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Research Article

Performance Evaluation Method of Library Knowledge Management Based on Data Mining

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With the development of information technology and computer technology, the work of the library is becoming more and more digitized and networked. This article mainly studies the performance evaluation method of library knowledge management based on data mining. This paper uses attribute-oriented induction algorithm to mine generalized features. First, scan the entire data set to obtain different values of all attributes. Statistics, classification, and analysis of historical records help to understand the usage of books and periodicals and perform predictive analysis. This article uses statistical weighted weight calculation formula to calculate the library knowledge management ability evaluation index weight. The evaluation of the knowledge management ability of the library mainly adopts the questionnaire survey method, and the knowledge management status of the library is deeply understood in the form of interviews on the spot, and the obtained evaluation data and materials of the knowledge management ability of the library are organized and statistics. In order to prevent the model from remembering the patterns of the training set too deeply, to make the model more general, and to adapt to unknown data well, we use the test set to rest the model. The part of the data set that has not been used in the process of modeling and testing correction can be used to estimate the effect of the model, or to compare the effect of the model. For expert value, the value of the office is 1.02, which is approximately equal to 1, which means that the value and cost of the office are basically equal in the knowledge service of the library. The results show that the combination of knowledge management and university library management will help to form a systematic theoretical framework and behavioral model framework in the research of knowledge management models and strategies in university libraries.

1. Introduction

Data mining technology is the product of today's digital age, and it is widely used in all walks of life, and many scholars have made various updates and upgrades to data mining technology. University library is the palace for university students to learn and acquire knowledge. The library with high efficiency can not only save the time for students to find and search books but also help students solve difficult problems, speed up the progress of learning, and improve their interest in learning to a certain extent. The modern library should understand the laws in these data through the massive data and think about how to apply these laws to the library management, improve the utilization rate of the collection, and better serve the readers. However, the existing higher vocational college library management system can only see some surface data; there is no way to directly understand what kind of connections and rules exists in these data.

Because of the convenience of the Internet, people are more inclined to use the Internet to find the information they need. Through data mining technology, it effectively analyzes, extracts, and mines a large number of information resources accumulated in the library management system of a university library and provides a scientific reference basis for the efficient, scientific, and high-quality management of university libraries. As people's pursuit of knowledge is more active now, citizens' cultural needs for libraries have become higher, and only more efficient management can make libraries meet people's needs.

Knowledge management of digital libraries is an inevitable trend in the development of library science and technology. Huang et al. believe that in a dynamic environment, the data collected from actual applications varies not only with the number of objects but also with the number of functions, which will lead to constant changes in knowledge over time. Considering the fuzzy environment of the decision-making state in the universe description, they aim to provide an effective method to calculate a rough approximation of the fuzzy concept of the simultaneous change of objects and features in a dynamic fuzzy decision system (FDS). They first gave a matrix-based representation based on rough fuzzy approximation through the Boolean matrix associated with the matrix operator in FDS. While adding objects and features, they introduced an incremental mechanism for updating rough fuzzy approximations and developed corresponding matrix-based dynamic algorithms. They use the previous matrix information and the interactive information of each submatrix to locally update each submatrix to avoid unnecessary calculations. Although their algorithm is more efficient, there are some loopholes [1]. Money and Cohen analyze the attributes of unknown failures in real-time processing of big data in knowledge management and big data systems. He assumes that failures that have not yet been encountered may require failure handling, analysis models, and architecture frameworks to assess and manage failures and reduce the risk of associating or integrating previously unrelated big data and to ensure the integrity and freshness of source genealogy and collection data degree and effectiveness. Although his research has certain value, the variables considered are not comprehensive [2]. Mahdi et al. believe that in modern times, organizations have realized that acquiring and effectively using knowledge is the only way to have a sustainable competitive advantage (SCA) in the market. This means that the resources of the organization must include knowledge, and knowledge should always be taken care of and developed. They will study how KMP creates SCA from KBV and RBV in educational environments. To achieve this goal, they created a hypothetical and designed quantitative survey method. He used deductive methods to help determine the relationship between variables. Although his research has certain theoretical significance, it lacks innovation [3]. Zakin et al. emphasized the importance of correctly managing the characteristics of employees through their education, that is, their education level, which is of great significance to the development and application of knowledge management and thus to the productivity and competitiveness of enterprises. They aim to determine the impact of respondents' educational level (independent variable) on the dimension of knowledge management (dependent variable). They believe that adequate selection of human resources will affect the aforementioned organizational units in the enterprise. Although his research is more accurate, it lacks necessary survey data [4]. It can be found that most scholars choose to apply management knowledge to knowledge management, and the research is more generalized, and there is no detailed research on a certain object.

