Research on the application of data mining technology in the teaching quality evaluation in Colleges

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Abstract. To improve the teaching quality and the quality of talents training is the basic goal of the reform of higher education and teaching.Scientific evaluation and monitoring is an important means to achieve this goal.The application of data mining technology in the teaching quality evaluation system has become the focus of the research on teaching quality evaluation in Colleges.Firstly, this paper analyzes the advantages of data mining technology in teaching quality evaluation. The concept and concrete steps of data mining are studied. Finally, the data extraction process and the composition of the data mining module in the teaching quality evaluation data mining are analyzed.

1.Introduction

In this paper, the data mining technology is applied to the teaching quality evaluation in colleges.By mining a large number of potential knowledge hidden behind the assessment data and analysing teachers' classroom teaching situation and students' daily learning situation, scientific and reasonable data for management decision is provided.This would promote the development of teaching in Colleges. The application of data mining technology can objectively reflect the shortcomings of the teaching management in colleges.

2. Overview of data mining techniques

2.1 The concept of data mining

Data mining is the process of extracting information and knowledge which is implicit and people do not know in advance, and has potential application value. Data mining contains three meanings. Data sources must be rich and realistic. Mining knowledge must be valuable. It is cccording to the specific requirements of the people to find the problems and information. From the definition of data mining, data mining and knowledge discovery in database are very similar. It is because data mining has inherited the achievements of knowledge discovery field from theory and technology.

2.2 Data mining steps

Usually the general process of data mining includes the following steps:

First, the definition of the problem. To make a clear definition of business issues, to determine the target of the mining.

Second, data preparation. Mainly includes data selection and data pretreatment.Data selection is to extract the target data set in the database and data warehouse target. And data preprocessing is the re processing of data,it is mainly to check the integrity and consistency of the data. Including noise removal, delete invalid data, etc

Third, data mining.To select the applicable calculation method according to the type of data function and characteristic of data set.

Fourth, result analysis. It includes explaining the results of the mining and converting it to the knowledge that the user can understand.

Fifth, application of knowledge. To integrate the mining knowledge into the business information system and make knowledge play a role

3 Application of data mining technology

3.1 Data preparation

Data preparation is the basis of data mining. Because the data that mining task needed often come from different databases, the data is huge, the data structure is complex. At the same time, there may be a lot of duplication of data, ambiguous data, noise data. Therefore, the function of data preparation is very important in the process of data mining.
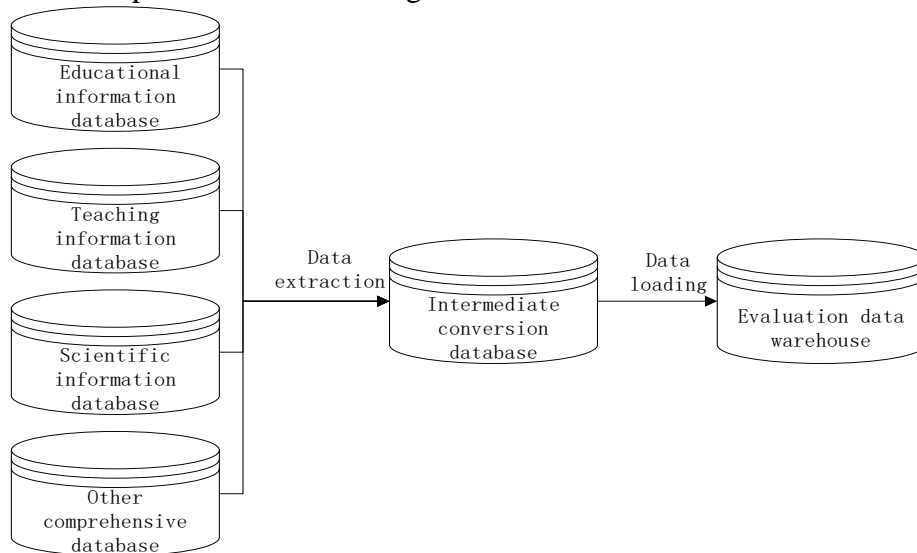

Fig. 1 Schematic diagram of data extraction and transformation process

In the phase of data preparation, firstly, to determine the goal of mining. Data mining personnel must communicate with the domain experts and end users to understand the tasks of data mining and make the mining plan. Secondly, it is necessary to determine the data source, and then extract the relevant data from the corresponding database. At last, the data is integrated, and the data extracted from multiple data sources are stored in a unified data warehouse.

3.2 division of data mining modules

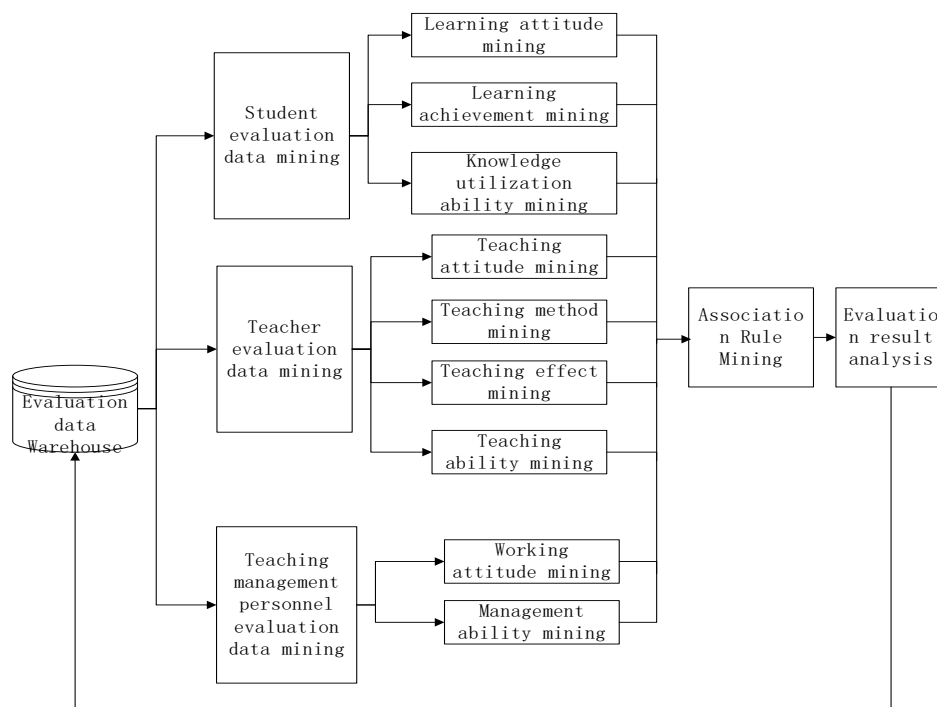The function module of teaching evaluation data mining system is shown in figure 2:

