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TELMES

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Telemedicine is part of the expanding use of information and communications technology in health care for prevention, disease management, home health care, long-term care, emergency medicine, and other applications. In Romania, the diversification of telecommunication networks and advances in communications technologies, including the Internet, has considerable potential as a medium for telemedicine applications.

In this context, the National Communication Research Institute (INSCC) has developed a Romanian telemedicine project, Multimedia Platform for Medical Teleservices Implementation – TELMES. The main propose of this project is to implement a scalable medical telecenters network, based on new IT technologies that are available in Romania. It is supported by a grant from the Romanian Ministry of Education and Research.

Secure Transmission and Records Acquisition

TELMES seeks to design a secure multimedia transmission (medical telemetry, digital images, video, and text) and a secure medical records acquisition system, in order to enhance the integrity of a telemedicine consultation.

Its main objective is to enable personalised teleservices delivery and patient safety enhancement based on prior diagnosis with medical telemetry using images, video and text transmissions, and also applying the mostappropriate treatment, according to recommendations from remote medical experts.

The TELMES project intends to enable a diversity of medical staff to provide complex medical teleservices; this could be achieved through a regional telecenters network. Medical teleservices will inevitably become part of the growing trend in Romania for using IT and communications technologies to deliver public services such as e-commerce, e-government and e-health.

TELMES Network Structure

The TELMES network consists of a variety of medical telecenters interconnected within a multimedia platform. At the moment of writing, we are developing a pilot network with two regional telecenters, located in the cities of Pitesti and Iasi.

The TELMES network has the following main components:

î Medical telecenters

î Network management center

î Medical database

The medical database represents a well-defined data structure for defining and managing all system dates. Each region has a regional database which will contain all patients and doctors resident within the particular region.
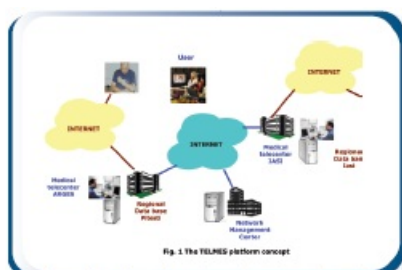
Fig. 1 The TELMES platform concept

TELMES database uses standard SQL for managing data. Because one of the main system architecture requirements has been to define a database independent layer, we are able to interact with different database systems that support standard SQL language.

Applications

From a user point of view, TELMES is especially directed at the segment of general practitioners in order to allow:

î Access to qualified information, by enabling direct cooperation with specialist physicians

î Efficient management of chronic illnesses
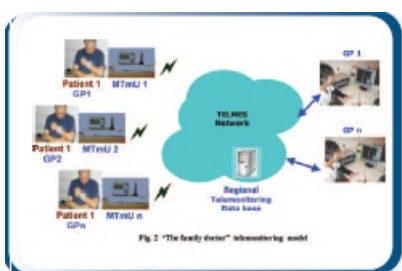
î Coverage of rural and remote areas

Fig. 2 "The family doctor" telemonitoring model

We believe that access to such a tool by GPs or other physicians in rural environments, especially those covering a large area, would permit them to call upon a group of experts through the TELMES telecenter, without a need to move the patients - sometimes hundreds of kilometres away. In our opinion, this would entail real gains for medical practice in Romania.

Teleconsultation Services: Off-line and On-line

Teleconsultation is simply the remote discussion of a concrete clinical case. Answers would be provided to precisely formulated questions for help in the making/ acceptance of a clinical decision.

î Off-line teleconsultations comprise a type of remote consultations not involving real-time network communication

î On-line teleconsultation involves real time network communication systems: video, chat, ICQ etc. This type of teleconsultation is used for emergency (urgent) medical care Teleconsultation services can be used for:

î Determination and/or confirmation of diagnosis

î Determination and/or confirmation of treatment

î Medical care for patients located at considerable distance from medical centers, when geographical distance between the patient and health-care provider cannot be overcome.

Telemonitoring Services

Telemonitoring services represent a set of activities necessary for planning and deployment of medical telemonitoring applications.

Medical telemonitoring is the transposition of distance medical monitoring activities, through a dedicated communication network. Telemonitoring system must comply with the core interoperability principle: "anytime, anywhere, by anyone who is authorised, and in any manner."

The TELMES platform has developed two telemonitoring models: respectively centred on the family doctor and secondly, on rural environments.

The Family Doctor Model

Within the family doctor model, we enable GPs (family doctors), to supervise a large number of chronically patients. GPs have the possibility to

connect to the medical regional telemonitoring database (TmDB), which is dedicated to telemonitoring activity, and access their own patient's related information.

Meanwhile, patients will be equipped at home with a medical telemonitoring unit – MtmU. This records the data from specific medical devices used for measurements, stores it in a local buffer memory and then transmits all information to the data base.

Fig. 3 "The telemonitoring to the rural environment" model
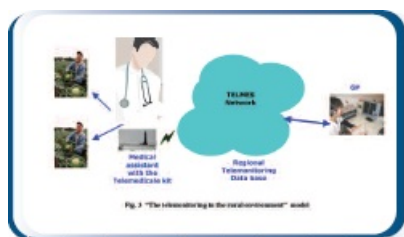
The information stored in the buffer memory is locally processed. This means that the values received from the measurement device are compared with the limit monitoring values (which were set by the doctor).

The Telemonitoring in the Rural Environment Model

Within this model, we enable GPs (family doctors) to supervise chronically patients in often-dispersed rural environments. GPs also have the possibility to connect to the medical regional telemonitoring data base – TmDB.

In this model, a medical assistant responsible for a designated rural area is provided with a dedicated telemedicine kit – MTmK – to perform medical measurements and capture data from the specific medical devices. MTmK will store the data in a local buffer memory and desptach data collected from all patients to the regional TmDB.

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