

Design and Implementation of Assessment Report for NCRE Level One

In 2006, NEEA (National Education Examination Authority) has developed its first “Eleventh Five-Years Plan” since the establishment of the authority. In this “planning”, NEEA has proposed a new development goals — “from the center of pure test providers to focused examination and assessment agencies”, and made it more clear that " expand its services space to build a service system for the examination and assessment "is one of the 10 important tasks for NEEA in the next five years. At this background, the National Computer Rank Examination (referred to as NCRE) researchers basing on the examination itself, a careful analysis of the characteristics of NCRE examinations, recovery performance of the test, the candidate's needs, design the assessment report NCRE Level One.

Introduction of NCRE Level One

NCRE is organized by the NEEA, facing the society, intended to assess the examinees' knowledge and performance in computer application and provide a grade fro each one who has passed. NCRE is promoted the mission of popularize universal technology of computer applications from its the creation. As the end of 2008, NCRE candidates a total of 28.74 million and 10.73 million candidates receive those certificates.

NCRE assessment which is based on micro-level knowledge and use of basic computer office software and the Internet based basic skills, divided into Level B, Level One of MS Office and Level One of WPS Office. Level B and Level One of MS Office is based on Microsoft's office software to designing the test subjects, while the Level One WPS office is based on the Kingsoft WPS Office software to designing test subjects.

The current Level One test is a paperless examination; the examination time is 90 minutes. Test machine's operating system is Windows XP Professional, office software uses the Microsoft Office 2003/WPS Office 2005, Web browser uses the Internet Explorer6.0, e-mail software uses Outlook Express6.0. The number of level one's candidates is about 1.26 million, accounting for 30% of annual number of NCRE.

Introduction of the current NCRE Scores system

NCRE as a criterion-referenced examination, the scores of the report system is divided into three different sections - for the Level One -- a paperless test, the Candidates has passed the computer skill test can get a certificate; for the Level Two and Level Three, Candidates who has passed the paper test and the Computer skill test are qualified to obtain a certificate; for the Level Four, the Candidates should pass the paper test to obtain the certificate. In addition, when candidates paper test results greater than or equal to 85 points, while his Computer skill test results greater than or equal to 85 points, the students receive outstanding certificates.

Since 1994, NCRE, after each test, print and send certificate of the corresponding level and the subject to each candidates who has pass the examination, but also send the results notice information of the paper test and computer skill test to the candidates. And providing the results query and certificates query on the Web site of NEEA.

Feasibility study of designing assessment report for Nation Computer Rank Examination (NCRE) Level One

1. Paperless Examination

According to the 2008 version outline of NCRE, each subject of Level One is based on paperless examination. Examination results are given by the score software automatically.

First, this requires the proposition teachers test the system in order to give points for each accurate knowledge, in the test result database does not exist any point that can not be scored.

Second, automatically score software analysis the answer information of the candidates and the answer results of the candidates to give the correct score.

As the result of the assessment report to the candidates is based on the answer information and the answer results of candidates corresponding the question point, we can simply add some assessment function module to the automatically score software to design the assessment result of NCRE Level One for the candidates.

2. Analysis of candidate attributes

According to related statistics, more than 80% of candidates are non-computer-related students; the current Level One of candidates is more the trend of younger age. These parts of the candidates were not familiar with the computer. There are a great needs for a corresponding assessment report which will prompt efforts to the next direction.

3. Analysis of question types

MS Office of Level One have six types of topics, the full mark of the test is 100.

(1) Choice questions (exam the basic knowledge of computer science and computer networks science)

Choice questions to assess a candidate's basic knowledge of computer science and computer network science. Choice questions score is 20 points, the main point of evaluation of knowledge is as follows:

- i. The concept of the computer type and computer application areas; the configuration of computer system and the major technical indicators.
- ii. Expression of computer data: the concept of the binary, the binary expression of integer , the expression of Western ASCII character code and their coding (International code), data storage unit (bit, byte, word).
- iii. The concept of computer viruses and virus prevention.
- iv. The Components and functions of computer hardware system: CPU, memory (ROM, RAM), as well as commonly used input and output equipment's

functions.

v. The composition of computer software systems and functions of software system.

