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Retraction

Retracted: Intelligent Construction and Mechanism of Educational Big Data Information for Resource Sharing

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] Y. He, L. Yi, and S. Xu, "Intelligent Construction and Mechanism of Educational Big Data Information for Resource Sharing," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 6002181, 12 pages, 2022.

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Research Article

Intelligent Construction and Mechanism of Educational Big Data Information for Resource Sharing

Yuan He,[1] **Liqiong Yi**,[2] **and Si Xu**[3]

[1]*College of Education, Huanggang Normal University, Huanggang, 438000 Hubei, China*
[2]*CHINA-ASEAN International College, Dhurakij Pundit University, Bangkok 10210, Thailand*
[3]*School of Network and Information Security, Jiangsu College Of Safety Technology, Xuzhou, 221000 Jiangsu, China*

Correspondence should be addressed to Yuan He; knight86@hgnu.edu.cn

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The word "sharing" is not unfamiliar to everyone now, but many people do not understand the sharing of educational resources (ER), and the distribution of ER does not seem to be the topic that people are most concerned about. This paper is aimed at conducting research on the construction of educational big data information intelligence based on resource sharing. A parallel association rule mining approach for educational big data is proposed in this research. Now, the educational big data is classified, and then, the data is operated. At the same time, a CcG-based educational information resource sharing platform has also been built for educational resource sharing, which can be used for cloud download and upload functions of cloud computing (CcG) for teaching and educational resource sharing. The experimental results of this paper show that the educational information resource sharing platform in this paper processes about 150 information per second, and its service performance must be better than that of traditional educational platforms.

1. Introduction

Compared with the developed countries, the research on the interschool educational resource sharing model of domestic higher education institutions is not so early. With the gradual rise of university towns in China, there was a special study on the sharing model of higher education resources. So far, the existing literature research in China mainly includes the operation mode of university alliance and university town. The China University Alliance mainly realizes the sharing of resources among CU through the joint operation of various CU, through cross-school selection of courses, minor majors and other specific channels, and bold attempts to break through the walls of universities and achieve sustainable development through cooperation and sharing. Most of the university towns in China are government-planned; that is to say, the site is first demarcated and then "built to attract phoenixes," which is different from the university towns formed naturally by natural agglomeration abroad.

The educational resource sharing platform contains a huge amount of information. At this stage, due to the lack of professionals for data classification management, educational resource sharing has caused some inconvenience. In order to solve this problem, it is very urgent to establish a scientific and efficient educational resource sharing platform.

According to the previous research, this paper mainly has the following two innovations: (1) The sharing of ER starts from teaching information as a breakthrough, which is the easiest way to realize in the Internet age. Based on the immediacy of the Internet and the resource storage capability of CcG, the sharing of cloud resources can be realized. (2) This paper proposes a parallel association rule mining algorithm for ER, which is very useful when educational big data is not valued. It can classify data and scan all data in a short time.

2. Related Work

Education is the only way to human enlightenment, and the study of educational equity has always been the focus of scholars' research. Shyam and others took the website model as an example; with the help of this model, functions such as accessing class notes, previous year's question papers, and syllabus and selling users' old books from the same digital platform are realized [1]. In order to meet the rapid growth of educational data, realize the automatic processing of educational data business, and improve operational efficiency and scientific decision-making, Bai and Li designed an educational data statistical analysis platform [2]. Li believe that the different levels of regional development have caused many problems such as regional originality, uneven distribution, and uneven development of China's educational resource platforms. To this end, they plan and develop an educational cloud system and develop resource sharing capabilities [3]. Gao enhanced the design of an educational resource information sharing algorithm in CcG environment to overcome the problem of low level of educational resource information sharing [4]. Al-Darrab and Rushdi analyzed the current situation of education in Saudi Arabia, and their experiments believed that Saudi Arabia must establish a globally connected network education platform [5]. Cui conducted research on cross-cultural online education. They analyzed the advantages of a cloud platform in college English teaching, further constructed a college network English teaching system based on CcG, and discussed the construction of an autonomous learning mode in view of the problems in cross-cultural communication [6]. CcG and big data are very useful algorithms for ER research, as Nunes believes [7]. Majhi conduct unique research on IoT [8]. It can be found that many studies on education are based on school education, and more are aimed at curriculum setting, and there are not many rational studies on ER.

3. Educational Sharing Methods

3.1. ER. "The educational process is carried out on the condition that a certain amount of materialized labor and living labor is invested; that is, a certain amount of human, material, and financial resources are consumed [9]. Since a certain amount of human, material, and financial resources must be consumed, there are problems of saving and waste." The object of saving and waste mentioned here is ER [10]. Chinese scholars have discussed what ER are. Although the expressions are slightly different, they have not yet formed a unified view, but they are basically based on human, material, and financial resources. For example, some scholars believe that "the complete meaning of educational resources should include the sum of all human resources, material resources, and financial resources obtained in the field of education through the allocation of total social resources."

ER can be divided into broad and narrow senses. In a broad sense, ER refer to all resources related to educational activities, including educational human resources, educational financial resources, educational material resources, educational information resources, educational environmental resources, and educational technology resources. ER in a narrow sense refer to the core ER that are most directly and closely related to talent training, including university human resources, university curriculum resources, and university material resources [11, 12]. This article is a research from the narrow sense of ER.

3.1.1. Research Trend of ER. Research on resource sharing in higher education in China is still in its infancy. Searching with "college ER" as a keyword, it was found that related academic research began to appear in 1993 and reached the hottest in 2014, with 31 papers. A total of 231 related papers have been published since 1993 [13], as shown in Figure 1.

However, the existing literature on the interschool ER of CU mainly focuses on the level of "allocation" [14, 15].

