MHEALTH SOLUTION IN BULGARIA

P.Mihova[1], I.Pendjurov[2], J.Vinarova[3]
[1,2,3] New Bulgarian University, Sofia, Bulgaria
pmihova@nbu.bg[1], *penjurov@nbu.bg[2]*, *jvinarova@nbu.bg[3]*,

Abstract: **mHealth by definition is health care, realized through mobile devices for specialized procedures, information exchange, expertises and effects on patients and healthy way of life. As a technologically assisted action, it ensures dynamic unique interactions and contacts - temporary and permanent, on topics and problems of healthcare, as well as providing medical services to individuals and large contingents in unforeseeable circumstances and conditions.**

The paper presents project of a network for provision of continuity of care with telemedical and telehealth services between Greece and Bulgaria which will: be based on the Internet and 3rd/4th generation GSM services; handle the medical records of citizens of both countries, allow the patients themselves or those responsible for their care to enter data or to utilize for this purpose electronic devices that can do the task automatically (e.g., glucose measuring devices, portable ECG machines, spirometry devices etc); permit the treating physician to continuously monitor his patient's progress from a distance; permit the diffusion and dissemination (to specific target groups) of health related information; use smart card technology to fortify the security of data contained in the patients' records and provide tele-education for the medical and paramedical personnel involved in the project.

mHealth applications ensure collection of health and clinical data, delivering health information and real-time monioring of vital signs, and direct provision of information in different stages of its acquisition and processing. Small and convenient size, low power consumption, they can be integrated almost everywhere: furniture, automobiles and even clothes. Mobile phones or personal digital assistants (PDA) with wireless networking capabilities, can serve as inputs to the processes of storage and transfer of recorded and measured parameters to clinicians, selected by their subsequent applications.

Patients, involved in the current project, using their mobile phones will be able to send and receive short text messages. They can initiate telephone calls related to health information and education, study therapeutic schemes for meetings and consultations, transport to health experts, even just for support and courage.

Introduction

Success of this tele-health approach critically depends on providing easy and affordable access to patients' health records [1]. In this respect Internet together with 3rd or 4th generation GSM services enable telemedical and telehealth solutions that are both far-reaching and affordable [7]. It is now possible to implement a web-platform which allows affordable access to medical services within the regions of Smolyan in Bulgaria and Central/Eastern Macedonia in Greece. The presented here platform will contain records of the citizens using services, safely and easily accessible by their physician.

Matherial and method

"Continuity of Care" is a main prerequisite for the free and movement of people across borders within the EU. However, it is seriously compromised especially in the less developed regions of the EU. It is further compromised when it comes to the Greek - Bulgarian transborder infrastructures devoted to the prevention and control of communicable diseases or the use of controlled substances. In this connection it should be stressed that 16% of the population of both countries is hospitalized for one reason or another each year; more than 25% of the population visited doctor, at least once, during the last year; border mobility for employment accelerates the spread of diseases among the border populations.

During 2008, the border crossing station at Promachonas/Kulata processed more than 950000 vehicles and a total of more than 3500000 passengers in both directions. Today, however, the combination of mobile telephony with the Internet affords great opportunities in preventing the spread and protecting from disseminating infectious diseases (e.g., H1N1 virus) or following up the treatment for such diseases), in caring for patients with chronic diseases (e.g., Alzheimer's Disease, Arthritis, Asthma, Chronic Obstructive Pulmonary Disease, Collagen Related Diseases, Diabetes, Epilepsy, Heart Disease, Hypertension, Minimal Cognitive Impairment etc.) and in long term care and rehabilitation following stroke, surgical operations and chemotherapy or radiotherapy interventions in cancer.

The web-platform will accomodate medical multimedia content and will be geared towards both telehealth monitoring and tele-education regarding public health concerns and it is the choice of the public bodies involved to serve as their tool for introducing high quality continuity of care concepts and services in their respective regions.

Project's main idea is to develop a network for provision of continuity of care telemedical and telehealth services between Greece and Bulgaria which will be based on Internet and 3rd/4th generation GSM services. It would handle medical records of citizens of both countries, allowing patients themselves or those responsible for their care, to enter data or to utilize for this purpose electronic devices that can do this task automatically (e.g., glucose measuring devices, portable ECG machines, spirometry devices etc).