This paper selects the combination of knowledge grid technology and university library knowledge service and turns the research perspective to the object of university library based on knowledge grid, making the performance evaluation research more pertinent. According to the basic activities of the library knowledge management process and value chain, analyze the content and ability elements of the library's knowledge management capability; analyze the library knowledge management based on the strategic goals, organizational culture, personnel, technology, etc. in the auxiliary activities of the knowledge value chain influencing factors of ability.

2. Performance Evaluation of Library Knowledge Management

2.1. Data Mining. Data mining is a hot issue in the field of artificial intelligence and database research. The so-called data mining refers to the nontrivial process of revealing implicit, previously unknown and potentially valuable information from a large amount of data in the database [5]. With the rapid development of science and technology, the amount of data obtained by all walks of life is increasing, and the information contained in these data is also increasing in geometric multiples. A large amount of data and information has brought convenience to people but also caused a series of problems: first, the data is huge and difficult to digest; second, the authenticity of the data is difficult to identify; third, the security of the data is difficult to guarantee; the fourth is the data. The structure is inconsistent and difficult to deal with in a unified manner. In order to solve the above problems, to find useful information and knowledge in time from the huge data, and to improve the utilization rate of data, data mining technology came into being, has been vigorously developed, and has gradually become the most current database and information decision-making field [6, 7].

This paper uses the clustering method in big data mining technology to optimize library management, where $\mathrm{sim}(*)$ represents the similarity function, and the higher the value, the greater the similarity [8]. The similarity of books reflecting the interest of readers reflected by the borrowing time is as follows:

$$\mathrm{sim}(x, y) = \frac{1/2\left(T_{1x} + T_{2y}\right)}{(1/(m+n))\left(\sum_{j=1}^{m} T_{1j} + \sum_{j}^{n} T_{2j}\right)}, \quad (1)$$

where x and y represent two books borrowed by two readers with exactly the same classification index number [9].

Assuming that two books are denoted as a and b, respectively, $\mathrm{NCA}(a, b)$ is the nearest common ancestor of the book classification numbers of a and b; the similarity of books a and b is

$$\mathrm{sim}(a, b) = \frac{d(NCA(a, b))}{(d(a) + 1) + (d(b) + 1) - d(NCA(a, b))}, \quad (2)$$

where $d(a)$ and $d(b)$ are the depths of the classification numbers of books a and b in the book classification index distribution tree, respectively.

The interest distances between readers are as follows:

$$D(S_1, S_2) = \frac{1}{1 + \sqrt{\sum_{i=1}^{k} \mathrm{simi}^2}}. \quad (3)$$

Assume that each sample is composed of multiple training attributes $A_k(K = 1, 2, \cdots, k)$ and prediction attributes. Divide N samples into a set of c different samples, and the number of samples in the category C_i is N_i. The initial amount of information in the decision tree is

$$I(C_1, C_2, \cdots, C_C) = \sum_{i=0}^{C} - \left(\frac{N_i}{N}\right) \log_2 \left(\frac{N_i}{N}\right). \quad (4)$$

Select the training attribute as the classification node. When each training attribute is set to $A_k(K = 1, 2, \cdots, k)$ and the number of samples belonging to the category C_i is n_{kji} for the n_{kj} samples of each branch, the expected entropy based on the training attribute A_K is as follows:

$$E(AK) = \sum_{j=1}^{J} \sum_{i=1}^{I} \left(\frac{n_{kj}}{N}\right) * \left(\frac{-n_{kj}}{n_{kj}}\right) * \log_2 \left(\frac{n_{kji}}{n_{kj}}\right). \quad (5)$$