3.2. Educational Resource Sharing Model. Although people have an urgent need for higher education resource sharing (ERS), in practice, due to various factors, colleges and universities (CU) are struggling in actual sharing. However, some CU are still at the forefront of exploring the sharing of ER, actively pursuing paths and strategies for putting higher ERS into practice, and have achieved certain results and good results [16]. In general, the paths of educational resource sharing in Chinese higher education institutions can be divided into the following two modes according to different standards. One is the resource sharing model of Chinese universities according to the content of resources; that is, universities reach a consensus on a single aspect of resource sharing and realize resource sharing by signing agreements and other forms. It includes the human resource sharing model with teacher mutual employment as the main form, the curriculum resource sharing model with cross-school elective courses as the main form, and the library and literature resource sharing model with interlibrary loan as the main form. Another type is China's higher ERS model based on external forms. The form of university alliance or university town relies on close cooperation between universities to achieve the sharing of various resources [15, 17].

3.2.1. The Sharing Mode of ER in Chinese CU according to the Content of Resources

(1) A Human Resource Sharing Model with Teacher Mutual Employment as the Main Form. Human resources are the most important and largest resources in running a school. College teachers, especially full-time teachers, are the most critical human resource elements in CU and are directly related to the teaching level and success or failure of CU. In order to strengthen the talent mobility of college teachers and make the existing human resources play the biggest role, some CU have been at the forefront of the times and have actively explored the mutual employment of teachers in the past ten years. Mutual recruitment of teachers is to break down the barriers between CU within a certain area and realize the free flow of college teachers.

(2) Course Resource Sharing Mode with Cross-School Elective Courses as the Main Form. Cross-school elective courses refer to the higher ERS mode in which college students choose other college courses independently according to their own interests and wishes and count the courses they take as electives. With the advancement of reform in China's higher education sector, China's higher education institutions are now fully implementing the credit system, which is conducive to the implementation of cross-school elective courses. Some CU implement cross-school electives in a certain area and recognize each other's credits. As a platform, the

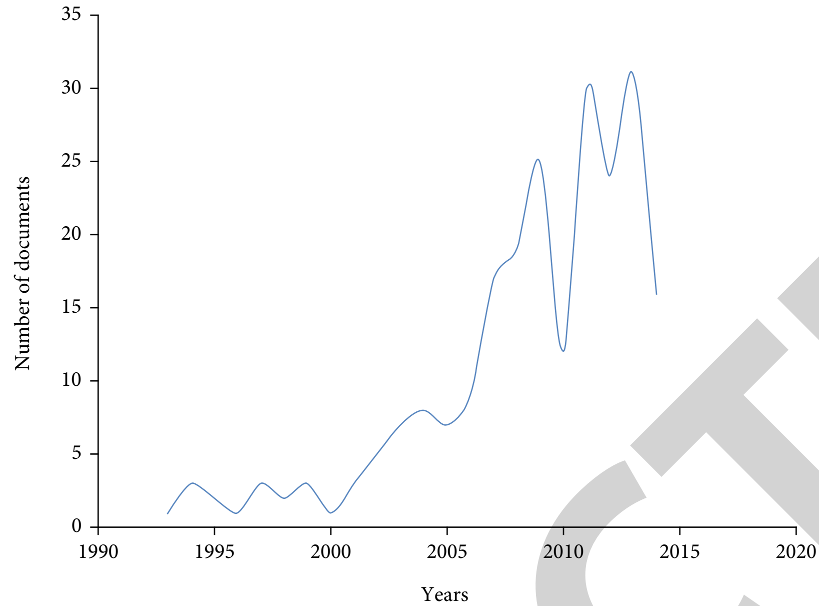

Figure 1: Trends in ER research.

mutual recognition of credits has an indescribable value for interschool resource sharing and is a guarantee for the advancement of cross-school elective courses. So, the resources of famous teachers in CU can play the greatest role in the region and even in the wider area. Students can hear courses that cannot be heard in the school and be recognized by the school, enriching their knowledge and broadening their horizons.

(3) The Sharing Mode of Books and Literature Resources with Interlibrary Loan as the Main Form. Interlibrary loan service is one of the important components of library service, and it is a sharing mode of books and literature resources between universities and colleges. According to the interlibrary loan system and agreement and according to certain charging standards, the exchange and flow of books and documents between the library of the school and the library of other schools are realized. The interlibrary loan mechanism provides a way to solve this problem. Teachers and students in need only need to go to the library to go through the corresponding mutual loan procedures. Through this service, readers of the school can obtain the literature that is missing in the library. Readers from other institutions have the opportunity to use the collections of other institutions' libraries. Relying on the Internet, interlibrary loan has become a common form of library and literature resource sharing in CU [18, 19].

3.2.2. China's Higher ERS Mode Divided by External Form

(1) University Alliance. The Chinese university alliance is mostly a consortium of universities with the same or similar interests and common strategic goals. China's university alliances can be divided into different types from different dimensions. The key university policies implemented in my country vary in the level of universities, and each university is at different levels, and there are great differences. According to the two dimensions of the region where the university is located and the school-running level of the university, the existing university alliances can be divided into four types. The university alliances at the same level in the same region, the university alliances at different levels in the same region, the university alliances at the same level in different regions, and the university alliances at different levels in different regions are shown in Table 1.

(2) University Town. A "university town" is a large-scale university gathering area formed along with the agglomeration of universities in the region. It was first born in Western countries. Taking advantage of the geographical advantages of the agglomeration of CU and through the full utilization of various resources including infrastructure and logistical support by the agglomerated CU in the university city, the mutual sharing of various resources in the university city is realized.

4. Education Big Data Mining Algorithm

4.1. Classification and Characteristics of Educational Data. For students, the online education platform must meet the requirements that students can watch teaching videos and browse teaching content anytime and anywhere. For teachers, it can also allow teachers to create teaching content and arrange course time anytime and anywhere. The data generated on the online education platform is huge and rich. It is also an important task to reasonably classify these data. The general classification method is shown in Figure 2.

The difference between educational big data and traditional big data is reflected in the differences in research objects and applications. Based on a large amount of data information related to individual students, educational big data can analyze and mine all kinds of information hidden behind these data, which is more targeted and personalized. The source of information for each individual in educational big data is generated by individual students in the usual learning process. Through

Table 1: Types of Chinese university alliances.

