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# Design and Development of the College English Test System Based on Network

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**Abstract:** With the entity of global economy, social reform and the development of English education, English test has already become an focusing part in higher education. Because of the important status of English and exam scale, Computer Assisted Testing (CAT) undoubtedly is an convenient and rapid way. However, ordinary machine test has its limitation, so the design and development of the College English Test System based on network has become must. This system introduces 3 layer of mixed C/S and B/S module. Delphi programming language is chosen and SQL Sever 2000 database is used as the development too. This study analyzes the structure of system function module and studies the technology of drawing exam questions and at the same time we emphasize the paper marking strategy of English translation subject.

**Key words:** Computer-assisted testing, database building, paper-marking, test system

## INTRODUCTION

With the progress of internet technology and its extensive application, as well as the further development of internet and school net, achieving autonomy of English learning, networked of English practice as well as test, has become the necessity and trend in college English education development. College English as public module for non-English profession students, during the popularization of online education, but tests still follow the traditional lecturer monitoring examination and students mainly sit for the written tests. Many universities do not have a comprehensive English testing system for themselves. Consequently, developing college English testing system, decreasing testing cost, resolving heavy examination work, decreasing the workload of assessing paper, improving the work efficiency, conducting objective analysis for testing paper and providing the valid basis for enhancing the education quality, which is a exploration of college English education innovation and English language learning test, also plays an improving role and applied value in college English educating module construction, innovation, as well as for teacher self-development (Bachman and Palmer, 1996).

CAT (Computer-Assisted Testing ), also named as computer-based testing, which means with the assistance of computer to evaluate the students' learning outcome and learning capacity, divides into two methods: online test and single machine test (Bachman and Palmer, 1996).

## System design
**System structure design:** According to the system structure analysis, in this system it will adopt 3-layers structure of C/S and B/S mixed model. Students take exam, pick up questions, answer as well as upload the result choosing C/S local area network, fore and background only pass search request SQL (Structured Query Language) sentences or search results. Hence, data communication volume is small, speed is fast, function is intact, interaction is strong, boundary is friendly and safety is high, which is what B/S is lacking of. However, teachers still try to maintain for the test questions, assessing subjective questions of testing paper, paper analysis and management part after uploading the result, namely result search, statistics, print and release and so forth flow. They choose B/S mode, because B/S is a cross platform and it will multi-point and multi-point to multipoint applied software structure and it owns consolidated browser client-side software, decreasing the developer's workload in client-side, organize the information rationally, provide service to consumers.

**The design for system function module:** Wang (2001) proposed that a complete English examination system should do the work of three stages: pre-test, in the test, post-test. It is also named as: forming the paper, testing, assessing paper and analyzing the result. After the adequate system analysis, combined with practical work, the system should complete the main functions as following:

- Having the function of user-management, verification of identity, maintenance of student information (addition, modification, deletion), the back-up of database (question bank, examination result), the maintenance of teacher information (addition, delete,
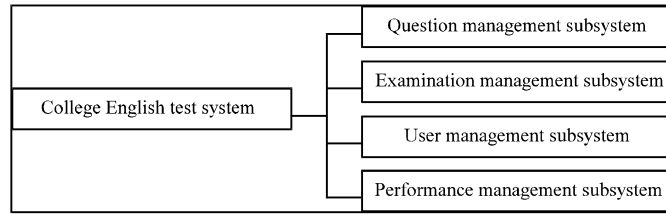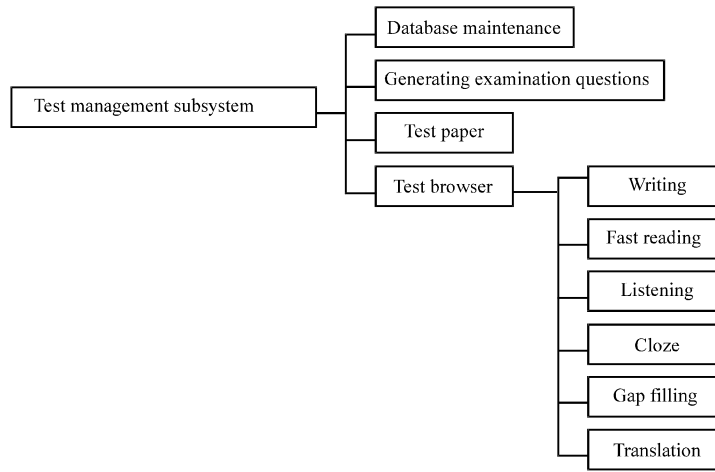
Fig. 1: System functions module diagram