This solution would permit treating physician to continuously monitor his patient's progress from a distance and least but not last - provide tele-education for the medical and paramedical personnel involved in the project.

According to our calculations, the project would aspire to serve at least 15000 persons, among them workers, tourists, businessmen, soccer clubs and their accompanying personnel and fans and, finally, elderly citizens.
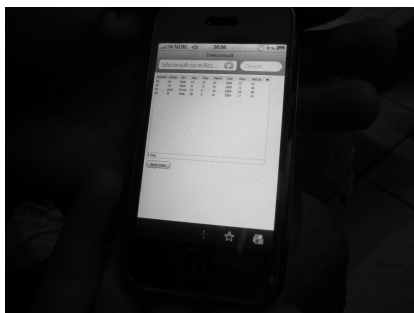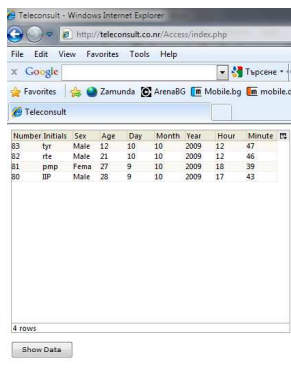

Fig.1. Doctors` view on iPhone

Fig.2. Doctors` view in web site

On Fig.1 and Fig.2 are presented screens from the web platform – loaded on iPhone and web site, view point of the doctor. The model is created purposefully with simplified design, because it should allow fast and smooth loading at the mobile phone. The Patient profile consists of detailed information about Medical history, status and paraclinical data. The doctors` view is enriched with the following data – Patients number, Initials, Sex, Age, Day, Month, Year, Hour and Minute. By selecting a record and clicking the button "Show Data", the Doctor can review selected patients' details.

Specialists are entered preliminary in the database, but the patients possess for each new record individual automatically generated username and password. The reason for this is that according to the Bulgarian law, the system cannot store patients data, except the initials, age and sex, which are not unique data. Using these generated pass and username patients can access the records from any point with Internet through any device – PC, iPhone, PDA.
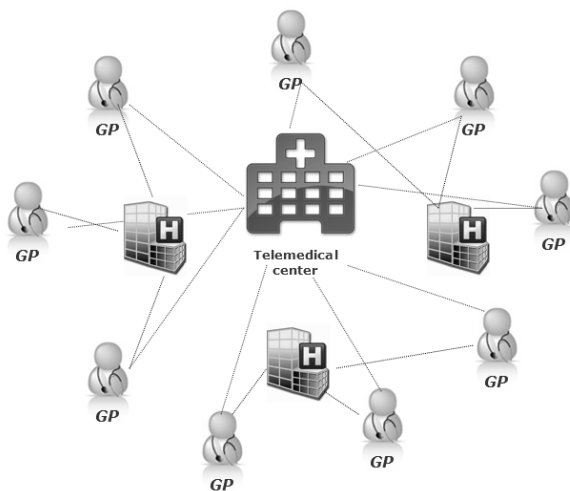

Fig.3. Concept of Telemedical center in connection with GPs

Our basic concept is to combine and connect each GP in a concrete region by providing telemedical desktop solution – another realized and implemented authors project [4] and presented here mHealth software, in order to achieve complete valuable patient service.

Some of the strategic objectives are:
- Improvement of the access to emergency and general health services
- Improvement of the efficiency of health service delivery
- Improvement of the clinical practice for enhanced health outcomes

Conclusion

Presented here project is an extension of authors development of Telemedical Information System, which combines telemedical functions with modern technologies – PDAs, mobile phones. Formal Internet

interventions exist in a broad context of diverse online health resources and services, which share elements in common like information, advice and peer support. However, most online health resources are not created by healthcare professionals. Internet interventions need to be designed to "compete" in that wider context. The democratization of production and distribution is central to the transformative effect of the Internet on society, yet potentially conflicts with healthcare's need for an evidence base and safe practice. This is a core challenge for our project realization.

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