



Distance Teaching Method of Accounting Informatization Course Based on Big Data Mining

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Abstract. In order to maximize the practical teaching application value of accounting informatization course, a distance teaching method of accounting informatization course based on big data mining is proposed. This paper analyzes the practical value of big data mining technology in accounting information teaching from three angles of students' learning autonomy, knowledge digestibility and teaching quality. On this basis, the B/S architecture is established, and with the help of .NET dynamic development technology, the identity of the accessed teaching objects is authenticated, so as to realize the smooth application of the distance teaching method of accounting informatization course based on big data mining. The comparative experiment results show that compared with the traditional teaching system, after applying the above-mentioned distance teaching method, students can better accept the course of accounting informatization, understand and comprehend its basic knowledge, and give full play to the teaching application value of this practical course.

Keywords: Big data mining · Accounting informatization · Distance education · Enthusiasm for learning · Digestibility · Teaching quality · B/S architecture · Object identity

1 Introduction

Large data mining is a process of searching hidden information from a large amount of data by algorithms. Big data mining is usually related to computer science, and achieves this goal through statistics, online analysis and processing, information retrieval, machine learning, expert systems (relying on past rules of thumb), and pattern recognition. Large data mining is a hot topic in the field of artificial intelligence and database research. Data mining is a nontrivial process that uncovers hidden, previously unknown and potentially valuable information from a large amount of data in a database [1]. Data mining is a decision support process, which is mainly based on artificial intelligence, machine learning, pattern recognition, statistics, database, visualization technology, etc., to analyze the data of enterprises automatically, to make inductive reasoning, to mine out potential patterns, to help decision-makers adjust their market strategies, to reduce risks and to make correct decisions. The process of knowledge discovery consists of the following three

stages: (1) data preparation; (2) data mining; (3) result expression and interpretation. Data mining can interact with users or knowledge bases.

Accounting informationization is the combination of accounting and information technology. It is a new requirement for financial information management in the information society, and a necessary measure for enterprise accounting to comply with the tide of informationization. It is the main channel for enterprise leaders to obtain information under the network environment, which helps to enhance the competitiveness of enterprises, solve the “island” phenomenon of accounting computerization, and improve the decision-making ability of accounting management and the level of enterprise management. Looking at the development of accounting informationization in China over the past 20 years, although the function of information system has been enhanced and its application has become more and more popular, especially the large and medium-sized enterprises have realized accounting informationization to some extent and applied accounting software, but on the whole, China’s accounting informationization is still in the process of development and there are many problems to be solved urgently. Information technology, through the network system, make business processing highly automated, information sharing, can actively and real-time reporting of accounting information. It is not only a change of information technology applied to accounting, but also a new accounting thought adapted to the environment of modern information technology. [2]. This point of view is also a deductive reasoning logic conclusion, that the goal of accounting information is to establish a modern accounting information system, will lead to a new accounting thinking. At the same time, it is pointed out that accounting informationization should restructure the traditional accounting mode, and that the characteristics of accounting informationization are highly automatic, fully open, highly shared and real-time reporting.

2 The Value of Big Data Mining in Accounting Informatization Teaching

Firstly, it analyzes the value of big data mining in accounting informatization teaching, cultivates students’ learning enthusiasm and autonomy, constructs the B/S architecture of accounting informatization course, uses net dynamic development technology to verify the identity of the object, uses accounting virtual reality teaching mode, and with the support of big data mining technology, It realizes the smooth application of distance teaching method of accounting information course.

