Teleconsult – one telemedical solution in Bulgaria

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Abstract

The mission of Telemedicine is to provide medical services independent of geographical distances between the involved sites. Through Telemedicine patients can get access to medical expertise that may not be available at the patients' site. Experience over the last decade has shown that the goals of Telemedicine are not automatically reached by the introduction and use of particular new technologies per se, but rather require the implementation of *integral services and specialized information systems*.

Software Teleconsult aims to provide logistic and telemedical services between two distant hospitals on the territory of Bulgaria. By definition TIS is an information system necessary for the implementation of telemedicine services.

Our development is a product with three layer architecture – expert's, operator's and administrator's modules. Each of the profiles has specific functions and characteristics, discussed and experimentally introduced to the users.

This paper is focused on presenting the system itself, as well the implementation experience and different module parameters.

Introduction

Telemedicine, using new advances in telecommunications and sensor electronics, improves health care service availability in remote or difficult to operate environments. The transfers of electronic medical files allow medical practitioners to engage in diagnostic activities without being in the same physical location as the patient.

Fig.1. Three layer structure

For example, some telemedicine systems allow doctors to remotely view a patient using video cameras, still pictures, or other suitable imaging devices. A successful telemedicine program requires management dedicated to successful implementation and operation
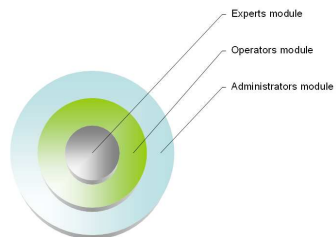
of the program. Generally, management is required at a number of levels to assure effective operation of the program.

Materials and methods

The current software is organized as it follows:

- Main software desktop solution, divided according to the operational level into three main parts (Fig.1.) – three different management modules that are developed according to the requirements and necessary functions for each participant in the telemedical process.
- Audio and video streaming through specialized software.
- Video communication through newly developed application with individual virtual rooms, locked and password protected meetings.

With this integral solution is performed the ability to verify whether a receiving physician is present, whether the receiving system can receive the transmitted files, whether the receiving system has received all prior files, and to otherwise ensure continuity of the medical record. Each patient is identified only with age, sex and physical conditions, in order to keep the patients privacy and confidentiality.
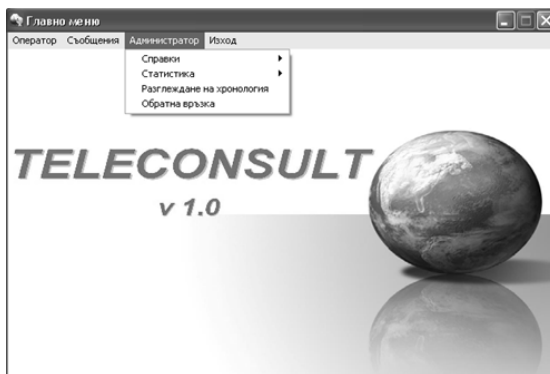

Fig.2 Entrance screen Teleconsult

Expert's module is designed and conformable to the specific telemedical consultation characteristics – each variant of consultation: required, consulted, not checked and with request for more information, is differentiate with its own color. The system checks every 30 seconds about newly arrived requests for consultations, and ensures sound and visual signalization to attract the expert's attention.

The operator's module (Fig.2.) is the main coordinator in the system, where the Operator (Fig.3.) manages the expeditiousness of the process of giving consultation, and in case delay of 24 hours, the system allows redirecting

the form according to the available specialists. In case of few requirements for the same specific condition consultations arrive at the same moment, the system distributes through the available specialists in the corresponding specialty.

He also has the rights to edit, save and delete the following participants: Medical experts; Hospitals; Municipalities; Graphics and Prices.

