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INSTRUMENTAL COMPUTER SYSTEM FOR DISTANCE LEARNING

The structure of the system for the study of notions and terms of subject domain with an unclear structure is considered, in particular, the structure of data-base system. The proposed system allows to create new educational courses regardless of subject domain, to automatize teaching of users after these courses, to carry out diagnostics of knowledge and manage teaching. The system provides the possibility of the independent study of notions and terms of a several disciplines, the support of the simultaneous teaching of a several users, the verification of rightness of pupil's answers of pupil on a template, the addition of new educational courses without modification of the code of the program, the use of the editor of educational courses.

Keywords – computer technologies in education, computer educational systems and environments, distance learning, data base, knowledge domain, pupil model.

1. Introduction

One of the ways of the use of information technologies for the purpose of learning concepts and terms in some knowledge domain is the implementation of the distance teaching conceptions, that is to say teaching in distance, and computer teaching systems and environments as the elements of distance teaching. Computer technologies provide effective reverse connection for both the organization of teaching materials and the communication with the professor conducting the course [1].

On the other side, the computer teaching systems and environments, having been successfully developed and implemented into the teaching process for more than three decades, are becoming adaptive due to the use of the pupil model and also more and more intellectual since they are carried out as the expert systems, and the data base of these systems is separated from the universal cover of the system [2].

The use the Internet helps to combine these two approaches applying the computer systems as the main element in the distance teaching systems and to provide the distance systems with the characteristics of intellectuality and adaptability [3].

2. Setting the Problem

The system is created for the purpose of learning concepts and terms of the chosen knowledge domain and working out new teaching courses in Internet setting. It is intended to work out teaching courses for different academic subjects, every course is designed for the certain amount of lectures including test questions. The system calculates the number of correct points and correspondingly provides or does not provide the user with the opportunity to pass to another lecture. On condition that the pupil has completed the study of the chosen course, the system provides him with the opportunity to continue his studying another course. The users are to have different passwords at the entrance to the system since there is the model for the course study of every pupil in the data base of the system. If the user is registered as the expert of the system, the program must provide him with the opportunity to edit the existing courses and work out new ones.

3. The Description of the Structure of the System

The structure of the system can be presented in the way of five constituent parts.

Clien is html-page used to display the information on the monitor of the pupil (the demonstration of the teaching material in the form of the set of terms and their definitions) and to transfer the data to the *Server* entered by him.

Server is the file creating the client's html-page, processing the data entered by the pupil, transferring the number of the assignment and the answer of the pupil to *Diagnotor* (the program for checking the pupils answer) and also controlling the process of teaching (letting the pupil pass to the next lecture). To test the system (without the use of Internet) the connection with the Windows's component IIS (Internet Information Services) is created.

DB (DataBase) contains the information about courses, test assignments, pupils and experts.

Diagnotor is the com-object (in the form of dll-file) checking whether the answer of the pupil is correct and transferring the number of points obtained by the pupil for the fulfillment of the assignment to the *Server*.

Editor is a separate part of the system working only with the data base and using for working out and editing the teaching courses.

The data base consists of eleven main tables and two tables relating to the courses. While working out the course, the data base is added with the tables relating to the courses which will be worked out later.

The table *Diagnotors* contains the data about all diagnostic programs – the programs for checking the system user's (pupil's) answers and the information needed to contact them. The table is filled with the information by the expert. The *Courses* table describes all the teaching courses existing in the system (the title of the course, the author, the date of working out the course). The information is entered by the expert with the help of the *Editor* program. The *Users* table contains the information about the users of the teaching system. The teaching courses being studied or having been studied by the users registered in the system are described in the *Pupils* table. The information is entered in the table with the server part during the registration of the user having chosen the course of study. The *Experts* table presents the information about the experts-users provided with the opportunity to change or add the courses. The information is entered in the table by the expert. The *CourseStructures* table contains the information about the teaching materials (the title of the lecture, the name of the lecture's file).

The information is entered in the table by the expert with the help of the *Editor* program. The *ModelStructures* table shows the structure of the pupil model table (the titles of the pupil model fields for every course), that is to say it is the table with the fields on the basis of which the table of pupil model is created (the table of the information about the pupil's knowledge). The information is entered in the table by the expert with the help of the *Editor* program on the basis of entering data about the course.

The *Tests* table is the description of the test assignments, answers, points for each question and the titles of files of test assignments. The types of test assignments for every course are stored in the *TestTypes* table (e.g.: the set of answers from the suggested ones). The information is entered in the table by the expert. The *ControlWorks* table contains the course paper for every lecture according to the course of study. The information is entered in the table with the help of the *Editor* program on the basis of the data about the course entered by the expert. The *ActionTypes* table contains the types of actions in certain combinations of studied courses. The information is entered in the table with the help of the *Editor* program on the basis of the data about the course entered by the expert.

To create the data base the client-server architecture for MS SQL Server 2000 has been chosen. The interaction between the server and the client-program is conducted in the following way: the client makes the request and sends it to the server. After receiving the request the server processes it, probably applying to DB server, and returns the result to the client. Mainly, the interpretation of data received from the server, the realization of interface with the user and the entrance of the data take place in the client program.

4. Conclusion

The scheme of access providing the registered users (pupils) with the opportunity to choose the course of study has been carried out in the suggested teaching system. In case the user is registered as an expert of the system, he owns the rights to change the courses worked out before, to create new teaching courses, to delete the courses. The system ensures the opportunity of independent concept and term studies in several domains, the unrecurrence of assignments, the support of several users' simultaneous teaching, the verification of the rightness of pupil's answers on a template, the addition of new educational courses without modification of the program code, the use of the editor of educational courses.

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