2.1 Mobilize Students’ Enthusiasm and Autonomy in Learning

With the rapid development of information technology, words, pictures, sounds, videos, animations and so on can be perfectly presented with the help of information technology, and are fused into a whole, bringing strong stimulation to users in terms of vision and hearing. In the process of accounting teaching, the information technology can show the abstract and boring words in books in a vivid, vivid and novel way, bring strong stimulation to students’ senses, can arouse students’ enthusiasm and motivation for learning, and the efficiency and effect of classroom learning have been improved

obviously. Compared with traditional oral lectures by teachers, the use of multimedia technology enriches the learning experience of students, not only audibly and visually satisfies them, but also conveys the learning content in a more diversified form to students, with learning efficiency and learning quality exceeding expectations [3]. In addition, the majority of teachers and students can log on to relevant learning websites, campus libraries and other learning centers through the Internet, using the above rich learning resources, self-learning. Students in the network learning, have more freedom and autonomy, according to their own learning ability and learning level, choose their own learning materials, in view of their own learning deficiencies to carry out purposeful leak detection and compensation learning. Such personalized learning, not only suitable for each student's actual learning situation, students' learning absorption rate is higher, but also the students' learning efficiency and learning effect is unexpected.

2.2 Improve Students' Knowledge Digestibility and Absorption Rate

Informationized teaching is to use modern information technology to present the abstract and difficult knowledge in various forms. Students can carry out personalized learning according to their actual learning conditions and needs, and can deepen the understanding and grasp of knowledge in repeated learning to meet the diversified learning needs. For example, in the "Basic Accounting" teaching content, including the "accounting procedures" and "accounting methods" two important knowledge learning content. Using the traditional teaching method, the teacher can only explain and impart the relevant content of the textbook by oral teaching, which is not only boring, but also difficult for the students to understand and use flexibly. In the modern information teaching environment, multimedia technology will play a role, boring and difficult to understand the abstract knowledge, in the form of pictures, animation, small video presented to students, so that the original more complex knowledge points, can be explained to students in a vivid form, not only to help students understand the knowledge, but also deepen the memory of students, students' learning ability and learning efficiency have been greatly improved.

2.3 Improving the Teaching Quality of Accounting Informatization Course

Using Internet technology, teachers can surf the Internet to find some high-quality teaching resources, advanced learning methods, and teach students to apply in practical teaching, and strive to improve the quality of teaching. Teachers can go to the Internet to find high-quality teaching courseware, students can go to the Internet to search for relevant learning materials to make up for their lack of learning. In addition, the use of multimedia technology saves a lot of time on the blackboard, increases the teaching time and teacher-student interaction time, greatly improve the classroom teaching efficiency.

Generally speaking, in the school official network construction, the hardware construction is less difficult, as long as a reasonable design and planning, organization, use some construction funds, you can normal operation. In the construction of the school education platform, the hardware construction is the key point, and the information points of the website cover the whole campus, which needs to be equipped with proxy server,

optical disk mirror and DNS, etc., and also includes some office equipment such as computers and printers [5]. Make sure that every computer in the school can be connected to the educational platform to prepare for distance learning.

In order to achieve the goal of multi-media teaching, it is necessary to construct the teaching information resources of accounting education website and develop related teaching software. Teachers' teaching material base mainly involves electronic teaching plan base, multimedia teaching courseware base, teaching video, etc. The emphasis of building teachers' teaching material base is multimedia teaching courseware. The making of multimedia courseware needs the support of multimedia software. Teachers can use multimedia software to make the accounting content into teaching courseware that combines text, image, sound, video and other resources. The design and making of multimedia teaching courseware needs many steps: First, the overall design of multimedia teaching courseware. Teachers should strengthen the analysis and summary of accounting curriculum and teaching characteristics, and reasonably choose multimedia software and courseware development. In the development of multimedia teaching courseware, it is necessary to reasonably plan teaching strategies and teaching schemes to lay a foundation for making multimedia teaching courseware. Second, the multimedia courseware content planning [6]. According to the characteristics of accounting curriculum content planning multimedia courseware content, clear multimedia courseware structure and courseware arrangement. Teachers can reasonably plan the multimedia courseware content according to the teaching objectives, teaching requirements, the degree of knowledge difficulty and teaching methods. Third, the preparation of multimedia courseware script. The quality of multimedia teaching courseware script will directly affect the effect of multimedia teaching courseware. Therefore, teachers should make sure that the courseware script involves concrete teaching content, arranges the multimedia teaching courseware reasonably according to time and teaching order. Teachers and software staff should discuss how to write the multimedia courseware script.

