

# The Design and Realization of Net Testing System on Campus Network

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**Abstract:** According to the requirement of modern teaching theory and technology, based on software engineering, database theory, the technique of net information security and system integration, a net testing system on local network was designed and realized. The system benefits for dividing of testing & teaching and settles the problems of random testing paper. In this paper, system structure and main function, database designing, database programming and system integration and maintenance were introduced.

**Key words:** local network; net testing system; system design; system integration

The full speed development of the computer technology promotes the arrival of technical revolution of information, and makes the society enter a high-speed period of development. Facing the high-quality requesting to the talent of society of 21<sup>th</sup> century, the university computer education also faces new challenge and opportunity. On one hand, traditional teaching method and means can't meet the development of the computer science and technology; on the other hand, the computer technology which is advancing rapidly has offered the favorable tools in order to improve teaching means of every courses and examination method too. Therefore, teaching in different fields are vigorously reformed and explored by utilizing modern teaching means in countrywide university. But we should know clearly that an important segment of the reform of fundamental computer education--Course examination already becomes emphasis of the reform of teaching and an important breach which improves teaching efficiency too. The individual examination system of each course can't meet demands of examination yet. Exploring a common examination system which suits for many courses has a strong adaptation. Linking with campus net closely is a primary task, and it becomes the urgent subject to be solved for every teacher who bears basic computer course too. Systematic function structure, mode of examination (Browser/Server), designing and programming of database, integration of system, test and safeguard of system etc were related in detail in the article about net testing system on campus network.

## 1. The Overall Function Designing of the System

Rational module designing make systematic structure clear and accord with logic, and easy to use. High-quality divided modules should make little connection among modules. According to the basic logical procedure of examination of the network, the system is divided into exam questions management, students management, question sheet system, testing affair management, files management, users management, system integration, etc.

(1) Management of tests :examination question management has the functions of setting-up of the exam pool,

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inputting and modifying the examination questions and consulting answers, which includes recording and modifying of the course code, the difficulty of examination question, subject content, reference answer and so on. Six kinds of questions are established in system: multiple-choice questions, judging questions, question of filling a vacancy, correcting questions, reading/writing procedure questions.

(2) Management of students :Student management provides the functions of inputting, browsing, revising and deleting students' information etc. Some channels have been set up in order to get many kinds of outside data source, for instance, the text file, Excel form file, etc. Setting many kinds of data inquiring and browsing through terms of making up while having a look around and revising information, it is convenient to the accurate localization of student's information correctly. According to the test subject and establishment of this subject paper structure that established by system meanwhile, system will automatically take part from whole questions and examination papers, also form table of students' paper.

(3) Answering system : Students register the server of examination on Telnet by inputting their number and then go on the question of the examination. System has been considered that there are a great deal of unexpected circumstances, adopting affairs rollback mode in order to guarantee accuracy and immediateness of examination.

(4) Management in examination : Mainly including such functions as the set of system's server, the set of the course of examination, the set of paper's structure, reading paper by teachers, managing results, the feedback of test's difficulty and so on. While in the module of set of test's difficulty, the requirement of controlling test's difficulty increased.

(5) Management of files: Realizing the backup of the database, making Word test, 10 sets of Word tests can be produced automatically once by users in this module.

(6) Management of users: Mainly including such functions as the register of the new users, revising user's password, users' cancel, guaranteeing all users' legitimacy.

(7) System integration: Under the support of environment of handling official business integratedly, under the main interface of system, sets of software of Office 2000 has been integrated (Word, PowerPoint, Excel). At the same time, the daily tools of board and the equipment of the resource management have been integrated in system.

## **2. The Key Technology of System Development**

### **2.1 Web Browser/Data Sever of SQL Server 2000**

The server of application program includes unitive interface, business plan and the logic of data processing etc. which has guaranteed that the business rule and the logic of data processing which is concentrated on server is managed unified, client sever needn't carry on complicated calculation, which will not influence on other users because of wrong operation either. It has improved system dependability, stability and efficiency, and has reduced the cost of safeguarding. Considering system's actual need in the examination of the network and actual conditions of the computer center of our school, the system adopts IE browsers and IIS/ASP (Internet Information Server/Active Server Pages) servers of Microsoft Company.

Microsoft SQL Server is a relation database management system (DBMS), which developed and popularized by Microsoft, it has high performance, highly reliable and the advantage of the expandability, it can be used in the

large-scale online operation, data warehouse and e-commerce. Abundant programming interface tools, good user's function of log-in controls and elasticity, inquire about the scalable relation database of the language (SQL) on the basis of structurization, having integrated and supported the extensible markup language (XML) of Internet application program, having offered security tools of the built-in (such as the safe framework, plan security, establishing safe accounts, the management of accounts, administrating authorities, advanced safe subjects, examining and verifying SQL Server activities) etc. It is real client/server system structure, meeting the needs of the management of the test storehouse of examination system on campus network totally.