The information gain $\mathrm{Gain}(S, D)$ can be expressed as

$$\mathrm{Gain}(S, D) = I(S_1, S_2, \cdots, S_m) - E(S, D). \quad (6)$$

In the expression, $E(S, D)$ represents the entropy weight of k subsets divided by the quotient of attribute D. Information items can be displayed individually as

$$\mathrm{Split\_Info}(S, D) = -\sum_{i=1}^{k} \left(\frac{|s_i|}{s} \log_2 \frac{|s_i|}{s}\right). \quad (7)$$

The more uniform the value distribution of the samples in the attribute D, the larger the value of the divided information item. The gain ratio can be expressed as

$$\mathrm{GainRatio}(S, D) = \frac{\mathrm{Gain}(S, D)}{\mathrm{Split\_Info}(S, D)}. \quad (8)$$

Transfer function $f(x)$ often uses nonlinear functions; common ones are the following:

(1) Sigmoid type function (S function):

$$f(x) = \frac{1}{1 + \exp(-x)}. \quad (9)$$

(2) Hyperbolic tangent function:

$$f(x) = \tanh(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}. \quad (10)$$

(3) Gaussian function:

$$f(x) = \exp\left(-\frac{1}{2{\sigma_i}^2} \sum_j (x_j - w_{ji})^2\right). \quad (11)$$

For the two elements x and y, if the sample values are set to x_i and $y_i\,(i = 1, 2 \cdots, n)$, the correlation coefficient calculation formula between them is as follows:

$$R = \frac{\mathrm{cov}(x, y)}{\sqrt{D(x)} * \sqrt{D(y)}}. \quad (12)$$

In the formula, R is the correlation coefficient, and cov (x, y) is the covariance of x and y.

Let $f(x, p)$ and $f(x, q)$ be the equivalent probability distribution on χ, and then, the estimate of e is

$$\widehat{e} = \frac{1}{N} \sum_{i=1}^{N} I_{\{S(x_i) \geq \gamma\}} \frac{f(x, p)}{f(x, q)}. \quad (13)$$

Using the Hausdorff distance formula, the optimal parameter solution can be derived as

$$v^* = \arg \max_{v} E_u I_{\{S(X) \geq \gamma\}} \ln f(X; v). \quad (14)$$

2.2. Library Knowledge Management. Through the collection, processing, and arrangement of knowledge information, the disordered information can be turned into order, the solidified knowledge can be activated, and the library's literature and information resources can be continuously strengthened, including digital and nondigital construction and in-depth development [10]. In addition to the teaching reference materials of the subject, the needs of students are also very sensitive to some hot topics such as politics, economics, culture, art, and other subjects. Both teachers and students are engaged in the accumulation, transfer, and storage of knowledge and create new value through the integration of knowledge. Therefore, this objectively requires university libraries to not only collect, store, organize, and transfer knowledge and information with high efficiency; it is necessary to grasp the interrelationship of knowledge

and use creative work to create new knowledge to meet the needs of readers [11, 12].

In daily work, through the knowledge exchange between the staff in the library and the information communication with the readers, the staff should be encouraged to obtain inspiration and enlightenment from the different knowledge structures and knowledge fields and the scattered knowledge in the individual minds, integrate into the powerful knowledge power of the entire organization, and transform it into actions of knowledge innovation, so that the overall knowledge level and work ability of employees can be adapted to the continuous development of library business, so that the subjective knowledge and potential energy of employees get the maximum play in the work, so as to promote the development of the library business with the improvement of staff knowledge level [13, 14].

The purpose of management is to improve the efficiency and effectiveness of the organization and the efficiency in the general sense; the emphasis is to get more output with as little input as possible in a certain period of time. The effect refers to the consistency of the organization's output and the strategy of the enterprise's goals. Knowledge management is to emphasize the effects of organizational activities. Through knowledge management, the results of organizational activities are consistent with organizational goals [15].

2.3. Performance Evaluation. The library's business norms and librarians' behavior standards should be quantified as specific data, which is the objective standard to measure whether the work has reached the goal. First of all, in the selection of indicators, it is necessary to select the appropriate statistical unit and statistical range, enhance the evaluation and analysis function of indicators, and ensure the measurability [16]. Most of the performance appraisal methods in the field of enterprise management only pay attention to the quantitative indicators, so they cannot be simply applied to the performance evaluation of library organization, while the traditional evaluation and appraisal system of library mostly evaluate and judge the library work from a qualitative perspective, with strong subjectivity [17].

