Intellectual System for Analytical Data of Patients

Roman Supyk, Yaroslav Kis, Taras Batiuk

Lviv Polytechnic National University, Lviv, Ukraine

The relevance of the topic. The modern period of society development is characterized by considerable influence of information technology. Was no exception and medicine, which today has acquired a completely new traits. The introduction of electronic means of collecting, storing and processing patient information allows you to effectively handle large amounts of data without human intervention.

One of the directions of development of the medical information systems medical information systems. They are equipped with various medical institutions and their subdivisions. The composition of these systems includes automated registry, formalized medical record, reporting and analysis of attendance, morbidity, preventive examinations, health examinations, temporary disability, vaccinations, formation of the entire reporting and statistical documentation on the activities of the clinic.

In connection with the rapid accumulation of medical data, particularly the acute problem of applying data analysis and subsequent prediction based on them. In turn, the need to identify hidden trends in the spread of a certain disease, revealing non-obvious relations between the factors causing it and the subsequent prediction of possible development of events every year becoming more and more clear features. Very relevant seems the study of the database of patients that will facilitate the process of health care management timely and accurate information.

The purpose of the study. The aim of this work is the establishment of the monitoring evaluation system of diseases and application of intelligent data analysis to detect hidden complex relationships between diagnostic data of the different groups of patients.

The task which the system must solve is the development of modern information and analytical system of monitoring of the health status of the population, which will contribute to the development of adequate strategies for the preservation of the health of the population and prompt solution of current issues of managing the health system.

To the major tasks to be submitted for the master's qualifying work include:

- Determine the specific requirements for the information analysis.
- Study of existing solutions and approaches.
- Learning approaches to analyze data using OLAP technology.
- Direct use of tools of research tasks.
- Analysis of results, assessment used and studied approaches, the definition of advantages and disadvantages of the developed solution.

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The choice of methods for solving the problem. Technology of complex multidimensional data analysis has been called OLAP (OnLine Analytical Processing). The reason of using OLAP to query processing is the speed. Relational databases store entities in separate tables, which are usually well-normalized.

Technology OLAP helps the user perform various analytical operations such as consolidation, drill down, data slice, cube rotation etc. In this case, OLAP cubes create a modern database management system (DBMS) based on relational database tables and they do not have is a cube on a physical level.

Class methods Data Mining (data mining, data mining) - a set of detection methods in data previously unknown, nontrivial, practically useful knowledge needed for decision-making. To such methods, in particular: learning of associative rules (association rule learning), classification (branching into categories), cluster analysis, identification and analysis of deviations, and the like.

Association is the discovery of certain relations between objects. The combination of objects is called the associative rule - for example, if the appearance of a set of objects in a database closely associated with the emergence of different feature sets, these two sets are called associated.

Classification is the most simple and common task of Data Mining. The solution of classification tasks show signs that characterize a group of objects of the studied dataset classes; on these grounds a new object can be attributed to a particular class. To solve the problem of classification can be used methods are: nearest neighbor (Nearest Neighbor), k - nearest neighbor (k-Nearest Neighbor); bayesovski networks (Bayesian Networks); the induction of decision trees; neural networks (neural networks).

During the design of master's qualification work has been investigated the application of data mining patients. First of all, we found specific to this field demands, then proceeded to study existing solutions and approaches that are most often used to achieve the goals. Characteristically, we stopped on the problem of classification, which gave us the ability to efficiently conduct the study.

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