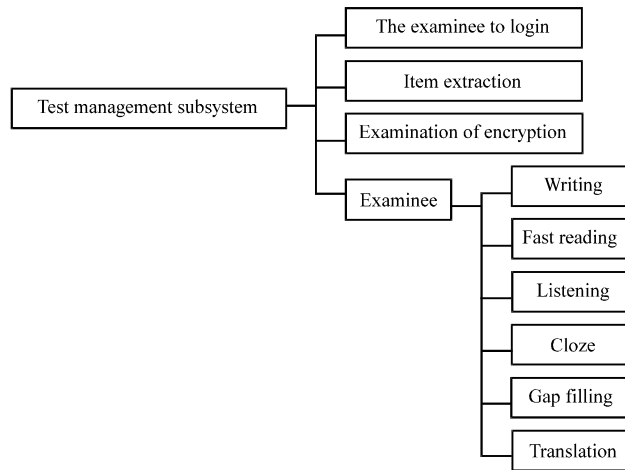Fig. 2: Exam management subsystem module structure



Fig. 3: Exam management subsystem module Structure

authority distribute). For example, the authorities of question type-in and edit permissions, forming the exam paper, limiting the examination room and machine replacement

- Having the function of teacher-management, identity verification, the test question type-in, editing,

maintenance, assessing the subjective questions and logging the grade, forming the chart and exam paper back-up, analyzing the paper, printing the analysis chart

- Having the function of student answering questions, identity verification, picking up question, question

encryption, exam time keeping, answering and answer modification, back-up of answer, forming the question folder, submit the answer folder

- Having the function of exam-paper management, forming the exam paper randomly, forming the exam paper artificially, producing the sample paper and creating exam folder
- Having the function of grade management, adding up grade, search result, print result

According to the system function demand as mentioned above, the system can be divided into: question management subsystem, examination management subsystem, user management subsystem and scoring management subsystem. System functions module diagram, as shown in Fig. 1.

Each subsystem could be a complete system independently and possesses intact function. Subsystem depends on mutually and forms the intact system. User management subsystem authorizes teachers to renew and maintain test subsystem, assess students' grade of subjective questions as well as log the result in data chart respectively in result management subsystem, managing the registered students to take exams. Exam subsystem includes all the questions of the system function module in Fig. 1 and provides the question paper for exam management subsystem and organizing the paper. Grade management subsystem in accordance with exam management subsystem forms the students' answering folder and sums up the grade objectively, combining the subjective question results to obtain student's results, providing search, statistics, print and analysis. Via grading management subsystem , achieving the objective question result in client-side, withdrawing the objective question results, uploading the result to the server, teachers take students' writing answers in the server and download to structure chart as Fig. 2 indicated, exam management subsystem module structure chart as Fig. 3 indicated.

**Designs for database chart structure:** Wang (2002) stated that in the progress of designing system, the most important step is the design for using SQL Server 2000 as database for applied program. According to the following need analysis, the system database test DB mainly consists of the following entities, students, teachers, examination personnel, writing questions, fast reading questions, listening, gap filling questions, translation questions, exam paper and students' grade.

**Students' main attributes:** examine number (major key), name, department, grade.

**Teachers' main attributes:** Serial number (major key), name, department, authority.

**The writing question main attributes:** (Major key), question type, questions, text pathway, question chart pathway, answering timing, save student answer pathway.

**Fast reading main attributes:** (Major key), question type, text pathway, A option content, B option content, C option content, D option content, difficulty index, standard answer, student's answer.

**Listening question main attributes:** D (major key), question type., text pathway, listening folder pathway, question chart pathway, answer timing, A option content; B option content; C option content, difficulty index, standard answer, student answer.