3 Distance Teaching Method of Accounting Informatization Course

3.1 B/S Architecture

The most basic hierarchical model is a three-tier model, including presentation layer, logic layer and data layer. The presentation layer is a message channel, the logic layer should provide a real image, and the data layer provides the measurement of the real system. The logic model of the application system also reflects such characteristics, which includes a large level of display, data and application logic. Generally speaking, the layers of typical information systems are data layer, data maintenance layer, data semantic layer, link communication layer, application logic layer, presentation logic layer and presentation layer from bottom to top [7]. This is a complete hierarchical structure, and calls are generally not made between layers. This system reflects the flexibility and stability of the hierarchical model. The architecture of the hierarchical model is shown in Fig. 1.

There is no doubt that all the necessary data and all the forms of distance learning are stored here. The data layer mainly uses the database to save and manage the data. Relational database is suitable for storing structured data; XML file is a hierarchical

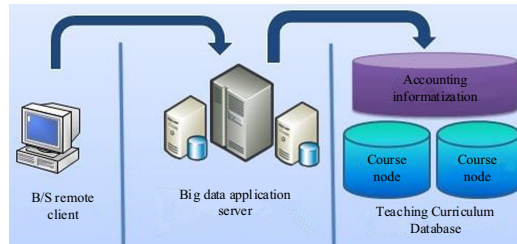


Fig. 1. B/S Architecture of accounting informatization course

model of self-describing information; directory service is a kind of distributed storage and management of information, which can provide higher query efficiency; file system is an operating system level data storage; registry is mainly used for software running on Windows system, which provides special API access, or it can be regarded as a directory service storage environment. In a word, the main problems of data storage layer are where the data is stored, how to access it, operation efficiency, operation security, data encryption and so on.

The data maintenance layer is based on the data layer. Its main function is to ensure the correct access to data and maintain the correct state of data. A more common implementation is the use of database stored procedures and triggers. For an object database system that holds persistent objects, the object properties process can do a similar job. The semantic layer is a very important layer of information systems [8]. At this level, the changes are numerous, constantly changing parts of the state; it is also a working information system, constantly reflecting changes in the real system. Here the communication layer is responsible for providing communication services, that is, interfaces between information systems and other systems. Because complex systems often support distributed computing systems, it is necessary to encapsulate the functions of communication for information transfer and synchronization control between systems. At the same time, this layer can be separated to facilitate the control and deployment of the whole distributed system. In this layer can be added to the system monitoring, load balancing and other functions. At the same time, a distributed message and event mechanism is often deployed in this layer, so that the transparent access to the functional modules can be achieved for the upper modules.

The Application Logic layer is where the really active system functional modules work. Here, the operating logic of true preservation is the primary focus of the system analysis. At this level, each module is in a different state, collaborating by calling each other, or by messages. The so-called presentation logic is mainly to manage the completion of the information presentation agreement. For example, what kind of information a user can see in what state. The presentation logic layer holds the various constants defined in the presentation interface, such as window size and style. In addition, this layer also includes customization and modification of the presentation interface. The presentation layer is mainly responsible for dealing with users, displaying system information, and accepting orders from users. This is the part of interacting with the user and the part of the information system that changes frequently. Specialized presentation layers are primarily used to present and interact with the look and feel of the components.

3.2 NET Dynamic Development Technology

ASP.NET is a unified Web development model that includes a variety of services necessary to generate enterprise-class Web applications. ASP.NET is provided as part of the .NET Framework. Code for ASP.NET applications can access classes in the .NET Framework, code for applications written in Microsoft Visual Basic, C#, JScript, .NET, and J# languages that are compatible with the common language runtime, and develop ASP.NET applications that take advantage of the common language runtime, type safety, inheritance, and more.

ASP.NET includes: Pages and Control Framework, ASP.NET Compiler, Security Infrastructure, State Management Capabilities, Application Configuration, Health Monitoring and Performance Capabilities, Debugging Support, XML Web Services Framework, Extensible Hosting Environment and Application Lifecycle Management, Extensible Designer Environments, and more. ASP.NET instructional web pages are completely object oriented. In ASP.NET Web pages, you can use properties, methods, and events to handle HTML elements. The ASP.NET Page Framework provides a unified model for responding to client-side events in code running on the server, eliminating the need to consider the implementation details of client and server isolation inherent in Web-based applications. The framework also automatically maintains the state of the page and the controls on that page during the page processing life cycle.