Divide dimension	Type
Dividing dimensions and university levels	Regional same level Different levels in the same region Different regions at the same level Different regions and different levels

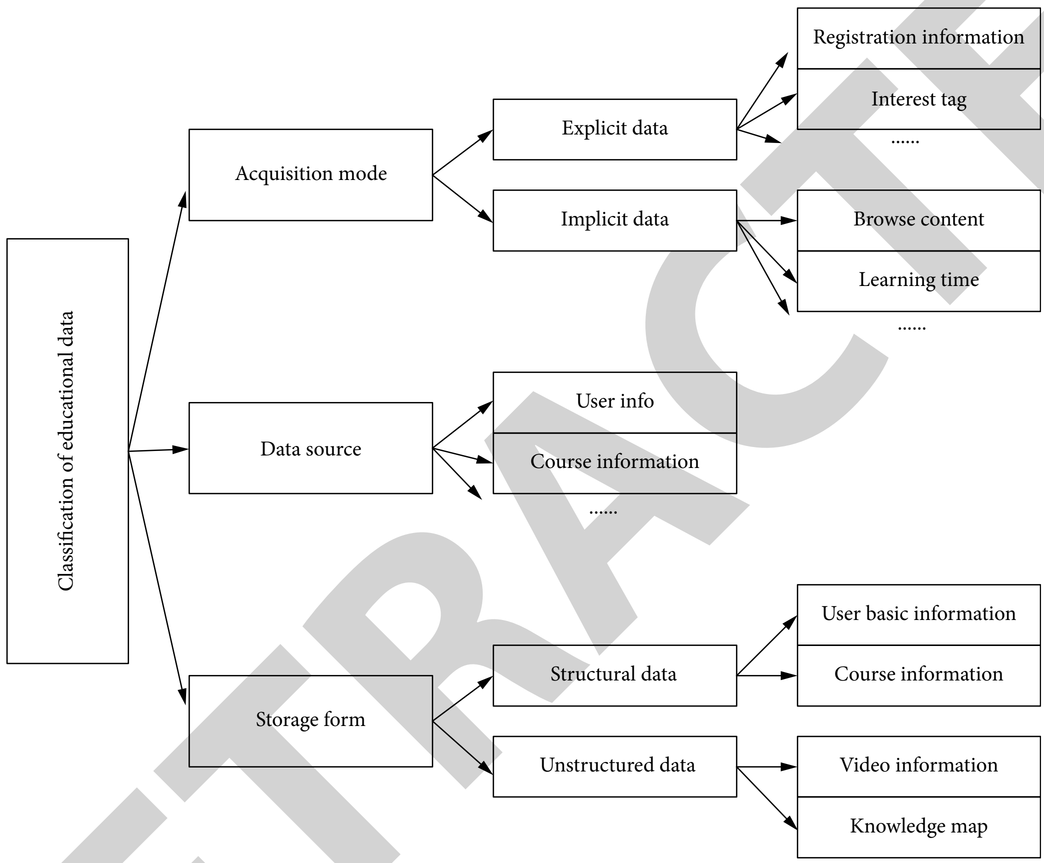

Figure 2: Classification of educational big data.

real-time acquisition and mining of these data, educators can be timely and targeted to guide their educational methods.

4.1.1. Categorized by Acquisition Method. Educational data can be divided into explicit data and implicit data according to the way of obtaining educational data. The information that can be obtained directly is display information, such as user registration information, favorite tags, selected courses, subject scores, forum evaluations, and the like. Information that cannot be seen directly is implicit information, such as search traces, historical tags, and browsing time.

4.1.2. Classification by Source. Data can be divided into personal information, course information, image information, forum interaction information, behavior information, and knowledge graphs through data sources. Personal information specifically refers to the user's basic information, subject scores and study habits, etc.; course information specifically refers to the teaching content, course structure, and other information; image information consists of audio, video, etc. Forum interaction refers to learning posts and exchanges between posters; behavior information includes browsing behavior and watching video records; a knowledge graph is the relationship graph between knowledge points. The drawing of knowledge maps is mostly done by teachers first and then updated and maintained automatically in combination with manual methods.

4.1.3. Classification by Storage Form. Data classification can be divided into structured and unstructured data from the perspective of data storage form. The so-called structured refers to the two-dimensional table structure, and the data that can be stored in the form of a logical structure is called structured data. Structured data refers to the user's basic information, learning content, etc. Unstructured refers to the inability or inconvenience to represent data in a two-dimensional table structure. This type of data is called unstructured data, and information such as image information and knowledge graphs belong to unstructured data.

4.2. Improved Parallel Association Rule Mining Algorithm Based on Educational Data. The improved parallel association rule mining algorithm proposed in this paper includes a denoising autoencoder with sparsity and a softmax classifier. The cost function is expressed as

$$J_I = J_E + \lambda J_W + \beta J_s. \tag{1}$$

In the formula, J_E and J_W are as in

$$J_E = -\sum_{i=1}^{m}[t_i \log y_i + (1 - t_i) \log (1 - y_i)], \tag{2}$$

$$J_W = \frac{1}{2}\sum_{i=1}^{n}\sum_{j=1}^{d} \left(W_{ji}\right)^2. \tag{3}$$

Among them, i represents the number of samples; t_i represents the activation value of the hidden unit i; i and j represent the row and column numbers of the weight matrix, respectively; n and d represent the maximum value of the row and column of the weight matrix, respectively; and λ is the adjustment parameter. The restricted quasi-Newton method is used to calculate J_I and the hidden layer weight W to prevent overfitting of the model. The parameters are updated as in

$$J_I(W_k + \alpha_k p_k) = \min J_I(W_k + \alpha p_k), \tag{4}$$

$$W_{k+1} = W_k + \alpha_k p_k. \tag{5}$$

Among them, α_k represents the hidden layer step size, p_k represents the vector direction, and K represents the number of iterations. The specific restricted quasi-Newton algorithm is as follows:

(1) Select the initial point W_0, there is an error $\varepsilon > 0$, and retain the number of recent iterations m (generally 6)

(2) The parameter calculation is as in

$$\begin{cases} K = 0, \\ H_0 = I, \\ R = \nabla_W J_I(W_0) \end{cases} \tag{6}$$

(3) If $\|R\| \le \varepsilon$, return the optimal solution x_{k+1}, otherwise 4

(4) Calculate the feasible direction of this iteration as in

$$p_k = -r_k \tag{7}$$

(5) If the step size is $\alpha_k > 0$, the calculation is as

$$J_I(W_k + \alpha_k p_k) = \min_{\alpha \ge 0} J_I(W_k + \alpha p_k) \tag{8}$$

(6) Update the weights, as in

$$W_{k+1} = W_k + \alpha_k p_k \tag{9}$$

(7) If $k > m$, save the most recent m vectors and delete (s_{k-m}, y_{k-m})

(8) Calculate and save, such as

$$s_k = W_{k+1} - W_k, \tag{10}$$

$$y_k = \nabla f(W_{k+1}) - \nabla f(W_k) \tag{11}$$

(9) Obtain by recursive algorithm:

$$r_k = H_k \nabla f(x_k) \tag{12}$$

When $k = k + 1$, go to Step 3.

