Home-Enabled Assistive Electronic Services

Sorin PUSCOCI, Radu DRAGOMIR

Abstract. Romania has been developing communications technologies and networking up to such a degree that makes telemedicine services affordable. The eRomania programme is focusing on extending broadband communications up to a national scale and implementing public electronic services. National Communications Research Institute – INSCC in Bucharest has been designing TELEASIS, a NGN supported telemedicine project, to provide elders with home healthcare services. This paper presents the MITAS platform, the core component of TELEASIS, which integrates home healthcare and home social assistance applications.

Keywords: telemedicine, e-Health, elderly patient, tele-services, tele-assistance.


Cuvinte cheie: telemedicină, e-Sănătate, pacienți în vârstă, tele-servicii, tele-asistență.

1. Introduction

With the number of ageing population increasing across its member states, the European Union has undertaken a number of research initiatives around safeguarding technologies to assist the elders.

Home integrated electronic services are designed to grant people:

• access to public electronic services;
• access to tele-assistance services.

The home-enabled assistive electronic services supply elders with medical and social support. A tele-assistance system offers citizen-centered medical and social sympathetic services at economic costs.

* National Research Communications Institute – Bucharest.
equipment has been taking over home healthcare and social services.

Instead the tele-assistance system is able to deliver customary environment-friendly services. Last but not least the service-integrating tele-assistance system makes available healthcare to elders while sitting in armchairs at home.

2. Tools and Methods

The ICT-based tele-assistance platform, furnishing complex home services, consists of the components shown in Fig. 2:

- **hardware component**, a customized telecare module to interface medical devices, sensors, landed/mobile communications networks, Internet, PCs, PDAs, TV sets.

- **software component** supports (1) system logic applications to coordinate activities of the assisting staff and (2) client-customized applications for agenda activities.

- **system component** comprises MITAS modules (Home Tele-Assistance Integrating Module) and regional dispatchers connecting medical/social assistance centers. The system allows users audio/video communications within network.
An ICT mobile platform, Fig. 3 has been designed to (1) acquire basic bio-signals from medical devices, (2) feed a medical database residing on a remote server with patient medical data and (3) allow the elder patient to connect a private area network. The electronic interface provides the elder patient with wireless (Bluetooth, ZigBee, RFID, NFC, IrDA) and wire (FCC68, optic) connectivity, logic mainframe and a bunch of interoperable heterogeneous applications.

![ICT mobile platform](image)

Fig. 3. ICT mobile platform.

The barriers that may appear in implementing such a system in a real environment are:
- older people don’t use the internet and find technology challenging;
- ageing needs are not yet met in mainstream products;
- legal and technological barriers;
- fragmented markets.

Basically the following criteria have been taken into account in order to have the platform accepted at large by the targeted elder population:
- small size and light weight for portability;
- medical-oriented appearance for a better recognition;
- open functionality for future development;
- easy-push minimized keyboard;
- friendly operating menu;
- intuitive commands;
- biometric access.

The technology has to perform out of the user awareness. No technology knowledge should be requested from the user to operate the system, that is normally fulfilled by automating all of the functions. The new paradigm is building the system around the user to meet individual demands.

A thorough examination of the elderly patients to medical system interaction concluded the medical devices design. The pattern qualifies small size and light weight devices for hand-held mobility.

A medical like yet familiar appearance, easy-to-read big display improve the device degree of acceptance.

The device can be operated either from low-force push button keyboard or voice commands.

A friendly and intuitive menu should make the user ways to full functionality at no-cost training. Sound alert and/or blink alert indicate task completion.

Biometric approach allows user quick, password-free, intruderproof, safe access into the system.

The open functionality key feature adds dynamic expansibility to the system enriching it with new qualities.

3. Results

Home integrated electronic services platform is supporting medical and social tele-assistance for elderly people.

MITAS is a complex electronic module carrying the following main functions:
- provide interfaces to medical devices for distant healthcare services;
- provide interfaces to field sensors for home security services;
provide interfaces to PC, PDA or TV set to link users and dispatchers or public services; provide interfaces to Internet.

Home assistance applications is focused on particular homecare services which enable doctors to continuously monitor chronic patients and patients to live a normal life at home.

Doctors are tele-assisting patients through the integrating services platform. An online scheduled multimedia content is delivered to patients in order to organize therapy and lifestyle.

A friendly user interface supports multimedia applications and even touch-screen capabilities.

A duplex communications algorithm has been developed to transfer data from patients to dispatcher servers.

MITAS technology is operational within a prototype home healthcare services network to acquire valuable data of the system proficiency.

The platform design has relied on acceptance and security requirements that elder people could claim from such a device for an everyday handling and using. The platform designing has complied the fact that nowadays elder people are getting more and more acquainted with devices carrying out electronic technologies. The platform has proved being fully approved shortly after the training. The healthcare concerns the elder people are focused on have been prevailing the initial difficulties to surpass electronic technologies.

4. Conclusions

This paper presents the concept of ICT-based home electronic integrated services. A concept for an integrated tele-assistance system is developed to allow implementing medical and social assisting services for elders at home. A complex integrating teleservices platform has been developing at INSCC.

Innovative technologies within the homecare domain provide user-centred services which are aiming to:

- improve quality of life of elderly people;
- ensure sustainability of health and social services in terms of financial and human resources;
- create new jobs and business opportunities;
- develop awareness, mutual understanding and common approaches;
- build best practice exchanges within stakeholder groups, studies, benchmarking;
- accelerate investment in proven solutions through the ICT Policy Support Programme, Innovative public procurement, Regional Funds;
- plan the future through research and innovation

=> FP7 and AAL(Ambient Assistant Living) Programme

Implementing homecare systems in the Information Society is either a social necessity or an economic opportunity. ICT is a powerful tool case to support innovative homecare solutions relying on a comprehensive healthcare policy and a thorough understanding of elder's needs.

References