The balanced scorecard introduces the qualitative indicators into the quantitative system, which gives good consideration to the objectivity and operability. Because it is just a simple design of a series of indicators and the organization of experts to carry out performance evaluation, it can only be a superficial form and cannot find the fundamental problems existing in the internal. Only when the internal management is perfect can the performance evaluation be meaningful. In addition, if the internal control management procedure is regarded as the evaluation object, it will greatly increase the number of evaluation indicators and increase the workload [18]. In summary, internal control and index establishment are not equal. On the contrary, only when the internal control system management is perfect, the index evaluation can be carried out effectively. At the same time, it is necessary to carry out internal control first, which needs regular investigation. In order to achieve the ideal effect of performance evaluation, it is necessary to conduct internal control evaluation first. Only in this way can we find the root of the problem [19].

The evaluation index project should be based on a large number of statistics, calculation, research, and practice and develops quantitative analysis indexes for quantifiable projects; the collection of original data of various statistical indexes must be true and effective, the collection methods and ways should be scientific and reasonable, and the whole process should fully implement the scientific principle [20]. For the establishment of the evaluation index system, we should strictly use scientific methods and means, fully show the advanced technical requirements, improve the applicability and operability of the index system, and conform to the actual level of the library, so that the evaluation results have strong persuasion, and better reflect the advantages and disadvantages of library performance. Evaluation must be operable to implement, to obtain evaluation results and to achieve evaluation objectives. The availability of evaluation data is an important aspect of manipulability principle. Abstract concepts should be materialized into testable simple variables [21].

3. Performance Evaluation Experiment of Library Knowledge Management

3.1. Data Preprocessing. The important object of this system analysis is the data generated by the usual borrowing behavior. The above two types of data may produce incomplete, noisy, and inconsistent situations. Before actual mining, data must be preprocessed. Use attribute-oriented induction algorithm to mine generalized features [22]. First, scan the entire data set to obtain different values of all attributes. Statistics, classification, and analysis of historical records help to understand the usage of books and periodicals and perform predictive analysis. The selection of indicators follows scientific design principles to ensure that all indicators are comprehensive, scientific, and operable, and the indicators are verified and selected through expert analysis. The relevance of knowledge service indicators based on the knowledge grid is ensured, and the main impact factors are summarized and analyzed, so that the indicators and levels in the indicator system are independent of each other [23].

3.2. Construction of Library Performance Evaluation Index. According to the basic principle of fuzzy evaluation method, this paper divides each level into three parts: target level, measurement level, and effect level. The target layer is the comprehensive performance of the library's knowledge transfer, while the measurement layer is the contingency factor to evaluate the target layer, and the main function of the effect layer is to show that the library absorbs and innovates the knowledge after the knowledge transfer and shows the main aspects or explicit characteristics of the relevant knowledge after the use [24, 25].

3.3. Determining the Weight of Knowledge Management Ability Evaluation Index. According to the analysis of the components and influencing factors of library knowledge management ability, the design principle of evaluation index, and the idea of ability set analysis, this paper lists an evaluation index set. A total of 20 experts, library knowledge

Table 1: Distribution of survey personnel and questionnaire recovery.

Post	Number of questionnaires issued	Number of questionnaires returned	Questionnaire response rate
Librarian	7	6	85.7%
Library science teacher	6	5	83.3%
Library science graduate	12	12	100%
All investigators	25	23	92.0%

management researchers, and librarians were surveyed by e-mail. On the premise that they understand the analysis and evaluation of knowledge management ability proposed in this study, each type of index was ranked and scored [26]. This paper uses the statistical weighting formula to calculate the weight of the evaluation index of library knowledge management ability. The evaluation of the library's knowledge management ability mainly adopts the method of questionnaire survey and has a deep understanding of the library's knowledge management status in the form of on-site interview and collates and counts the obtained evaluation data and materials of the library's knowledge management ability [27].