When training the model, each operation requires H_{k-m} and γ_k, which have been verified by countless experiments. The values are as shown in

$$H_k^0 = \gamma_k I, \tag{13}$$

$$\gamma_k = \frac{S_{k-1}^T y_{k-1}}{y_{k-1}^T y_{k-1}}. \tag{14}$$

Among them, S_k is the difference between the weights of two adjacent iterations, y_k is the difference between the partial derivatives of two adjacent iterations, and γ_k is the value of a partial derivative [20, 21].

Then, in order to reduce the value of the cost function J_I, the entire neural network model is trained by continuously repeating the iterative steps of the restricted quasi-Newton method [22–25].

Finally, we can update the weights based on the above parameters to represent the input of the softmax classifier. Suppose $a_i^{(l)}$ represents the output information of the ith unit in layer l. Suppose that when $l = 1$, $a_i^{(1)} = x_i$ represents the ith original information. For the processing of parameters W, b, it can be calculated by using the function $h_{w,b}(x)$. The calculation steps of the neural network are as

$$a_1^{(2)} = f\left(W_{1,1}^{(1)} x_1 + W_{1,2}^{(1)} x_2 + \cdots + W_{1,n}^{(1)} x_n + b_1^{(1)}\right), \tag{15}$$

$$a_2^{(2)} = f\left(W_{2,1}^{(1)} x_1 + W_{2,2}^{(1)} x_2 + \cdots + W_{2,n}^{(1)} x_n + b_2^{(1)}\right), \tag{16}$$

$$a_m^{(2)} = f\left(W_{m,1}^{(1)} x_1 + W_{m,2}^{(1)} x_2 + \cdots + W_{m,n}^{(1)} x_n + b_m^{(1)}\right), \tag{17}$$

$$h_{w,b}(x) = a_1^{(3)} = f\left(W_{1,1}^{(1)} x_1 + W_{1,2}^{(1)} x_2 + \cdots + W_{1,n}^{(1)} x_n + b_1^{(1)}\right). \tag{18}$$

4.3. Algorithm Performance Analysis. It can be seen from Figure 3 that the improved algorithm is more efficient.

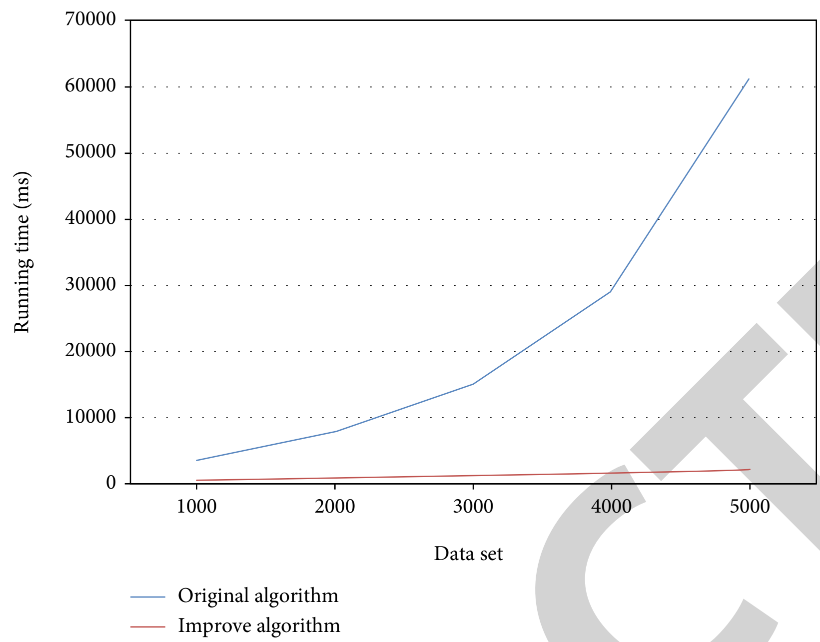

FIGURE 3: Comparison of algorithm efficiency.

Figure 4 is a comparison of running time in different environments. The same kind of data clearly shows that the running time of the improved algorithm is gradually decreasing, which is very good for the algorithm.

5. Educational Resource Sharing System Based on Big Data Platform

5.1. Analysis of Platform Requirements. In the stage of demand analysis, the form of online questionnaire survey was used to collect and analyze the opinions of teachers and students in many CU in the city. The content of the questionnaire mainly includes the investment in education informatization, the management and organization of ER, the school network teaching environment, and the use of resources.

Figure 5 shows the statistics of various educational information resources used by teachers. Judging from the data in Figure 5, providing high-quality education and teaching resources has a great role in promoting teachers' lesson preparation. To advocate education equity and education balance, the first is to enable teachers to be at the same starting line in lesson preparation and test preparation.

Table 2 shows the statistics of network education resources and hardware implementation investment, including network hardware facility construction, learning resource construction, application promotion, and training. It is obvious from Table 2 that in the construction of educational informatization, too much funds are invested in hardware resources, while the proportion of investment in the construction and management of network educational resources that should be paid attention to is very small. Excessive duplication of construction resources has also caused a lot of waste.

