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## Study and application of teaching basic state database in China general universities

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### ABSTRACT

The effective construction of teaching basic state database in colleges and universities has huge influence on the scientific work of university evaluation, and makes positive contribution to the rising social cognition for colleges and universities. In the exploration of this study, firstly, the design objective of the teaching basic state database system has been effectively studied, and the main function of basic status of database construction has also been corresponding explored. Secondly, the system framework and data flow design has been further explored, in which the system framework selection, the system overall structure and the system data procedure have been discussed specifically. After that the design of system database has been conducted overall research, making the construction process of the relevant model more scientific and reasonable. Finally, effectively design process of the system function structure has been carried out to further explore the system's existing function, making the construction of college teaching basic state database more fully and laying a solid foundation on improving its application value. This is the subject train of thought in the process of research and discussion, and meanwhile the institute's main research objectives and corresponding research value are also reflected. The research process of this study can also reflect the scientific nature and rationality of this study, providing strong theoretical support for promoting the social development of colleges and universities.

### KEYWORDS

Teaching basic state in universities; Database; Model building; Applied research.



## INTRODUCTION

From the perspective of development, the construction of teaching basic state database in colleges and universities has provided strong guarantee for the related education management department on the scientific work of university evaluation, and has also supplied timely and effective information feedback for the rapid development of colleges and universities, making the overall development of colleges and universities have a certain scientific basis. In the process of research and discussion, the following aspects such as the system framework and data flow design, database design, system function structure design were mainly studied, allowing the system to get further upgrade.

### THE SYSTEM DESIGN GOAL

In the process of this study, its main purpose is through the establishment of the database enables the department in charge of education in colleges and universities to better supervise and manage the college teaching, improving the college education decision-making ability, at the same time producing some auxiliary functions for the effective work of education. Therefore, making the higher education reform and development more rapidly, at the same time, the meaning of higher education and the quality of education are continuously improved. According to the research objective, in the design process of the system, the establishment of the system goal is as shown below.

#### **To establish the teaching basic state database in colleges and universities.**

The essence of the so-called teaching basic state database is able to storage the teaching condition in colleges and the basic state existing in the process of the education, and main way of the storage and management is to complete in the form of data, providing powerful data support for the education development of colleges and universities<sup>[1]</sup>.

#### **Self-monitoring of colleges and universities**

From the basic form of the development of higher education in China, reflect the basic situation of the development in the form of data, and according to the data, corresponding visualization analysis has been carried out to timely information feedback of the specific deficiencies, realizing self- monitoring role for the development of higher education.

#### **Data collection**

Teaching basic state database in the colleges and universities is the further reflection of a series of problems produced in the development process in colleges and universities as well as the achievements, through the data collection process, the index of the basic data can be better reflected. During which the database provide a more favorable and reliable data platform for colleges and universities. However, for the data collection process, flexible reporting tool are also needed to carry out corresponding table design process by the data needed, providing effective help for the data review and summary.

#### **Decision support**

The main function of decision support is that it can provide strong data support for teaching evaluation work of undergraduate colleges and universities, at the same time, conduct scientific and effective analysis of the particular form of development in colleges and universities. However, the data stored in the database are mostly existed in the multidimensional form, and the application of these data also needs to carry out corresponding analysis process through visualization analysis tools of multidimensional data, so that the data can reflect the basic situation of education in colleges and universities from more angles. Besides the above, the stored data shall be carried out corresponding clustering analysis process, so that the decision function and the auxiliary role of the data itself into full play, providing effective help for educator and management personnel in the colleges and universities.

## SYSTEM FRAMEWORK AND THE DESIGN OF DATA FLOW

### **System framework selection**

#### **The introduction of C/S and B/S structure**

The generation of the C/S mode can be dated back to the formation of network database and the mature of graphics and desktop window development technology in the 1980s, in this period C/S mode is gradually developed and applied. And in this mode, two computers are needed to closely linked, making the formation of the network mode, so the two computers is defined as the server and the client respectively.

In the structure of this mode, all the customer service shall link closely with the database, while the server shall carry out corresponding process to the client data, and the main responsibility of the client lies in the interaction process between clients who use this model structure, thereby effectively and timely information feedback to the backend server<sup>[2]</sup>. However, from the aspects of the request of the client, if the client and the request proposed by the client can be met in a timely manner, then the processing structure can be directly shown, and the opposite may need to relevant data processing through the server for effective information feedback again. And this model can effective and balanced process the things, make its data integrity and consistency for more effective protection, the concrete structure of this mode can be directly reflected by Figure 1.