3.4. Establishment of Prediction Model. In order to prevent the model from memorizing the training set too much, make the model more general, and adapt to the unknown data well, we use the test set to rest the model. The part of the data set that has not been used in the process of modeling and test correction can estimate the effect of the model, or compare the effect of the model [28]. Factor analysis summarizes and analyzes the complex relationship between the various impact factors through dimension reduction, judges the degree of correlation between the various impact factors, groups the indicators according to the degree of correlation, and comprehensively sorts out the indicators with high degree of correlation, so as to obtain the representative impact factors. This paper uses the fuzzy mathematics method to calculate all the data, push down the fuzzy evaluation matrix, compare the performance evaluation system values, study the advantages and disadvantages of library knowledge management system through quantitative data analysis, and improve library knowledge management through policy changes and mechanism construction [29, 30].

4. Performance Evaluation Results

4.1. Model Analysis. Through empirical analysis, it is verified that there is a significant positive correlation between knowledge organization methods, knowledge organization tools, knowledge storage, knowledge organization technical standards, and digital library knowledge organization performance (the significance level p value is less than 0.001) and its role. The effects are 0.285, 0.112, 0.379, and 0.410. It shows that the four aspects of knowledge organization methods, knowledge organization tools, knowledge storage, and knowledge organization technical standards can be improved to promote the performance of digital library knowledge organization. In order to comprehensively and objectively reflect the views of the service providers and users on the importance of various factors in the library system while ensuring the professionalism and representativeness of the survey data, this article distributed 25 questionnaires through interviews and e-mails. The distribution of investigators and the questionnaire response are shown in Table 1. From the data in the table, it can be seen that 23 questionnaires were returned with a recovery rate of 92.0%; 23 valid questionnaires were returned with a recovery rate of 92.0%.

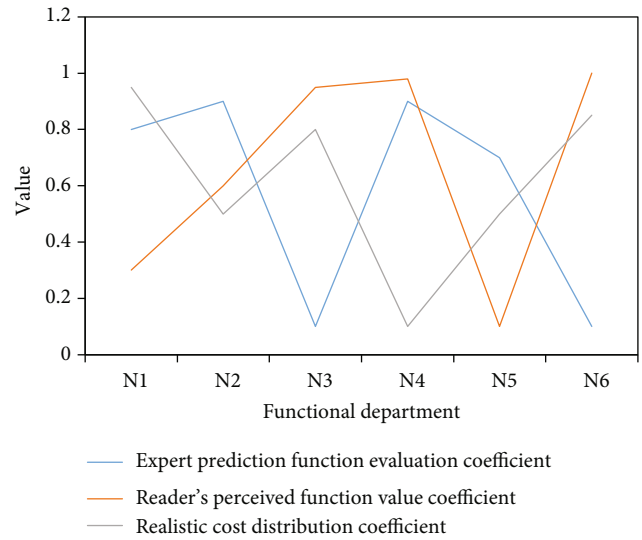

Figure 1: Earned value evaluation curve.

The earned value evaluation curve is shown in Figure 1. In this curve, you can clearly see the comparison results of the reader's perceived function value coefficient, the actual cost distribution coefficient, and the expert's predicted function evaluation coefficient of each department in the library, and it is also a more intuitive evaluation and assessment of each library. The actual situation of the department created conditions. Using value analysis and earned value methods, it is possible to evaluate the knowledge service of the library from multiple perspectives, making the evaluation results relatively comprehensive. Therefore, the two cannot be substituted for each other, but a complementary relationship. Secondly, in the earned value method, only a simple analysis of the relationship between the actual value, the predicted value, and the earned value is done. In fact, according to their mutual numerical situation, different results will be obtained, and the decision-maker should make judgments

Table 2: The value of each department of the library.