The functions to be realized by the educational resource sharing platform are as follows: reclassify and manage all the educational resources that have been collected and aggregated and realize the sharing of data resources on the network. It is necessary to design an educational resource sharing platform with scientific data information classification, strong practicability, and diverse functions. The main functions of the platform should have user registration and login, educational resource management, educational resource browsing, system management module, etc. As can be seen from Table 2, it is unreasonable to pay too much attention to hardware construction.

The overall architecture of the system is shown in Figure 6.

The continuous expansion of the scale of ER, various types, and different representation methods make educational resource sharing a bottleneck for the development of distance education and online education. In order to unify and standardize the information representation and information storage among educational institutions, so as to retrieve the resources needed by users more efficiently and accurately, it is necessary to design and develop a resource sharing platform suitable for the storage and retrieval of massive ER. The platform consists of three systems: a resource sharing platform, a real-name cyberspace, and client software. Users can freely jump between the three to carry out personalized learning, collaborative learning, and communication.

5.2. Platform Function Design

5.2.1. Client Module Design. In the educational resource sharing platform, in order to facilitate management, users must be registered and authenticated before they can log in to the platform. In this way, the security of platform login can be ensured, and different permissions can be set for different users, and corresponding different services can be provided to people with different permissions. The PC-end module provides users with a platform for user communication, which is divided into a friend module, a circle module, a classroom module, an assignment and lesson plan module, and a

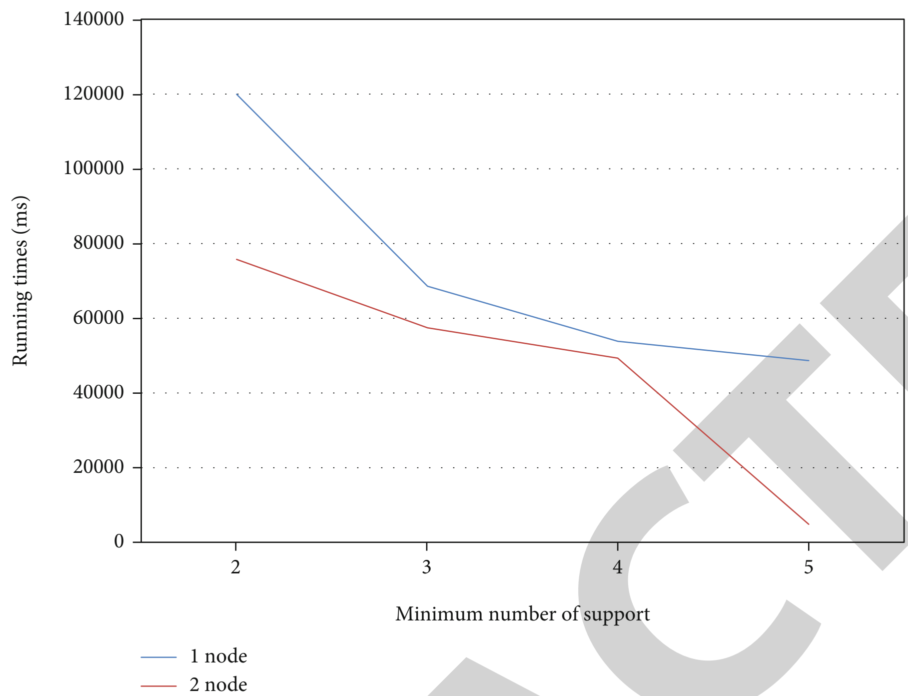

Figure 4: Comparison of algorithm efficiency in parallel environment.

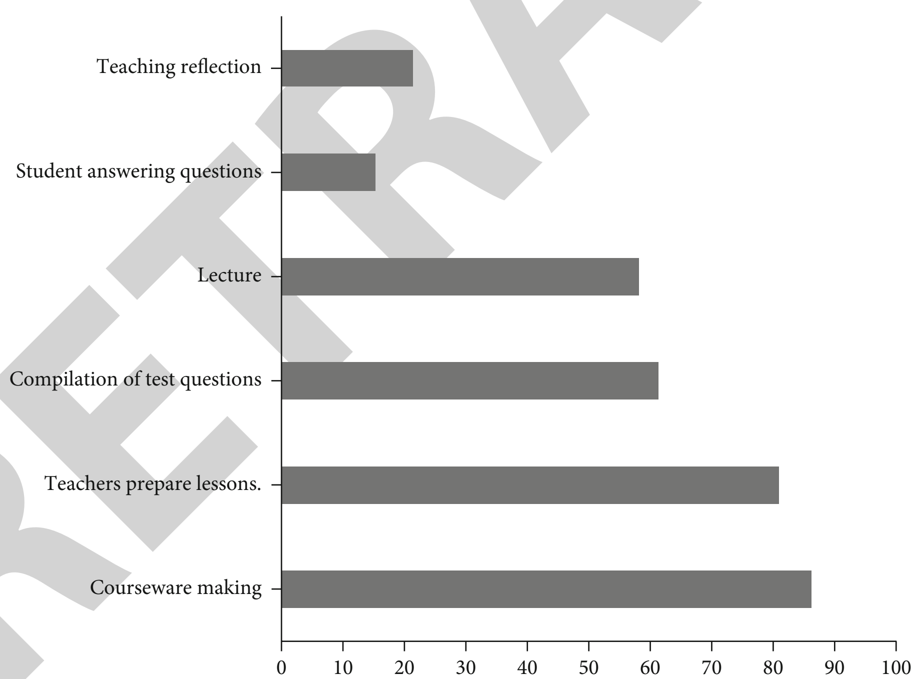

Figure 5: Teachers' use of ER.

comprehensive search module. The comprehensive search module includes four major sections: friend search, circle search, resource search, and class search, as shown in Figure 7.

The platform has three main roles, including system administrators, learners, and resource participants. There is only one system administrator, so that the entire platform can be managed, including the construction and management of the course resource platform. The administrator's authority can be used to add learners in the background. The fundamental purpose of the development of this platform is to share the most complete educational resources to the greatest extent. Most of the registered personnel are for browsing and querying information; that is to say, most of them are learners. Resource participants participate in the construction of educational resources on the educational resource platform and participate in the addition, deletion, and modification of

Table 2: Investment ratio of basic education online learning resources.

