

The Web Side System for Registration and Processing Medical Data of Urological Department Patients

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Abstract – In this paper the functional application for gathering, processing and interpretation of medical data is described. The usage of this data base is possible with the access of internet and with minimal requirements for hardware. Information stored at server can be reviewed and different statistics may be created in depending of medical or epidemiological needs. The future plans of extending this data base with diagnostic module and inference engine are mentioned.

Keywords – internet technology, data base, processing of data, computer aid diagnosis.

I. INTRODUCTION

Computer measuring systems are used in medicine to improve quality and efficiency in health care processes. Personal computers have become inexpensive and relatively easy to use. The Internet technology for data exchange can be utilized from almost any office or doctor's surgery (Fig.1). This technical and socio-economic development has led to a situation when it appears to be appropriate to assume that a large number of doctors is able to access an Internet based information system and collect their medical data for their common or own usage [1]. Every doctors has also the possibility

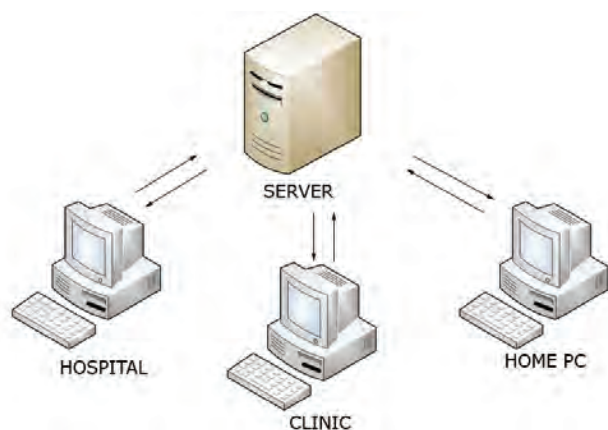


Fig. 1. The users access of database

to review and analyse medical data in their work places: hospital, clinic or home study.

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II. STRUCTURE OF DATA BASE

The information set is organized in three separate parts (Fig.2): doctors, patients and examinations tables. The table doctors includes the identifications data of all users which allows them to entrance the base. The patients table contains patients personal data and ID of their doctors. The biggest examinations table is composed of the identification part (patient, doctor and examination) and the result table (about 100 rows for every record).

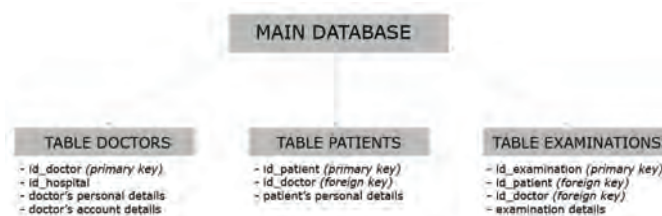


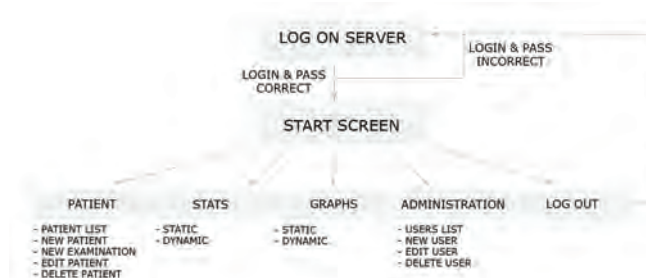
Fig.2. The database structure

Two technologies [2] have been used for establish this base: MySQL —which enables to create any data collection with additional description. It is very popular and wide range used by web-masters also because of its low cost (the licence is not necessary), and

PHP –Typer Text -the script language performed in the server allowing to dynamic generation of the web side contents.

The process of database creation is automatized by locating all commands in the file *baza.php* which is placed in the main directory at server. The administrator manages the users status and allows them to make use of all records or only of their own part. User may add/delete the patient or the result of the examination for existing item.

Fig. 3. The process of activating the usage of database



If some results of the patient are observed, the presentation is in the form of a table and all items are sorted according to date (the latest at the beginning). For handy operation the inquiry forms of a new patient is unrolled. The selected parts of

questionnaire data are presented in the Table I (i.e. the part 5. consists of 13 rows; there are near 100 rows in the full version).