Department	Expert prediction function coefficient	Reader perception function evaluation coefficient	Cost factor	Expert value	Reader value
Reader service department	0.036	0.146	0.13	0.28	1.12
Acquisition and editing department	0.145	0.11	0.18	0.805	0.61
Information department	0.56	0.46	0.43	1.3	1.069
Office	0.216	0.195	0.21	1.02	0.93
Automation department	0.048	0.08	0.06	0.81	1.3

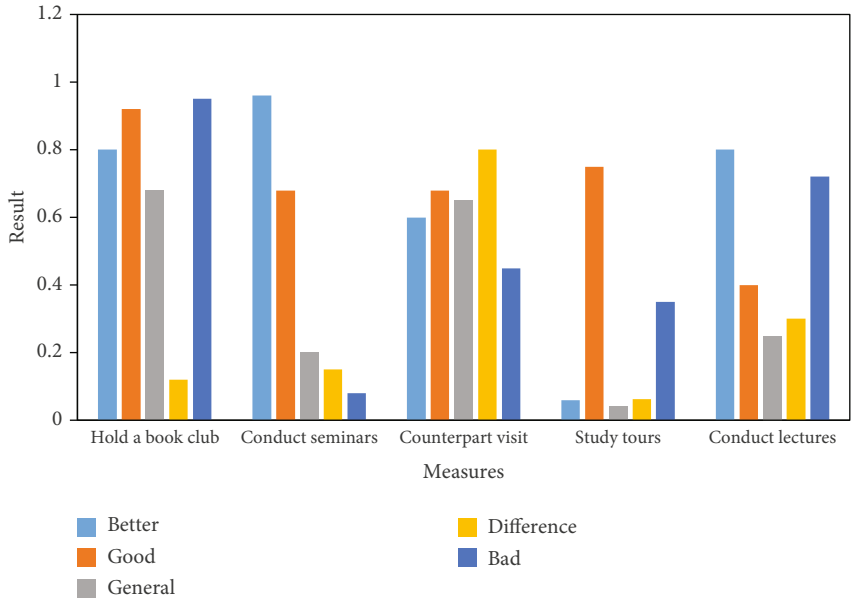

Figure 2: Survey statistics of measures to promote knowledge sharing among library staff.

on the actual situation in order to give the necessary help to enhance the value of the knowledge service of the library [31].

The value of each department of the library is shown in Table 2. The value of the expert and the predictive function coefficient can clearly show that the value of the office is 1.02 for the expert value, which is approximately equal to 1, which means that the value and cost of the office are basically equal in the knowledge service of the library. The value of the ministry of information is 1.3, which means that the department's cost input is too low, leading to the possibility of a decline in actual functions. This is also a common phenomenon in many libraries in our country. The value of the reader service department is 0.26, which means that the department has invested too much cost, which may occupy the corresponding resources of other departments, so its functions should be rearranged to reduce costs as much as possible.

Figure 2 shows the survey statistics of measures to promote knowledge sharing among library staff. The results show that the library has taken a variety of measures to promote employee knowledge sharing, and most of the pictures can improve the management function of the library based on user feedback and actual needs. Carrying out daily seminars is also a main method of library knowledge sharing and again is to hold regular seminars. These are all powerful measures for the socialization and internalization of employees' tacit knowledge. However, academic libraries in Hefei have not paid enough attention to knowledge management, and no library has set up a specialized knowledge management department.

The library document collection situation is shown in Figure 3. The document collection of the library is fair. Most college libraries have purchased certain electronic resources, and the collection of documents can basically meet the needs of students' clothing. The construction of characteristic literature resources is relatively weak, and many colleges and universities do not have characteristic literature resources.

The results of KMO test and Bartlett sphericity test are shown in Table 3. According to the test results, the criterion for analyzing whether it is suitable for factor analysis is that when the KMO is greater than 0.9, the research data is very suitable. The test result of this article is 0.92, which is considered to be very suitable for factor analysis; at the same time,

