilitation team in finding the simplest way of showing the user how to use the new technologies. Furthermore, it is important that the technological system is adaptable and simple, and that it includes a user interface adapted to each user individually, for him or her to control the environment as simply as possible. It has been shown that equipping individuals with modern technology accelerates their rehabilitation, increases their independence and psychophysical well-being, as well as improving their quality of life. It has also been reported that such equipment saves large amounts of public funds intended for the treatment of people with disabilities and the elderly.

Conclusion

The IRIS home will make an important contribution to Slovenian rehabilitation medicine. A new activity will be introduced – learning about, testing and applying modern technological solutions aimed at compensating for various disabilities, improving the quality of life of people with the most severe types of disability and integrating them completely and equally into education, work and social life. Rehabilitation programmes will be transferred into the user’s living environment and that environment will be included in continuous programmes of rehabilitation and care.

Summarised from: Rehabilitation; Rehabilitation Engineering and Technology: rehabilitation medicine, March 16 and 17, 2007, Volume v6.

Literature
1. http://www.hi.se/

Drage Rudel
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“My healthcare personal reminder”

Project partners: MKS d.o.o., Ljubljana, SIIX d.o.o. Ljubljana

Forgetting things is one of the burdens that elderly people must live with. But it could be a larger obstacle in their independence when living alone in their home environment. A reminder, which would alert them regularly when to take the medicine, go to the doctor’s or a physiotherapist, or to perform a telemetric measurement at home, would be highly valuable.

“My reminder” is a service that we developed to fulfil the above expectations. Its user may receive a reminding message in three ways: as a voice message on an ordinary or mobile phone and as a written message as an SMS on a mobile phone or email in a mail box. The messaging system is customised for single or repetitive events. For the latter different regimens are prepared e.g. to take medicines within a limited time period or with no time limitation (pills for blood pressure reduction, for example). “My reminder” will send one or more daily messages at selected hours or regular time intervals. The service is Internet based. A potential user, his/her carer or even a nurse can
input data over the Internet and start the service.
“My reminder” was developed for users with special needs but is now available to anybody who might benefit from it. We are confident that it will be appreciated not only by its users but also by their carers (daughters, sons, neighbours etc.) who will be released from daily care for their beloved. The service is now available for testing also within the IRIS (Independent Residing enabled by Intelligent Solutions) smart home.

“Red button” telecare service

Project partners: MKS d.o.o. Ljubljana, Centre for community home care, Ljubljana; SIIX d.o.o. Ljubljana

The telecare service called “Red button” is an ICT-based service aimed at:
• Enabling elderly, disabled and chronically ill people to live independently and safely at home and maintain their social and support networks;
• Providing a means of obtaining help when needed; and reassurance to the user, their relatives and carers.
It is based on a carephone installed at a user’s home. He/she may wear or carry a radio trigger device that, when pressed, activates the device. A staffed monitoring and response centre is contacted. The person in need is then able to tell the operator of the nature of his/her problem and the operator is then able to give advice or reassurance and, depending on the circumstances, contact relatives, neighbours or the relevant emergency services. The carephone may also be activated automatically by other triggers like a smoke, flood, heat or cold detector, or even a fall detector. A part of the system is also an electronic medication reminder that alerts a person when to take medications. It triggers a call to the response centre if pills are not taken on time.
The service has been available for years at a starting price of €25/month in some regions of Slovenia. So far, more than 800 users have been enjoying the benefits of this service. It is now available for testing within the IRIS smart home.

Data on home services at the user’s TV screen – The “Red button” service example

Project partners: MKS d.o.o. Ljubljana, SIIX d.o.o. Ljubljana, Smart Com Ljubljana

For independent living at home many elderly, disabled and chronically ill people need help that comes to their home directly (e.g. nursing, meals on wheels, home maid) or remotely (e.g. telecare or telemedicine service). Only by external support may they fulfil their health and/or social needs. For many of them it would be of great value if they had at their hand a monthly agenda on who will enter or has already entered their home and when, what services will be or have already been delivered, and also how much the services cost for the particular month. Service providers have these data, so they can share them with their users.
To demonstrate its feasibility we have developed an Internet-based solution that returns the user’s data to the user and presents them on an interactive IP based TV in the IRIS home. Data on calls done by a “red button” carephone in the IRIS home to the community response centre of Ljubljana were used as an example. A user in the IRIS smart home showroom has only to select “Telecare service” from the menu on the iTV to see the history of the calls and the user data available to telecare operators to efficiently respond when needed.
“Design for All” principles were used when developing the solution. Consequently, it can therefore be used for any other service and implemented for the general public as well. We believe that solutions like the one described contribute to a “user empowerment” paradigm.