**Gap filling question main attributes:** ID (major key), question type, text pathway, blank, words, difficulty index, standard answer, student's answer.

**Cloze question main attributes:** ID (major key), question type, text pathway, A option content; B option content; C option content; D option content; difficulty index, standard answer, student's answer.

**Translation question's main attributes:** D (main key), question type, question, answering timing, save student's answer pathway.

**Exam paper's main attributes:** Exam paper serial number (main key ), name, question type, number of question, score, exam timing.

**Student result main attributes:** Exam number (main key), name, exam serial number, score of writing question, the score of fast reading question, gap filling question score, cloze score, translation question score and total score.

**System application technology research**
**To achieve test extraction technology:** The purpose of machine examination is to fulfill the complete and random item generation. The system adopts random repeated sampling technology in the generation of multiple choice questions. And the use of ADO data access technology as the interface, creates ADO Data control, uses the connection string data to the master database corresponding all kinds of subject information extraction examination questions in the table, consisting of a set of scientific and reasonable college English test.
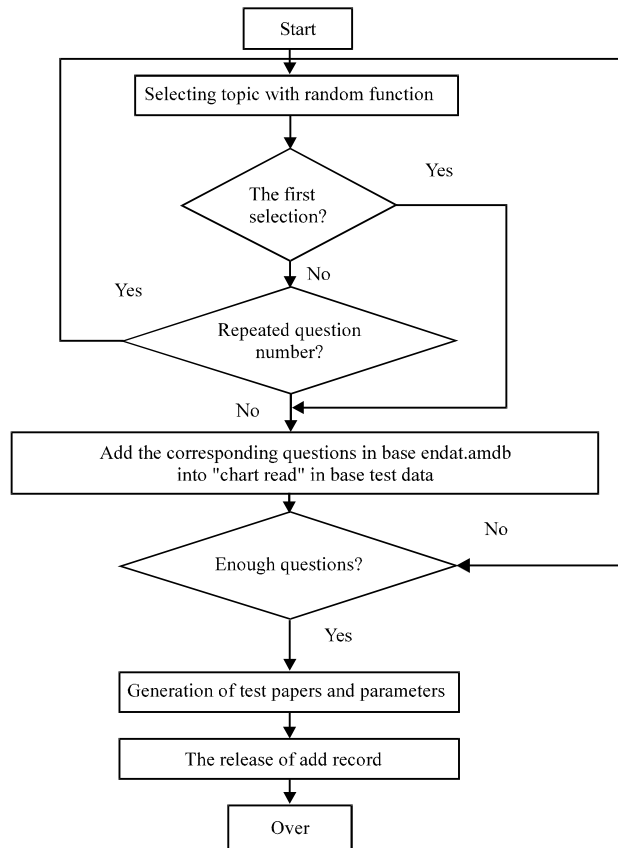
Fig. 4: Fast reading topic extraction program flow diagram

Taking the extract process of fast reading question for example, adding 5 and 6 Adodc controls respectively. To set up Connection String attribute use/connecting number mark 0 option. Connecting to question chart of fast reading of database and test table of E testdb; two controls set the Record of Source properties are the same. Select/Order type 0 as 2-ad Cmd Table 0. Choose the fast reading database table/READO table as the record source, to determine the properties of the control list as shown in Fig. 1. Fast reading topic extraction program flow diagram as shown in Fig. 4.

**Marking strategy for translation:** The automatic scoring for translation is a key problem in the system. It involves the lexical analysis, artificial intelligence, pattern recognition and other aspects of the problem (Guan and Yun, 2006).

In the process of manual marking, teachers clearly understand the scores of vocabulary and complete statement. When correcting the paper, the teacher first checks some of the examinee answers and score the vocabulary. The more match the point has, the higher grade the student has and then the answers and standard answers in the similar degree of expression are considered. The more similarities the answer has, the higher grade the student has. And finally, the appropriate adjustment of the score is conducted according to the examinee answers considering the factors such as the smooth syntax and strong organization. According to the above analysis, we can find that there are two main factors influencing translation scoring, one is the number of scoring vocabulary and the other is the similarity of the examinees' answers and standard answer. The processing to the scoring points can be conducted by language points and keywords . The specific method is that every scoring point is transferred into the keywords and then the mark is calculated by judging the keywords of the examinees' answers. The similarity of modification can be described with the concept of one-way approach degree. At last, according to the ratio of key words and similarity, we can calculate the final grade (Qu *et al.*, 2003).