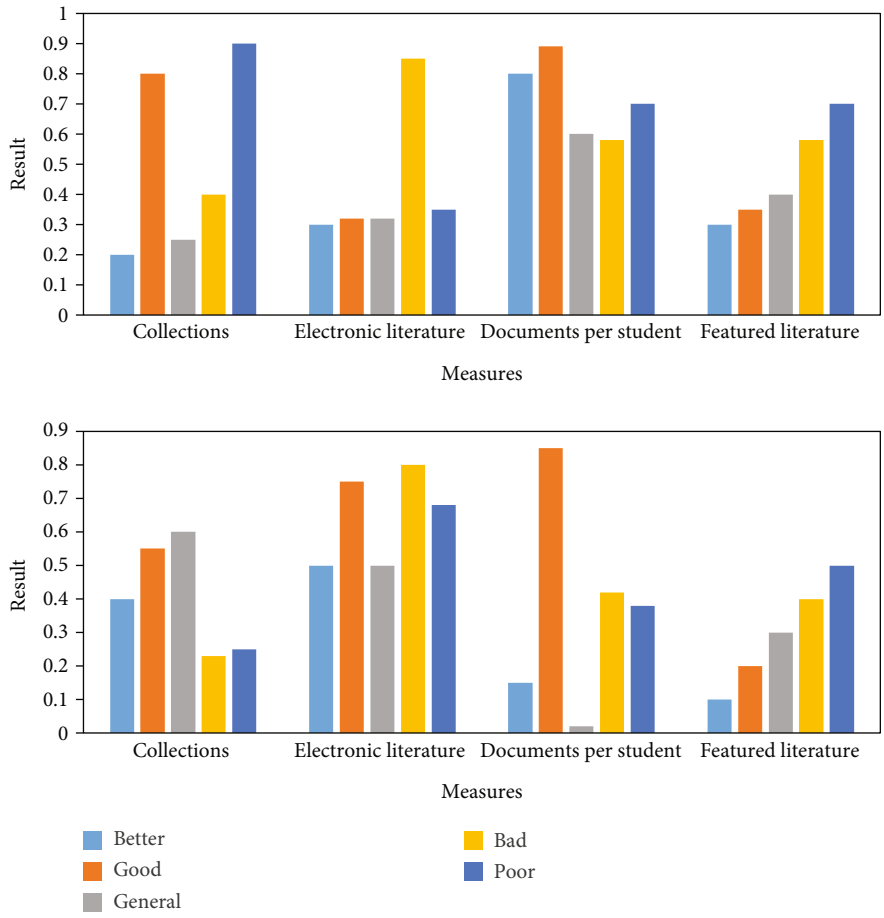

Figure 3: Library document collection.

after comparing the KMO test standard, it is still to analyze and compare the Bartlett sphere test, and the result of this paper is 0.000 less than the significance level of 0.05, which is very suitable for factor analysis.

The correlation degree of public library indicators is shown in Figure 4. It can be seen from the figure that the data between the performance evaluation indicators of public libraries are relatively large. For example, the correlation between archives management and personnel management indicators has reached 0.675, and the correlation between archives management and personnel management indicators has even reached 0.690. The correlation between the quality of the collection and the service for special groups is as high as 0.707, and the building conditions and funding also have a high correlation of 0.721; the correlation between building conditions and modern technical conditions is 0.725, and the correlation between financial management and personnel management is 0.670, indicating that the index carrying information is repeated, which requires deletion or combination.

4.2. Fuzzy Comprehensive Evaluation Analysis. The total variance explained by the principal components of public libraries is shown in Table 4. It can be seen from the table that the eigenvalue data of the first seven main factors are relatively high, and the cumulative contribution rate reached 80.731%. In the factor analysis, the cumulative contribution rate reached 80%, so it is considered suitable for factor analysis. The library performed well in the construction of the librarian team, the construction of literature resources, and the hardware investment. In contrast, the proportion of personnel who can provide knowledge services and the proportion of knowledge service businesses are low, reflecting the lack of efficiency in resource utilization of the library.

Table 3: KMO test and Bartlett sphericity test results.

Kaiser-Meyer-Olkin measure of sampling	Adequacy	0.920
Bartlett's test of sphericity	Approx. chi-square	3316.284
	df	561
	sig.	0.000

Table 5 shows the internal reliability measurement results of the common factors of competence. The internal reliability measurement values of the four dimensions are between 0.724 and 0.815, which shows that the internal consistency of the questionnaire measurement is good, and its total reliability is 0.935, which is high. The sustainable