Using ASP.NET pages and control frameworks, you can also encapsulate commonly used UI functions into easy-to-use and reusable controls. Control can be written once for many pages and integrated into an ASP.NET Web page. These controls are placed in ASP.NET Web pages during rendering.

ASP.NET pages and control frameworks also provide features that allow you to control the overall look and feel of your Web site through themes and skins. You can define themes and skins first, and then apply them at the page or control level. In addition to themes, you can define master pages so that the pages in your application have a consistent layout. An Master Page defines the layout and standard behavior that you want for all pages (or groups of pages) in your application. You can then create individual content pages that contain the page specific content to display. When a user requests a content page, these content pages are merged with the master page to produce output that combines the layout of the master page with the content in the content page (Fig. 2).

Students' online learning database mainly involves online electronic textbooks and learning reference materials. Students' online learning database can provide students with learning materials other than teaching materials, which is of great significance to improve students' learning effect. With the gradual deepening of China's accounting reform, the original accounting teaching materials can no longer meet the requirements of accounting personnel training, so it is necessary to publish the relevant information and achievements of accounting reform in a timely manner on the accounting teaching website. Students' electronic homework system mainly involves interactive homework support system, homework question bank and homework e-mail. Students can search for learning materials according to their own learning situation and learning needs, which is beneficial to improving students' learning effect. The student electronic operation system has the following functions: First, automatically generate test questions [9]. Students' electronic homework system can automatically form and match test questions according

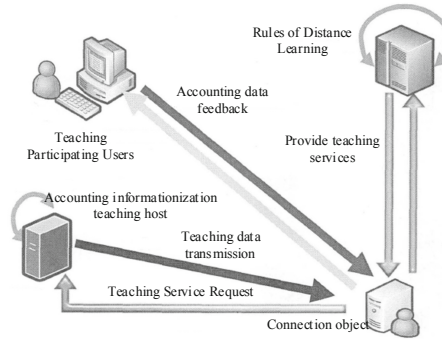


Fig. 2. NET dynamic development technology application flow chart

to teachers' setting requirements, teaching materials and teachers' requirements for homework difficulty. Students can automatically extract test questions from the question bank and automatically form test papers. Second, electronic testing. Students can use the student electronic operation system to answer test questions. Students' electronic operation system can automatically roll up according to the test time set by teachers. When the test time set by the teacher is reached, students are not allowed to continue answering questions. In the whole test process, if students encounter problems, the students' electronic operation system can help them. Third, automatic marking. After the students' electronic operation system is automatically rolled up, it can automatically compare the standard answers with the students' answers and score them automatically. For some subjective topics, teachers can review and give feedback by mail, and for topics with high student error rate, teachers can communicate with students through communication platform.

With the gradual development of science and technology and the popularization of computerized accounting, accountants need to use accounting software to complete bookkeeping, accounting and reimbursement, and use accounting software to do a good job of analyzing the whole financial process. Accounting information system has become a system that accounting students must skillfully use. In order to improve the practical ability of accounting majors, it is necessary to actively build accounting experimental software system and experimental case database. At present, China has developed and popularized a variety of commercialized accounting software, such as UFIDA financial and enterprise management software M8.x, UFIDA U8 series, etc. By combining commercialized accounting software with accounting education websites, students can download and install commercialized accounting software according to their own needs, and simulate corresponding accounting cases according to the experimental cases provided by the experimental case database of accounting education websites. Students independently complete accounting analysis, preparation of accounting statements, financial treatment, salary calculation, fixed assets accounting, etc. After the experiment is completed, the experimental account data formed by students in the whole experiment will be collected by the experimental operation database and evaluated by teachers. Students can use the accounting experiment software system to review related knowledge in their spare time, which can not only improve students' understanding of the basic principles

of accounting, accounting process and accounting affairs management knowledge, but also improve students' cognition of accounting methods and accounting data processing, and improve the professional ability of accounting majors, thus laying a solid foundation for future development.