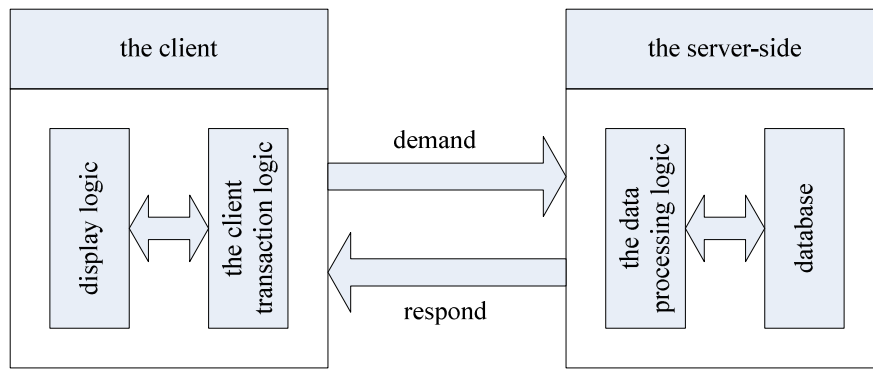


Figure 1 : C/S structure

B/S mode is the effectively process of the traditional C/S mode, during which the database server is effectively upgraded, and it is formed by the browser, database and so on. And from the point of the simple and intuitive, the B/S mode simplifies the client into language browser which tells things only in HTML language.

Through the operational process of this mode, the client instead the corresponding application software through higher applicability browser, and in the operation process the client is done through the browser<sup>[3]</sup>. The main duty of web server's is to accept the request of the client in the first time, and then obtain relevant data in the database server through the corresponding request. Finally through the corresponding data obtained, transform it into HTML language sending to the browser. And the specific structure will be further illustrated by Figure 2.

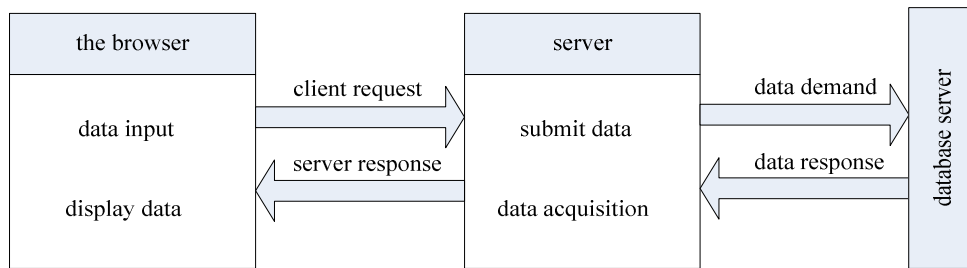


Figure 2 : C/S structure

**Structure comparison between C/S and B/S**

In C/S, though the process of the system for the transaction can be measured and analyzed more scientific, and the integrity and consistency of the data in the database can be effectively guaranteed. However, with the rapid development of network information age, the update and upgrade of the C/S structure mode is the key point, so the cost of system upgrade and maintenance has become one of the problems that must be considered, and in this case the congenital deficiencies existing in the C/S structure mode are fully exposed.

With the accelerating speed of the era development, the rapid development of network information technology has become an indisputable fact, and the advantages and advancement of B/S mode based on web technology have been gradually reflected. However, in the present process of the large database construction, the effective construction of information systems are all adopted B/S mode, which makes software technology achieving the advanced standard<sup>[4]</sup>.

The advantages and disadvantages existing between C/S and B/S structure mode can be further reflected by using TABLE 1.

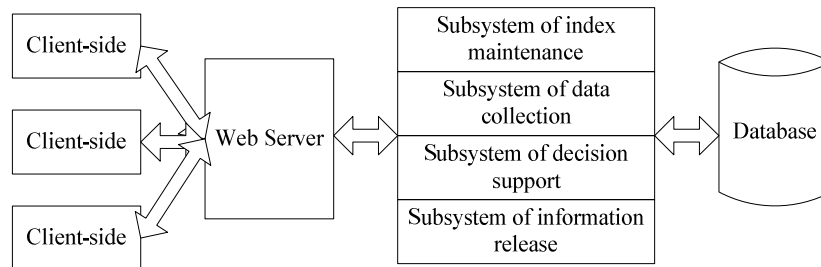
**TABLE 1 : The comparison between C/S mode and B/S mode**

	C/S mode	B/S mode
client-side	a large quantity of tasks	greatly reduce the tasks
the development and maintenance of the system	a large quantity of programming workload	greatly decrease the workload
user operation	complexity	unity, friendly, simplicity
flexibility	poor flexibility	good flexibility
portability	difficulty of transplant	no portability problems
expansibility	convenient to extension	excellent expansibility
timeliness and interactivity	good	general

The comparison process of the above two kinds of structure mode shows that the advantage of B/S structure mode existing in the process of development and maintenance is relatively large, and meanwhile it has the higher flexibility and ease of operation, and the transplant function of data is upgraded more effectively. Those are all the advantages of the B/S structure mode, so in the research and discussion of this paper B/S mode development is adopted.