According to the above analysis, teachers can regard the scoring points of the examinee as the main basis of getting mark. In this way, it should be asked to put the
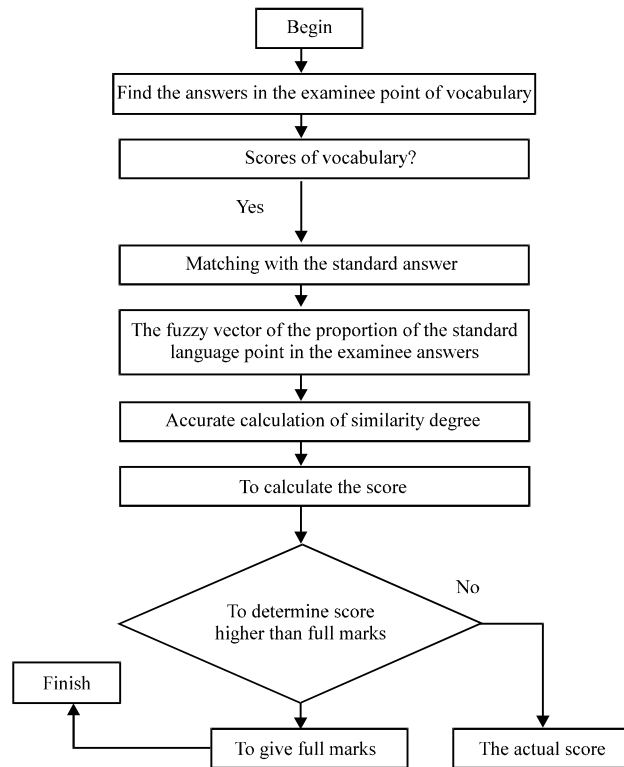
Fig. 5: Scoring program flow chart for translation

standard answers to a few key points and compare with the examinees' answers. This paper will take string S1 and S2 as example and introduces the calculation of the string s1 is close to S2 one-way similar degree S(S1,S2), as following:

- The search string S1 is decomposed into single valid characters L1, L2,,, Ln.
- Judge character after the S1 decomposition is included in the query string S2. Suppose that the search string is the same order before and after the decomposition, so we can not simply judge by the inclusion. In this essay, it is whether the first character L1 is included or not in string S2, if it does not contain marked as 0, otherwise, it will mark as 1. And L1 characters from S2 will be removed. The same process is performed on the L2 in the second word, until L1, L2,,, Ln, determine the end (Zhang, 2004a)
- Calculation of one-way degree S(S1, S2). Calculate the single character after the s1 decomposition L1, L2, , , Ln. In the sum of number of the ration in the s2 and account for s1 of total effective number of character n, record as S (S1, S2) (Zhang, 2004b)
- According to the above analysis, the program flow chart is designed, as shown in Fig. 5.

**Data backup:** As Database failure is inevitable, in order to reduce the loss to the minimum extent while accidents, a regular backup to database and database run log should be conducted. The backup process of the design and testing of SQL Server database is prevented by medium, operation system, software and other safety measures data files caused by serious damage (Wehde, 2000).

The system uses SQL Server 2000 and provides backup function for backup. In the ordinary course of events, system administrators need to manually back up data on a regular basis. During the frequent database operations, automatic or manual backup should be done everyday. Backup includes database backup and database backup operation. When a failure occurs in the system, it can use the database and transaction log to restore the database.

## CONCLUSION

With the rapid development of computer and network technology, the traditional education mode needs changing (Wu, 2008). In order to adapt to the new exam mode, we must reform the examination mode. In the realization of college English test in universities and colleges, the exam mode of design based on network for

Universities, scientific English examination system, it is a challenge for college English teaching reform work (Liu, 2004).

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