3.3 Object Authentication

With the support of big data mining technology, the distance teaching mode of accounting informatization course is mainly for teachers to present the teaching content to students through the big screen through the accounting education platform, so as to achieve the teaching purpose. Accounting demonstration teaching includes static demonstration and dynamic demonstration. Static demonstration is easy to understand, that is, putting the teaching content on the big screen. Dynamic demonstration is to show the key and difficult teaching contents to students in a dynamic form with the help of computer technology, which is more vivid and concrete. Dynamic and static demonstration methods can improve the teaching effect of accounting demonstration, and teachers should choose demonstration methods reasonably according to the teaching situation.

This teaching mode is mainly in the information technology environment. The school is equipped with a complete teaching system, through which students ask their own questions in time, and teachers answer questions for students in time on the computer. This communication mode between teachers and students breaks through the limitation of time and space, which is beneficial to improve learning efficiency and learning effect. Accounting virtual reality teaching mode refers to a kind of teaching mode which uses computer software to simulate the practical problems in accounting work and solve these problems [10, 11]. Under the indoctrination teaching mode, due to the high complexity of some accounting problems and less teaching hours, accounting students can't fully understand these knowledge and solve accounting problems with knowledge in a short time. In classroom teaching, teachers mostly explain the basic knowledge and principles of accounting to students, but they do not explain how to use accounting knowledge to solve practical problems.

Using accounting virtual reality teaching mode [12, 13], students can download accounting related data and information in accounting teaching website, and complete accounting experiments according to their own knowledge. In addition, students can also use role-playing to give full play to their subjective initiative, so as to ensure that students can correctly recognize the differences between classroom teaching and accounting work while participating in the actual accounting work, thus achieving the purpose of improving students' analytical ability and problem-solving ability. This teaching mode mainly uses the Internet and local area network to realize the long-distance transmission of courses and achieve the goal of cross-regional teaching. Because the accounting distance teaching mode has the characteristics of two-way, real-time and interactivity, and the accounting professional teaching knowledge system is relatively stable and complete, the distance teaching mode is suitable for accounting professional teaching. Let D_{\max} represent Maximum interference authority of big data mining technology, ξ_{\max} represent the maximum teaching application value of accounting informatization course, and ξ_{\min} represent the minimum teaching application value of accounting informatization course.

Combining the above physical quantities, the object identity authentication conditions of the course distance teaching method can be defined as:

$$L = \frac{D_{\max}}{2} \sqrt{\frac{f(\xi_{\max} - \xi_{\min})^2}{n \times (e_n^2 - e_1^2)}} \quad (1)$$

In the above formula, e_1 represents the object identity mining processing authority at the first teaching node, e_n represents the object identity mining processing authority at the n teaching node, and f represents the general application coefficient of accounting informatization course. At this point, the calculation and processing of various physical coefficient indexes have been completed, and with the support of big data mining technology, the smooth application of the distance teaching method of accounting informatization course has been realized.

4 Analysis of Experimental Results

To verify the practical application value of the distance teaching method of accounting informatization course based on big data mining, the following comparative experiments are designed. In the course implementation environment shown in Fig. 3, the same number of students are selected as the research objects of the experimental group and the control group respectively, in which the hosts used by the experimental group are equipped with the distance teaching method of accounting informatization course based on big data mining, while the hosts used by the control group are equipped with the traditional distance teaching system, and the specific changes of each experimental index are recorded under the same experimental environment.



Fig. 3. Application environment of distance education course implementation

TTR index can reflect students' actual acceptance of accounting informatization course. The purpose is to construct the function of technical analysis and other technical transaction rules in R. Its function is moving average Trend detection and intensity Shock indicators Volatility indicators and Volume analysis, the advantages are (1) flexible;

Support multiple temporal data formats; The index calculation methods are various (2) The calculation speed is relatively fast (3) It can process high frequency data. In general, the greater the TTR index, the higher the students' acceptance of accounting informatization course, and vice versa. The following table records the actual changes of TTR index values of experimental group and control group.