(2) The skill of using Windows operating system

The skill of using Windows operating system scores 10 points, the main evaluation points about knowledge is as follows.

i. The basic concepts of operating system, such as the functions, composition and classification.

ii. The basic concepts of Windows operating system, common terminology, documents, file names, directories, directory trees and paths, etc..

iii. The basic operations and applications of Windows operating system.

(3) Word operation

Word operation occupies 25 points in the test; the main point of assessment of knowledge is as follows:

i. Basic concepts of Word software, Word basic functions, Word operating environment, start and exit this software.

ii. The operation of the document such as create, open, and basic editing, text search and replace, multiple windows and multi-document editor.

iii. Document save, protection, copy, delete and insert.

iv. Font formatting, paragraph formatting, page layout designing and other basic typesetting operations. Print Preview and Print.

v. The operation of Word object: the concept and the types of objects, graphics, image editing objects and the use of text boxes.

vi. Word forms production functions: the creation and modification of form, the form of data input and editing, data sorting and calculations.

(4) Excel operations

Excel operations earn a title score of 15 points, the main point of evaluation of knowledge is as follows:

i. The concept of Excel sheet, Excel functions, operating environment, start and exit the Excel software.

ii. The basic concepts of table and sheet, the work of table creation, data entry, editing and typesetting.

iii. The work of the sheet insert, copy, move, rename, preservation and protection of basic operation.

iv. The concept of absolute address and relative address, inputting formula into the working table and the use of common functions.

v. The concept of data list, the use of records, sort records, filter, search and classification summary.

vi. The chart creates and formats settings.

vii. Worksheet page setup, print preview and printing.

(5) PowerPoint operation

PowerPoint operation of a title score of 10 points, the main point of evaluation of knowledge is as follows:

i. PowerPoint functions, operating environment, start and exit.

- ii. The operation of create, open and save.
- iii. View the presentation, production of slides, text layout, insert pictures and graphs and use templates.
- iv. Slide insert and delete, change the order of presentation, set the slide format, set the slide show effects, the insertion of multimedia objects, presentations package and print.

(6) Simply use the browser and e-mail

Operation of a network of 10 sub-title score, the main point of evaluation of knowledge is as follows:

i. The basic concepts of Internet Explore and the main methods of the IE access internet.

ii. The simply use of the browser and e-mail software.

We can see from the above analysis, each type NCRE Level One question can be divided into specific knowledge of the assessment points, and the knowledge score in the examination system is operational records of the candidates specific analytical process. Proposition teachers each life test system for the corresponding points are scored and the score to describe specific rules, as long as can be drawn on the basis of these candidates have the knowledge points, and in accordance with the situation in the country are given an objective examination of the evaluation report.

4. Analysis of the pilot NCRE Level One assessment report

Under the present situation I design an assessment model. This model is based on the existing categories of questions to provide the assessment report. It is based on the above six categories. In the model we only provide the assessment of categories and do not provide the detail information under the categories. Automatically score system can give any information about each part of NCRE Level One test. So we can simply dig the candidate's data and analysis the score of the nation to inform the test taker his performance through the assessment report. The method is simple and less experimental preparations.