Project	Ratio (%)
Hardware equipment	75
And software resources.	12
Application promotion	8
Training	5

resources. Resource participants are responsible for specific resource operations and must be reviewed by the system administrator before operating.

5.2.2. Educational Resource Management Module. The educational resource management module is the core module in the educational resource sharing platform based on cloud computing. In this module, learners can download resources, and resource participants and system administrators participate in related work such as resource uploading and resource deletion. The educational resource management module is the module that supervises the data of the platform. The educational resource management module is the module that supervises the data of the platform. Due to different user rights, the operation rights to resources are different, as shown in Figure 8.

Resource upload is mainly to upload the educational resources that have been reviewed to the corresponding database. In view of the normative and serious nature of educational resource management, any uploading operation of educational resources must be subject to strict review measures, including review of the resource itself and review of resource description information. Resource uploading preparation and resource uploading are done by the user, including filling in the relevant description content of the resource, such as the title, abstract, keyword, and resource category of the educational resource. After the filling is complete, the resource can be uploaded.

After the user uploads the resource, the system administrator must review the resource, mainly to check whether the classification of the resource is correct, and the relevant content is filled in comprehensively. At the same time, some location errors can also be supplemented and adjusted. The resources that have been reviewed by the system administrator can be released directly for users to browse and use. After review, the uploader of the resource needs to give feedback to the uploader. After modification, it can be uploaded without any problems. For resources that have already been stored in the library, authorized users can also update and maintain the resources in the later stage.

For information resources that have been reviewed and completed, the modification of the resources is generally carried out by the original uploader. After the original uploader obtains the resource modification authorization from the resource administrator, the platform archives the information resources to be modified as a new file. The uploader can modify and edit the new file and submit it to the system administrator for review after completing the modification operation.

Resource download is to provide users with the function of downloading corresponding educational resources. For the resource download of the educational resource cloud platform, due to the copyright of the resource, the scope of application of the resource, and the degree of confidentiality, the relevant permissions should be given to different users. Therefore, a permission judgment mechanism needs to be introduced in the process of downloading educational resources.

Resource deletion must be done by the system administrator. The resource deletion operation can be divided into two situations. The first is that the resource uploader applies for resource deletion. For the resource uploader user, when the uploaded resource needs to be deleted, the system administrator must first accept the resource deletion application submitted by the user, and the system administrator will review the application after receiving the application. The second is that due to the needs of platform maintenance, the system administrator deletes resources that meet the deletion conditions, such as duplicate resources and outdated resources.

5.2.3. Platform and Database Module. The platform development and implementation use both relational MySQL database and nonrelational MongoDB database to store structured user information and the MongoDB database to store user folder information, file information, and unstructured data. The reason for using the nonrelational MongoDB database is its flexible data storage method, and the number of files stored in the CcG resource sharing platform is very large. Each user may generate countless file information and folder information, and there is a lot of unstructured data that needs to be stored. The relational database cannot store unstructured data and massive information and must use a distributed database. At the same time, the MySQL database is gradually being used more and more in system development. The MongoDB database is open source. The records in MongoDB are composed of <key, value> pairs, and no fields need to be defined. At the same time, the MongoDB database is very easy to build a cluster, and the scale of the cluster can be dynamically expanded as needed.

The NameNode node of HDFS has implemented the management of file system metadata, so storing the correspondence between users and their own files and folders in MongoDB is beneficial to the management of users' personal files. After the user logs in to the platform through the web page, when entering the personal page, the background program starts to search for the MongoDB database, so that all the files and folders of the user will be displayed on the user's home page, and the user can query and modify resources.

After the education resource cloud data center is established, a suitable CcG platform needs to be selected. The CcG platform mentioned here refers to the layer established above the infrastructure layer, which is mainly used to provide corresponding platform services for software development. The educational resource sharing platform developed in this paper is because the Hadoop platform is open source and free at the same time, and it is precisely because of this that the Hadoop platform is selected. The Hadoop platform selected in this paper can upload, download, and delete related ER.

As shown in Figure 9, the platform is divided into the following modules. The underlying environment includes

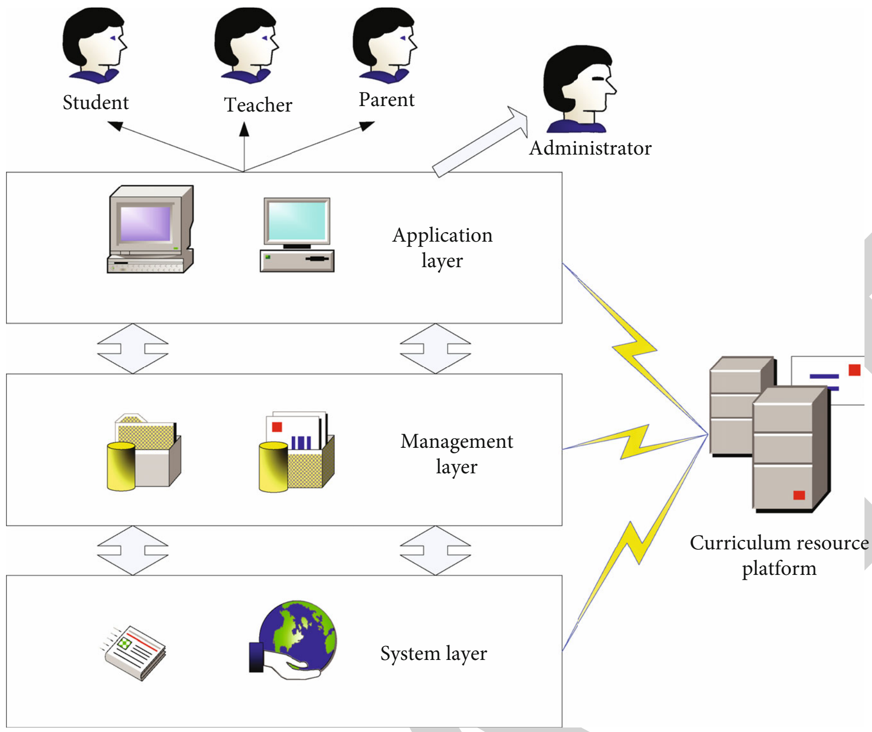

FIGURE 6: Overall system design.