Fig. 2 Teaching quality evaluation data mining module function diagram

The main work of student data mining module is mining and evaluation of students' learning attitude, learning achievement and comprehensive quality data during the course of learning.

Teachers' data mining module is mainly to analyze and deal with the teaching content, attitude and effect in the teaching process. At the same time, teachers can receive the evaluation of other teachers and students. They can learn some lessons and experiences and improve their deficiencies in teaching work. So as to develop a more appropriate teaching program.

Teaching management personnel data mining module main mines management personnel working attitude and management ability. At the same time,it can receive teachers' and students' feedback on teaching management in order to better plan for the future of teaching management.

4. Architecture design of teaching quality evaluation system

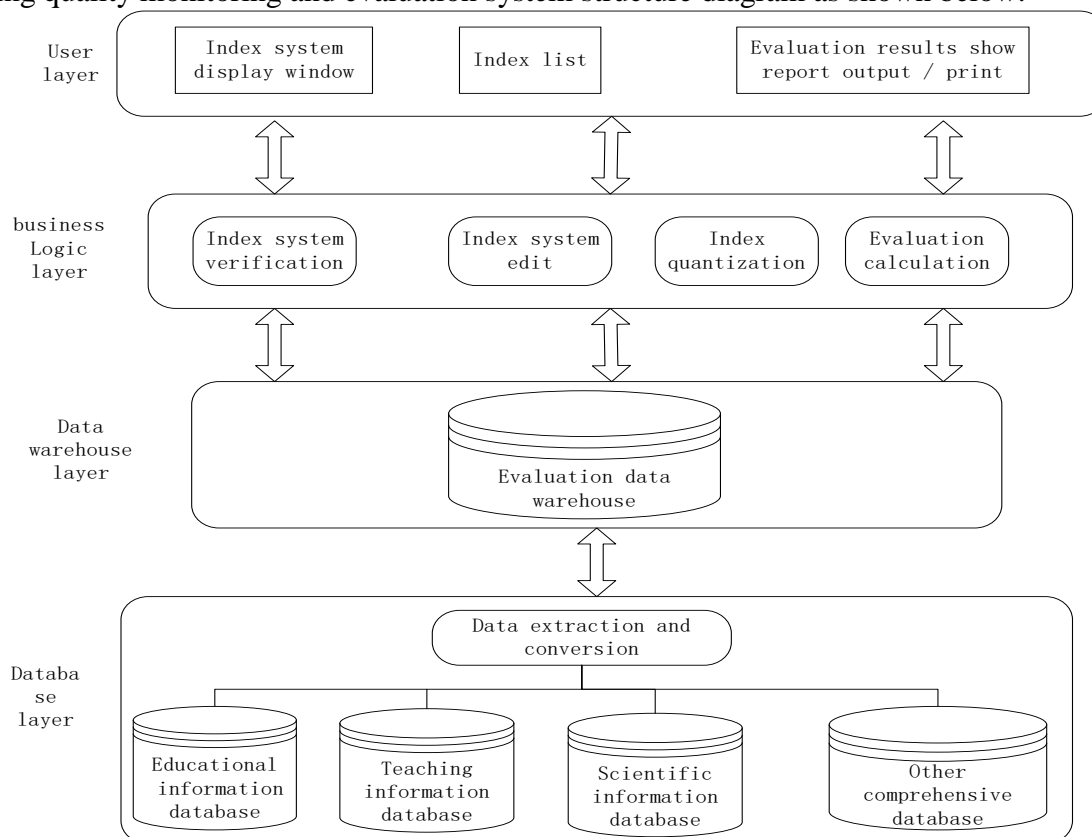Teaching quality monitoring and evaluation system structure diagram as shown below:

Fig. 3 Teaching quality monitoring and evaluation system architecture diagram

The user layer mainly provides a visual graphical editing environment, which makes it easy for the assessment staff to carry out assessment work.

The business logic layer mainly realizes the interface between each function module in the system.It receives commands from the human-computer interaction layer and processes it. At the same time it calls the integrated calculation module for the corresponding processing.

The data warehouse layer and database layer mainly realize evaluation data management, data collection, educational administration information data storage, research information data storage and other comprehensive information data storage management.

5. Summary

In this paper, the application of data mining technology in the teaching quality evaluation is analyzed, the process of data extraction and transformation in teaching information data mining is studied and the function module of data mining is analyzed. With the continuous advancement of higher education informatization and the continuous improvement of all kinds of teaching management information systems, the application of data mining technology in the teaching quality evaluation of higher education will be more extensive.

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