TABLE I
THE SELECTED (NOT ALL) PERSONAL AND
CLINICAL DATA GATHERED IN DATABASE

1. Personal data:	
Patient's data (name, second name, surname)	
Examination's date (year-month-day)	
Code of SD/case history	
2. Anamnesis:	
Diabetes, Hypertension	yes/no
ASC (arteriosclerosis)	yes/no
Sexual activity	yes/no if NO – how many years from/since
Erectile dysfunction	severity: /1-mild; 2-middle; 3-hard
Smoking	yes/no, number of cigarettes/per day
Alcohol	yes/no, 100g drinks/ per week
Physical exercises (jogging, any sport, etc.)	yes/no, how many/per week
3. Ailments	
Chest pain, Intermittent claudication, Orthopnea	yes/no
4. Urination	
IPSS, Quality of Life	number of score
Haematuria, Urinary incontinence	yes/no, number of used sanitary napkins (<i>quantity/per24h</i>)
5. Medicaments:	
Alfa-blockers	yes/no
Blockers of 5-fosfodiesterase /Viagra, Cialis, Levitra/	yes/no
6. Physical examination	
Arterial blood pressure	mmHg
Pulse, Pulse at distal arteries	
Leg ischemia (is there any hair on patient's legs?)	
DRE (digital rectal examination)	
7. Laboratory tests	
Urine analysis	normal/abnormal
Urine bacteria culture	negative/positive
Glycemia, Cholesterol, LDL, HDL	
Total PSA (last)	ng/ml date
8. USG (ultrasonography) of the low urinary tract	
Urolithiasis/stones at upper urinary tract	yes/no
Prostate volume, Residual volume of urine	cm ³
9. Uroflowmetry	
Qmax	ml/s
Volume of micturition (urine)	ml

III. THE STATISTICS REVIEWING

The pleat *STATS* allows users to form different statistics for particular items of questionnaire and in the future also to make so called intersected statistics. The example of one of simple graph is showed at Fig. 4. All records in the database are clustered for the sake of patients age [3]. There are 74 patients: 40 of them are from 61 to 70 years old. Likewise, the diagram percentage of patients with i.e. Qmax (max urine flow) over 15ml/s can be created in this base.

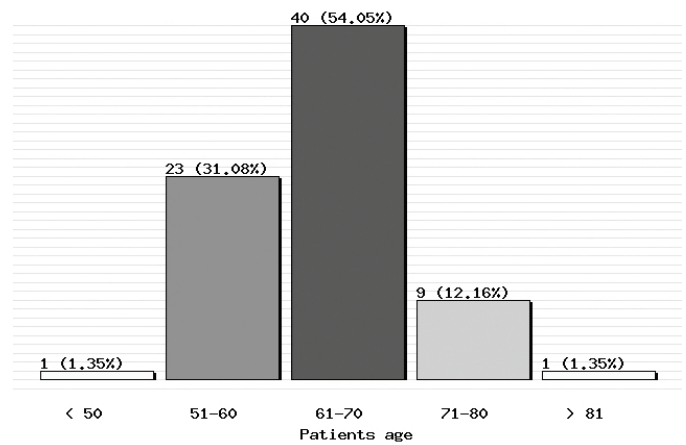


Fig. 4. The histogram of number of patients diversified in the interest of their age

IV. CONCLUSIONS

We have performed the web side system for gathering clinical data. We used the expanded inquiry forms which include all possible data represent patient cases suffering from BPH (Benign Prostatic Hyperplasia), Prostate Cancer and the other causes of lower urinary tract disabilities [4]. So far, only direct statistics are possible in the form of histograms. In near future the answer for the question: how many patients with PSA=4-5 ng/ml have big prostate volume and have BPH as the final diagnosis, can be received from described database.

The long future aim of this system is to help a doctor in a diagnosis. It has the advantage of having a large database of knowledge which can be updated (it can store more knowledge than a person).

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