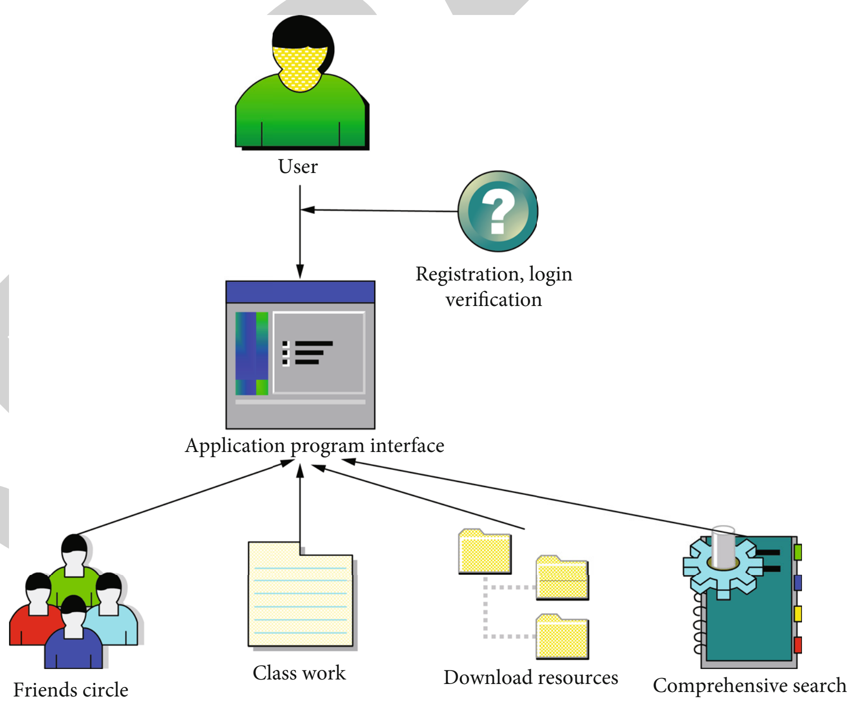

FIGURE 7: Client module.

RDBMS, HDFS, HBase, ZooKeeper, and SolrCloud. HBase and MapReduce depend on HDFS, while SolrCloud relies on ZooKeeper coordination services, and Tomcat containers are required for deployment and implementation. The non-resource module data is in the RDBMS storage platform, HBase stores the core business data related to resources, and SolrCloud stores the RowKey and index information of the data to be retrieved in HBase to provide real-time retrieval services. Above the underlying storage system is the DAO data access layer, which mainly provides access interfaces with relational databases and nonrelational databases to store and access system business data. The top layer

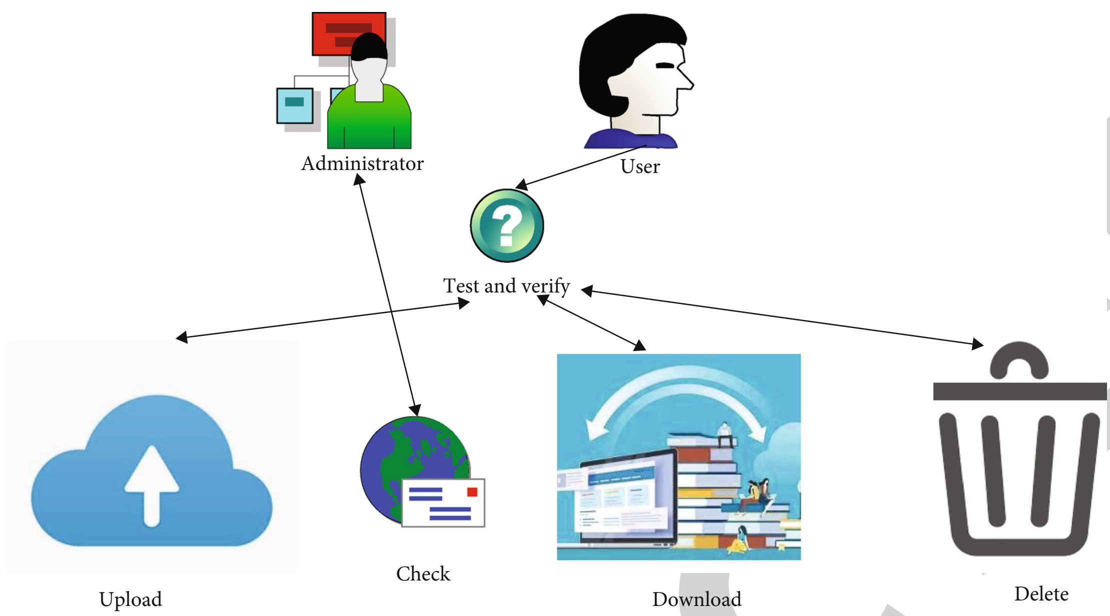

Figure 8: Educational resource management module.

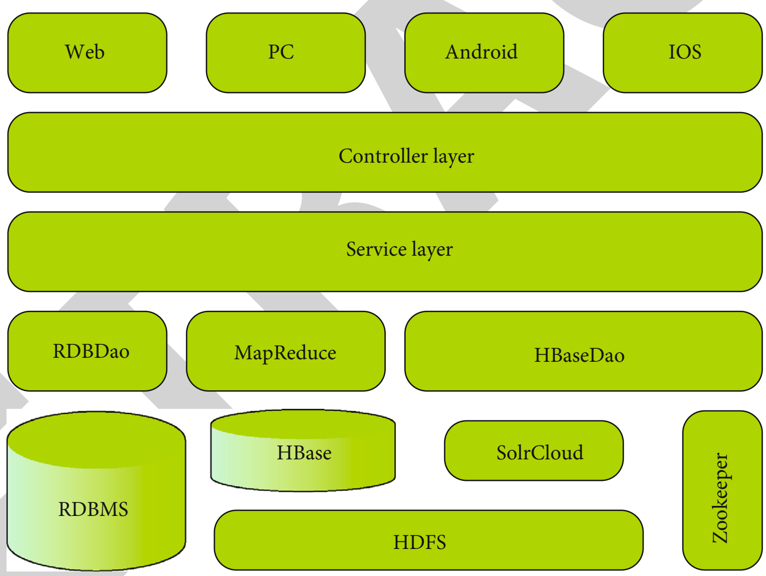

Figure 9: Hadoop cluster architecture.

of the system is the business logic layer and other related functional layers, such as service layer, controller layer, web layer, PC side, Android, and IOS client software.