**The overall structure of the system**

In the process of this system construction, B/S structure mode is selected for the system architecture, the specific overall structure of the system is reflected by Figure 3.

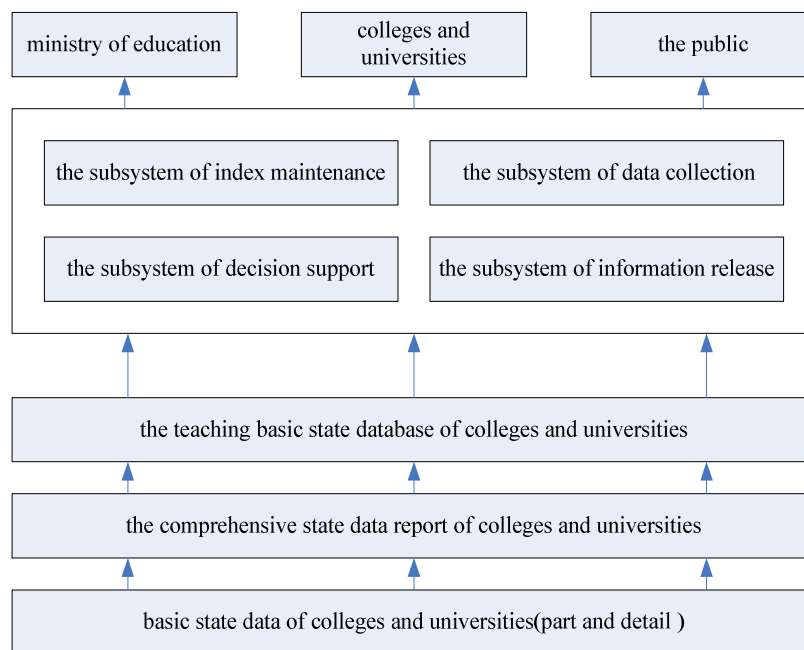


**Figure 3 : The overall structure of the system**

In the process of this system construction, four modules have been focus on. The first module forming this system refers to the subsystem of index maintenance, the second is the subsystem of data collection, and the third is the subsystem of decision support, and the last is the subsystem of information release.

**The system data flow**

The data in the system is mainly divided into three levels, the first level is the basic state data of the colleges and universities, the second data is the comprehensive state data of colleges and universities, the third layer is the teaching basic data of colleges and universities, however, for the process of data collection, an orderly collection is carried out according to levels, the order is from low to high. The so-called basic state data of the colleges and universities can reflect all aspects of the details such as the teaching, scientific research and management of the colleges and universities in the form of data. And the comprehensive state data is the effective summary for the basic state data, and create the overall data reflecting the overall development and the specific situation of colleges and universities<sup>[5]</sup>. And the generation of the teaching basic data and comprehensive state data has some similarities. The formation of the teaching basic data is effective summary based on the comprehensive state data as the main body, making the generation of the data on various aspects of colleges and universities teaching ability, and the teaching state can be more intuitive reflected, meanwhile the teaching basic data have provided effective data support for each function module. And in the process of the system construction the data flow diagram can be specifically reflected by Figure 4.



**Figure 4 : The system data flow**

## DESIGN OF SYSTEM DATABASE

### Concept data modeling

The database is crucial for the whole system, and it can provide powerful data support for the whole system, and has also play an important role in the process of data analysis, data mining and the horizontal and vertical alignment data comparison. In the process of the database construction, the traditional database building type can't be adopted, and the warehouse database shall be efficiently established.

However, in the evaluation process of the whole school, several aspects are mainly involved. According to the practical evaluation index system of the competent department of education, the database establishment shall determine the corresponding subject field. The subject fields are as follows: the conditions of running a school theme, teaching staff theme, the teaching level of the teachers theme, student information theme, talent cultivation theme, campus culture theme and teaching management theme. However, after the determination of the above and the subject field, the system mode shall be further designed and its E-R mode shall be effectively established, for the purpose of conducting the process of analysis on subjects involved in each theme. During which the conditions of running a school theme is taken as an example, the elements of this theme is composed of fact table and multidimensional data table. And the fact table contains the corresponding data of the specific evaluation index. As for the analysis process of data, table data is adopted to carry out the corresponding data analysis, making its data as an entity. For the entities existing in each topic, the following several aspects can be used to express.

Firstly, it is evaluation data entity and it consists of index number, index value, data date and so on, as shown in Figure 5.