### **2.2 The Designing of Database**

The designing of database can be divided into four stages: demands of analyzing, the designing of conceptual, designing of logic and designing in physics.

The task of designing of conceptual is on the base of the defining dictionary of data, the defining of the database application of operating task which is produced in demands of analysing, confirming contacting of entity in system, and showing message mode of the system with E-R model, connected chart with synthetically. The task of the designing of logic is designing and producing a mode of database of designing of logic which database can deal with, according to the operating of data which is produced by demands of analyzing and mode of data of conceptual which is produced by designing of conceptual.

According to the above-mentioned basic theories of related technology of the database, the designing of every database follows four processes. "The demands of analysing→The mode of the designing of conceptual →The mode of designing of logic→designing in physics", among which the designing stage of the conceptual mode in the structure designing process of the database adopted the entity- the contacting way ( E-R method ) to describe and define, while standardizing the data, having followed the principle of rank which try to improved the relation of data, in order to reducing the redundant data, improving the efficiency of depositing and withdrawing of the data. The designed table in this system is that students' information table, the subjective form of the test, the objective form of the test, setting form of the course, the structure form of the paper, the parameter form of the system, the achievement form of students and so on.

### **2.3 System of Integrating**

As the application software being complicated constantly, maximization, networking, the technology of the system of integration developed at full speed. At present, the system of integration has already become the major mode of developing large-scale application softwares. The system of integration is not only hardwares of the computer, the more important thing is to integrate information, various kinds of application softwares, tools, supporting softwares etc. The software utilizes the technology of the system of integration, is on Windows 2000 / XP operating system and Web/Server running environment, integrating information and the system of the database, various kinds of mathematical operating models, the technology of the human-computer interacting and Office 2000 as an organic whole, forming an opened and systematized application software which is based on network examination system on campus network.

### **2.4 Testing and Maintenance of the System**

The purpose of software testing is to look for, correct various of softwares' mistakes (including logical mistakes, code mistakes, assembling the operation mistakes etc.) and check the function and natural capacity of the software which reaches the requests or not. Because this software is an application software, on the base of adopting the method of random test, artificial test and programmer test by their own and so on. Finally, adopting the directly perceived method of the data to be operating and checking to contrast their operation results to do

scene tests, which is the most simply and easily method in testing application software too. So the practicability and dependability of this software is appraised ocular and convenient.

The maintenance of the software means that modifying the software in order to improve the exactness, dependability, adaptability and perfecting of the software products, the maintainability and maintenance efficiency of the software are one of the important indexes in weighing the software whether it has a good or bad quality. This software has been fully considered that system maintainability, for instance, adding users, unit/network running environment, software operation and initialize arrangement along with the maintenance of the code etc., which has undoubtedly improved software maintainability greatly. In additional, having also set up the exhaustive and convenient function of help and study, which makes users to do essential maintenance to the software more easily. The maintenance of the software is a long-term and important work, debugging and perfecting (upgrade) the software constantly, and to strengthen the communication with users is the base of any software keeping their vitality.

### 3. The Character of System Application

Using system initially in relevant specialized subject of our school shows that it has the character of security, commonability, stability, automation, easy to safeguard, good popularizing, opening and accident dealt with and so on. By the means of thickening to paper, test, result and students' information, adopting the means of paper organizing of parameters/tactics to replace the simple way of taking test from examination question bank, which can organize paper to examine examinees more scientific, and prevent the examinees' behavior of fraud effectively. Meanwhile adopting the monitoring system of the examination and the system of verifying examinee's identity, the security and fairness of the examination is more effective assured. It is very flexible in organization and maintenance to some structure of knowledge, the type of the examination contains overall, using simply, and it can be used in the examination conveniently. According to modules, it is divided strictly and leaving room for its expanding and perfecting. Students' information management, organizing paper, objective question perused are all automatic. It is simply to safeguard client server, install server, can count various of analyzing data, reflect the teaching result overall. As the reference of improving the teaching, it can also contrastively count the horizontal or vertical to lots of examinations, fully show relevant information. The system can be recovered safely in case that examination unable to go on normally which is caused by cutting and halted, and allow students to log-in system twice and continue the examination. It can deal with the achievement of the network edition alone to the unusual network data transmission. System development is combined with the society needs closely, according the state policies and development goal and identical with modern teleeducation projects, the school-to-school projects, information technology popular projects.

In a word, the development of system will make campus network application of our school and in the way of the no-paper examination which adopting the modernized means newly breaking, impelling the examinations' work standardization, fairness and scientific, improving the work efficiency of the examination greatly. This achievement plays a positive role in promoting the scientific process of teaching management of our school.

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