5.3. System Test

5.3.1. Fatal. It is unable to achieve normal working functions or perform important functions and has serious errors such as system crashes, loss of important data, or memory overflow. It is manifested in the following two points: (1) page disappearance, server error, database error, data loss, data destruction, and memory leak and (2) after an error occurs, test interruption.

5.3.2. Serious. It affects the realization of system requirements or basic functions, and there is no way to correct them; the main functions are not realized or are inconsistent with the product requirement specification, which are reflected in the following 7 points. (1) The menu or button cannot achieve its original function, cannot enter the linked page, and affects the realization of other functions. (2) Actions affect the next process. (3) The button realizes a

Table 3: Statistics by severity level.

Defect severity	Defects	Percentage
Fatal	0	0
Severe	0	0
Generally	7	31.81%
Hint	15	68.18%

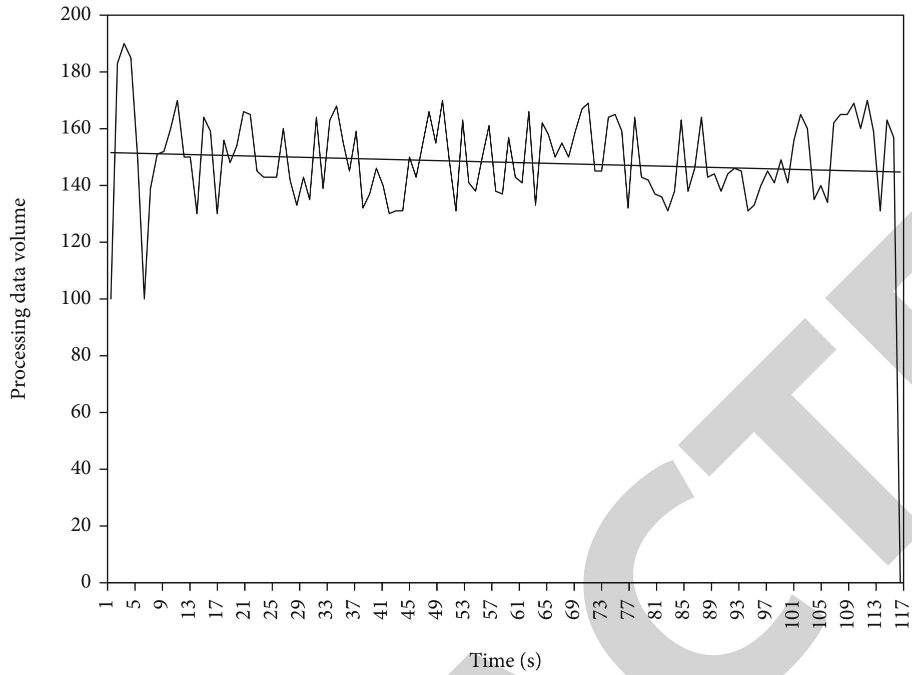

Figure 10: Platform test effect.

function that does not belong to itself. (4) There are missing features. (5) There is loss or corruption of data. (6) Important modules and functions have errors or cannot be implemented. (7) There is page jump error.

5.3.3. *General.* It seriously affects the system requirements or the realization of basic functions, but there are reasonable correction methods; running errors are not functional problems themselves, which are shown in the following 4 points. (1) Each option or button does not realize its own function but does not affect the realization of other functions. (2) The function of data constraint is not implemented. (3) Data constraints are inconsistent with requirements. (4) Minor modules and minor functions are not implemented or have errors.

5.3.4. *Tips.* It makes the operator inconvenient or troublesome, but it does not affect the performance of work functions or important functions, as shown in the following 5 points. (1) The function has been implemented, but there is no prompt information. (2) The prompt message text describes the problem. (3) The page displays the problem. (4) It does not affect the use of defects. (5) There is better implementation.

In this test, the software is classified according to the serious defect level. The test types are shown in Table 3.

Using the Bench4Q Tool for the cluster load test, simulate three sets of concurrent data to observe the performance of the platform, and take 100, 500, 1000, or even larger concurrent data volumes. Through the test data, it can be found that when the amount of concurrent data is less than 1000, the differentiation of indicators such as thinking time and tolerance time is not large. When the data volume continues to grow, the above indicators do not increase with the speed of the data volume growth.

Since there is no significant difference between the data when the amount of concurrent data is less than 800, the amount of concurrent data is selected as 1000 in the performance test, and the data amount test time is about 2 minutes. Figure 10 shows the number of interactions completed by the platform per second, and the data varies with the amount of concurrent data.

In order to rule out the chance of the test, restart the machine after the first test, release the resources occupied by the first test, and perform the second test. The amount of concurrent data is still 100, 500, and 1000. The test results show that indicators such as thinking time and tolerance time are consistent with the first time. It can be seen from the above tests that the advantage of using the Hadoop framework to build an educational resource sharing platform is that when deploying large-scale applications, its service performance must be better than that of traditional educational platforms.

6. Conclusions

Based on the background and significance of the analysis of educational resource sharing, this paper analyzes the traditional educational resource sharing and believes that many current research focuses on the allocation of ER rather than the sharing of ER. In response to this, after analysis, it is believed that the sharing of ER should be based on the sharing of information. In order to break the data barrier, a parallel association rule mining algorithm is proposed to analyze the educational big data, and then, the educational resource big data platform is designed. Although the experimental results in this paper are good, for the establishment of the platform, there is no more in-depth introduction to the Hadoop platform, and its own optimization is proposed.

Therefore, in the follow-up research, we will conduct in-depth research on this aspect.

Data Availability

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Conflicts of Interest

The authors state that this article has no conflict of interest.

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