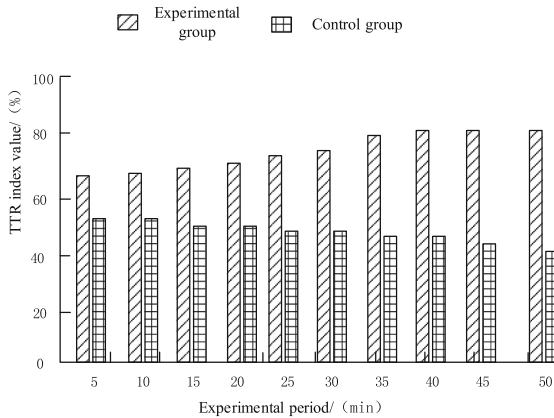


Fig. 4. TTR index numerical comparison figure

According to the analysis of Fig. 4, with the extension of the experimental time, the TTR index in the experimental group keeps the numerical change trend of first rising and then stabilizing, and the maximum numerical result in the whole experimental process reaches 81.6%, which is 6.8% higher than the initial numerical value of 74.8%. The TTR index in the control group began to show a continuous decline after a step-by-step downward trend. The maximum value in the whole experimental process only reached 55.1%, which was 26.5% lower than the maximum value in the experimental group. To sum up, with the application of the distance teaching method of accounting informatization course based on big data mining, the TTR index value has obviously increased, which can promote students' learning and acceptance level of accounting informatization course from the practical point of view.

STR index represents students' ability to understand and comprehend the basic knowledge of accounting informatization course. In general, the greater the STR index, the stronger the students' ability to understand and comprehend the basic knowledge of accounting informatization course, and the weaker the opposite. The following table records the specific changes of STR index values in experimental group and control group.

According to the analysis of Fig. 5, with the extension of the experimental time, the STR index in the experimental group began to decline gradually after a stable state for a period of time, and finally began to rise continuously, and the maximum numerical result in the whole experimental process reached 80.4%. In the control group, the STR index keeps a decreasing trend, but the decreasing range in the later stage of the experiment is obviously higher than that in the early stage of the experiment. The maximum value

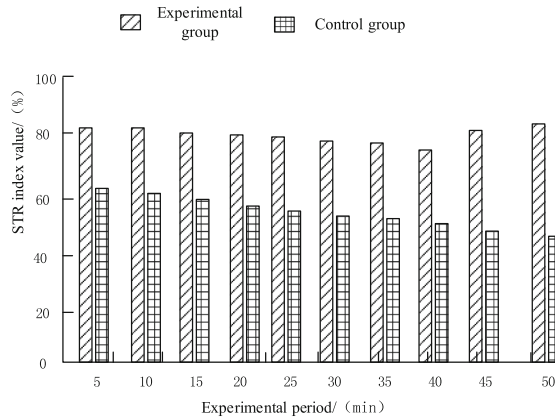


Fig. 5. Comparison figure of STR index values

in the whole experiment process can only reach 63.2%, which is 17.2% lower than the maximum value in the experimental group. To sum up, with the application of the distance teaching method of accounting informatization course based on big data mining, STR index also shows an obvious upward trend of numerical change, which can greatly enhance students' practical understanding and comprehension ability of the basic knowledge of accounting informatization course. This is because the role of net dynamic development technology in B/S architecture can mobilize students' learning enthusiasm and autonomy.

5 Conclusion

Compared with the traditional distance teaching system, the distance teaching method of accounting informatization course based on big data mining combined with. This paper establishes the B/S architecture of distance teaching method, uses net dynamic development technology to authenticate the identity of the visited teaching objects, and presents the teaching content to students with the support of big data mining technology. NET dynamic development technology under the action of B/S architecture can not only improve the actual teaching quality of accounting informatization course, but also fully mobilize students' learning enthusiasm and autonomy. From the practical point of view, the improvement of TTR index and STR index can greatly enhance students' practical understanding and comprehension ability of the basic knowledge of accounting informatization course, and meet the application demand of maximizing the practical teaching application value of accounting informatization course.

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