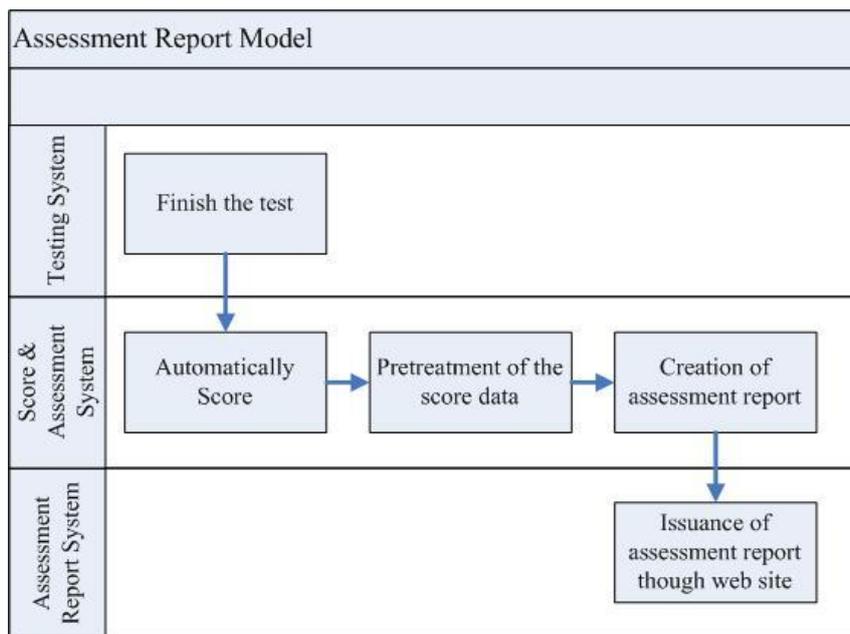


Figure 1 module diagram of assessment report software

The design of the assessment report

The design principles of the assessment report

The assessment report is a new reporting format based on the original certificate of competency and the notice of the results, together constitute the reporting system of NCRE Level One evaluation. Therefore, its style should be in the form with both, but the contents of the assessment report should be able to provide more personalized information. Specifically, the design of NCRE Level One assessment report follows the following principles:

Highlighted the features of NCRE

As a criterion-referenced level examination, NCRE mainly candidates the test taker who meet the eligibility criteria, therefore, the contents of the evaluation report should be stressed on the point where qualified candidates passed or exceed standards. Based on existing information, provide a wealth of information

Results database of the candidates has a large number of information to be researched and used, research results of the candidates can base the depth of information for data mining, which summarize and inference skills of candidates in different strengths and shortcomings, to help its targeted the conduct of subsequent studies.

Easy to understand, and stress practical

The contents of the assessment report should be structured layout, functional clarity, reflecting the idea of the report; At the same time, to make full use of graphics, tables, etc. to illustrate, using simple language, avoiding jargon, so that students can easily read this report.

Solemn layout, color coordination

As a part of result reporting system, the layout of the assessment report should be achieved with the form of the certification and the notice. Taking into account that the assessment report usually be printed through the black-and-white printer by the candidates, so the color coordination of the assessment report should be fully clear regard to black-and-white printing situation.

Content of assessment report

(A) the candidate's personal information: Exam Code, name, ID number, test time, test scores;

(B) NCRE brief introduction, the basic required skills of NCRE Level One;

(C) Candidates performance assessment in all six subjects:

(1) Basic knowledge of computer and network infrastructure knowledge. The candidates basic knowledge of computer and network infrastructure knowledge situation;

(2) The ability to input Chinese characters, that is, candidates in the accuracy of Chinese characters input, input speed capability;

(3) WINDOWS operating system, that is, candidates on the Windows XP operating system to master the basic functions of this OS;

(4) Word operation, that is, candidates for the use of Word software.

- (5) Excel operation, that is, candidates for the use of Excel software.
- (6) PowerPoint to operate, that is, candidates for the use of PowerPoint software.
- (7) The ability of using a simple browser and e-mail
- (D) Candidate's the overall performance in the skills

NCRE Level One certificate candidates reported in the overall performance, allowing the candidates to a certain part of the outstanding performance to make up for its deficiencies in other parts. However, in practice, in the overall eligibility criteria on the basis of the various parts of the potential has its own line of a passing mark. Publishing the score line of the potential candidates with the relevant part in the performance comparison, can make clear to the candidates for the development of the skills (their strengths and shortcomings), the goal of efforts is clear for the next step.

Assessment report shows the national average of each part and the corresponding icon of the horizon for reference candidates. At the same time, it also provides students each part score, rank, and icons.