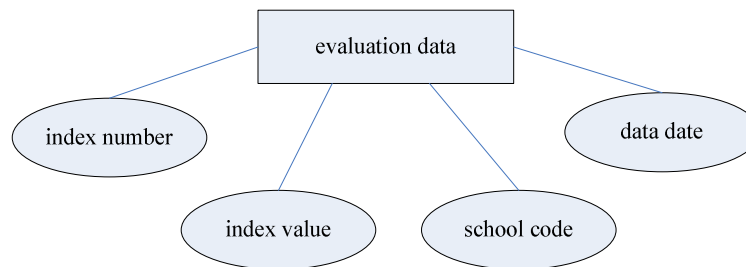


Figure 5 : Assessment data entity

Secondly, it is index entity, and it shows the specific data index that can directly to obtain in the process of data reporting of the colleges and universities. And these indexes are mainly on index number, the name of index and the unit and so on. As shown in Figure 5.

### Physical model design

The work that needs to do in the phase of physical model design is how to realize the model generated by the logical modeling, such as determine storage structure of the data, the index strategy, location, storage distribution, etc. The main factors influencing the physical modeling include: FO access efficiency, space efficiency and maintenance cost.

## SYSTEM FUNCTION STRUCTURE DESIGN

The function of the system includes four parts: the subsystem of index maintenance, the subsystem of data collection, the subsystem of decision support and the subsystem of information publishing. See the system function structure in Figure 6.

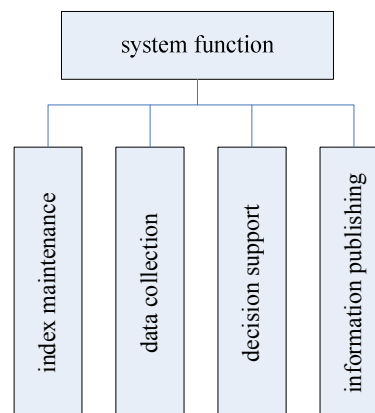


Figure 6 : System function structure

### **The subsystem of index maintenance**

For the whole process of index maintenance, the index maintenance which contains not only the process of a basic evaluation index maintenance, but also includes the process of comprehensive index maintenance. For the process of basic index maintenance, it refers to the process of addition and modification, or deletion of the index. However, in the specific process of teaching evaluation, there are certain inclusive and hierarchical relations existing in evaluation system and the indexes, therefore the two kinds of relations must be maintained in the process of the various operations. And teaching evaluation process is an evaluation process full of some dynamics, therefore in the maintenance of evaluation subsystem, the comprehensive evaluation index shall be effectively maintained.

### **The subsystem of data collection**

In the process of corresponding data collection, the main data collections include the process of basic information data collection and teaching evaluation index data collection. As for the former, it can be carried out corresponding modification after the colleges and universities filling out and submitting the form. The data collection mainly aims at the evaluation data collection of the colleges and universities, and the related education management department can make the corresponding form to carry out the process of corresponding assessment data reporting, and this form will be distributed respectively to different universities for data filling<sup>[7]</sup>. The corresponding data backup is carried out after data filling. At the same time, each data reported by the colleges and universities can be sorted and summarized through the system, and finally reported to the relevant administrative departments directly.

### **The subsystem of decision support**

In the process of colleges and universities teaching state evaluation, the evaluation index usually have certain multi dimensions. Therefore in the process of analyzing data, the data view can be used to conduct the corresponding data analysis process. Meanwhile the intuitive visual analysis tools are combined with for its data analysis, showing the data in the process of historical teaching of colleges and universities in the form of a graph or bar chart clearly. In that case the changes in data can be more intuitive summary, and even forecast the developing direction of the data effectively.

However, the function of the visual data itself lies in that it has provided effective decision support function for the work of teaching evaluation. And this role is limited to the auxiliary level. Through the corresponding data mining process, the basic state information of colleges and universities is fully mined and extracted, and the result data manifested intuitively by visual means. The complex data is able to express in a simple graphics and shape, so the data reveals certain spatiality and it is relatively easier for visual accept.

### **The subsystem of information release**

The general process of information release is that a certain number of information released after reasonable collection and finishing process, all information is embodied on the website of the whole system in order to improve social awareness of colleges and universities, and it also can provide powerful information feedback for evaluation, making the late development of colleges and universities integrate with the development of times closely and guaranteeing the effect of evaluation work in the colleges and universities and the social awareness of the colleges and universities development.

## **CONCLUSION**

The above is the specific process of the application and relevant studies of teaching basic state database in colleges and universities. The following three aspects such as system framework and the design of data flow, the design of system database, the design of system function structure are focused on, in order to provide solid foundation for the construction of teaching basic state database in colleges and universities and also supply corresponding theory and practical support for the further research work afterwards.

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