Fig. 3 Operators navigation screen

The Administrator performs functional connection between users and software developers, which is realized with system mailbox. He has the authorization to make any kind of statistics for anybody at any time (Fig.4.). Administrator's panel is developed in order to assure the correct performance of the processes, committing full access to every single user parameter that the system registers: name, activity, host, ip address, day, month, year, hour, minutes and seconds. The system allows filtering of any of the above mentioned parameters, Word & Excel export of the references, chronology control, and graphical representations in bars. Statistical basis is organized in 69 different sections. In order to prove the usability and benefits from telemedical investments, there are two statistics about percentage of application for a medical expert and for a hospital.
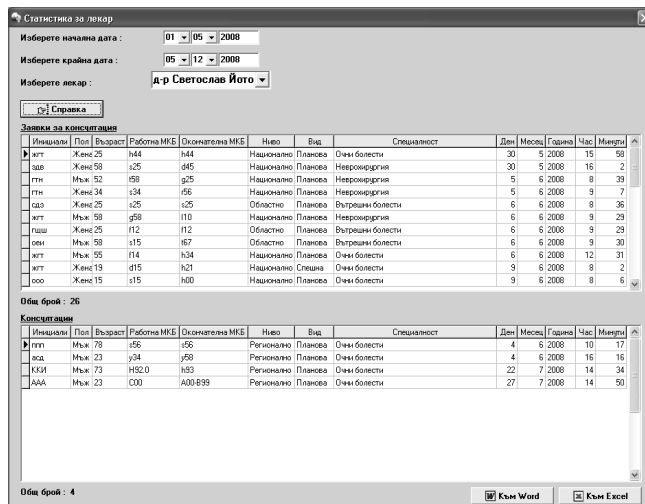
Статистика за лекар

Изберете начална дата : `01` `05` `2008`

Изберете крайна дата : `05` `12` `2008`

Изберете лекар : `д-р Светослав Йото`

`Справка`

Заявки за консултация

Инициали	Пол	Възраст	Работна МКБ	Окончателна МКБ	Ниво	Вид	Специалност	Ден	Месец	Година	Час	Минути
жгт	Жена	25	h44	h44	Национално	Планова	Очни болести	30	5	2008	15	58
здв	Жена	59	s25	d45	Национално	Планова	Неврохирургия	30	5	2008	16	2
гтн	Мъж	52	f58	g25	Национално	Планова	Неврохирургия	5	6	2008	8	39
гтн	Жена	34	s34	f56	Национално	Планова	Неврохирургия	5	6	2008	9	7
сдэ	Жена	25	s25	s25	Областно	Планова	Вътрешни болести	5	6	2008	8	36
жгт	Мъж	59	g58	f10	Национално	Планова	Неврохирургия	6	6	2008	9	29
пзш	Жена	25	f12	f12	Областно	Планова	Вътрешни болести	6	6	2008	9	29
овн	Мъж	59	s15	f67	Областно	Планова	Вътрешни болести	6	6	2008	9	30
жгт	Мъж	55	f14	h34	Национално	Планова	Очни болести	6	6	2008	12	31
жгт	Жена	19	d15	h21	Национално	Спешна	Очни болести	9	6	2008	8	2
ооо	Жена	15	s15	h00	Национално	Планова	Очни болести	9	6	2008	8	6

Общ брой : 26

Консултации

Инициали	Пол	Възраст	Работна МКБ	Окончателна МКБ	Ниво	Вид	Специалност	Ден	Месец	Година	Час	Минути
ппп	Мъж	78	f56	f56	Регионално	Планова	Очни болести	4	6	2008	10	17
асд	Мъж	23	y34	y58	Регионално	Планова	Очни болести	4	6	2008	16	16
ККИ	Мъж	73	H92.0	h93	Регионално	Планова	Очни болести	22	7	2008	14	34
ААА	Мъж	23	C00	A00-B99	Регионално	Планова	Очни болести	27	7	2008	14	50

Общ брой : 4

`Към Word` `Към Excel`

Fig.4. Doctors request and answers statistic for a period

Conclusion

With this project we plan to investigate and explore each factor that have an influence over the solution, to explore the healthcare system in Bulgaria in the necessary depth thus to eliminate possible shortages. Planned teleconsultations in the standard software form, in accompaniment with videoconference dialog with parallel transmission of specific medical data and images, represent a highly effective diagnostic tool. Telemedical consultations bring about less mistakes and better care through reducing information misunderstandings.

The users' opinion up to the current moment of 9 months exploitation is with high approval and satisfaction.

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