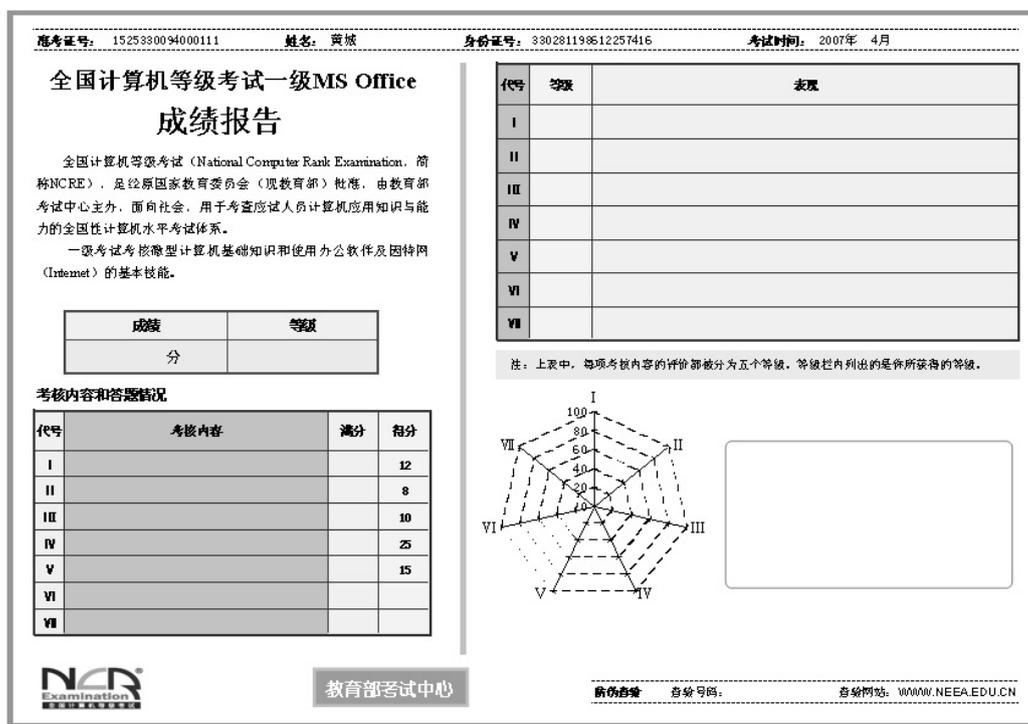


Figure 2 Example of assessment report

Realization of the assessment report

Design the assessment report software

After the completion of the basic design of the assessment report, we have got to consider how to make the report to the reality. This process is equivalent to the laboratory products into real life products. As mentioned in this article before, the number of candidates who taking NCRE Level One test each year is more than 120 million, so providing the fast and stable assessment report for these candidates has become the top priority.

In the process of the Evaluation report software design and development, we are followed the three principles.

(1) The comprehensive needs analysis of software development must be general as far as possible. Analysis of needs must have some important meetings, from different angles and directions to examine whether it is comprehensive, meticulous, whether it is feasible.

(2) Full consideration of software scalability. NCRE test is an opening test system developed, in recent years, every 2-3 years, the subject, an outline has been adjusted, deleting the old subjects and adding new subjects. Assessment report software now is designing for NCRE Level One, but it has to consider the software will be applied to other NCRE levels and subjects. Inside the software we use different module to accomplish different classes or subjects, and make the unity external interface.

(3) Easy-to-use software. In this software development of the result database is the most important work. Now the database used by NCRE can be distributed into three types according to the using moment, in computer skill test we used small-to-use ACCESS database, in the data recovery phase of we used VFP database, in backup and storage phase we used SQL Server database. The assessment report is involved to the ACCESS database and the VFP database, so we have chosen Visual Basic as the software development tools.

The following is the concrete realization of the software. NCRE Level One assessment report software is using the methods of orient object program (OOP) and the modular software. We designed database interface module, data analysis module, data exporting module, print interface module, custom function modules, and individuation papers structure module.

Database interface module, this module is for the realization of the different structure of the database connection. In the preliminary design moment we only considered connection with ACCESS database and VFP database. The latter will increase its SQL Server, Oracle and other database support.

Data analysis module, the function of this module can be splitted into three. The first function is decrypted results of the import database. The second function is splitted the fields of performance and evaluation form for the use of the data structure by using the corresponding table field. And the last one is analyzing the data to forming the assessment data.



Figure 3 Figure Interface of assessment report software

Data export module is used to export the database according to user needs in the field, or to export the database in different formats.

Print function modules, the assessment report will be output through the printer by the employing units or the candidates. Using this function, every one can enjoy the enjoyment of print the report, such as single sheet print, odd / even-numbered print, choose Print, Batch Print, etc..

Custom function modules, according to different levels of examinations and examination subjects to choose different functions.

Individuation papers structure module, different levels or different subject are having the different test structures in the NCRE system, in order to design common software adapt to all structure, we use the module. The software users can define different test structure, and complete the corresponding assessment language.

Because of this, we completed the design of the NCRE Level One assessment report software. In September 2007, we first use this software printing a assessment report for NCRE Level One candidates of Tianjin city and Jiangsu province (the software used is a trial version).