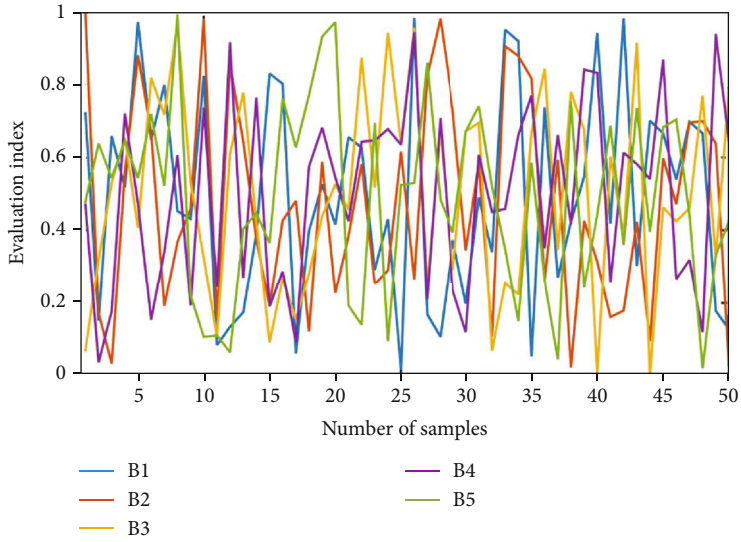

Figure 4: Correlation degree of public library indicators.

development of university libraries is the basic guarantee for universities to continue to provide knowledge information services. It not only requires the continuous efforts and progress of the university library itself but also the support and help of relevant partners. The knowledge management of university libraries in the future is a comprehensive element system and value chain; each subelement gives full play to its own value and ensures the reasonable and orderly flow of the library value chain and can ensure the effective development of the knowledge management work of university libraries.

The model fitting index is shown in Figure 5. According to MacCallum's theory, when the RMSEA value is less than 0.08, it shows that the fitting degree of the model is good. Comparing the scores of each index with the theoretical maximum and minimum, it can be found that the development level of knowledge association ability and knowledge structure expression ability of the three is obviously better than other abilities, but the development level of knowledge depth analysis ability and knowledge development technology support ability is relatively low.

The cumulative gains produced by different models are shown in Figure 6. For a normal model, the effect of the model on the training set should be better than the effect on the test set, and the effect on the test set is better than the effect on the evaluation set. The gain curve should start from a steep slope and then slowly become level. In the cumulative gain graph, the curve of the test set should be below the curve of the training set and above the evaluation set.

4.3. Knowledge Management Factor Analysis. The average changes in the efficiency of knowledge services in university libraries are shown in Table 6 and Figure 7. On the whole, the total factor productivity of knowledge services in colleges and universities declined first and then rose, and the overall trend is weaker. Among them, the comprehensive efficiency of university knowledge service has an average annual growth of 0.2%, which

Table 4: Total variance explained by principal components of public libraries.

Ingredients	Extract square and load cumulative%	Rotate the sum of squares loading		
		Total	Variance %	Accumulation %
1	42.667	5.224	15.365	15.365
2	50.842	4.617	13.578	28.943
3	55.672	4.111	12.091	41.034
4	59.707	2.634	7.746	48.780
5	63.535	2.585	7.603	56.383
6	66.785	2.523	7.421	63.804
7	69.731	2.015	5.928	80.731

shows that the input and output scale of university libraries for knowledge service based on knowledge grid is expanding. The total factor productivity has seen an average annual decline of 7.9%, technological progress has seen an average annual decline of 8.6%, and overall efficiency has seen an average annual increase of 0.8%. It can be seen that the decline in total factor productivity of knowledge services in academic libraries based on knowledge grids is due to the decline in knowledge service technology, and the increase in the overall efficiency of knowledge services in academic libraries based on knowledge grids cannot change the decline in productivity caused by the decline in technology influences.

The reliability and validity analysis of the target layer is shown in Figure 8. On the whole, the consistency reliability coefficient based on the α coefficient exceeds 0.9, far exceeding the standard of 0.7, indicating that the construction of the entire digital library's knowledge service capability evaluation index system has ideal reliability. The results of statistical analysis show that the understanding of the dimensions

Table 5: Intrinsic reliability measurement results of common factors of competency.

	Work attitude	Ability to work	Values	Individual charm	Total reliability
Alpha coefficient	0.724	0.815	0.799	0.807	0.935

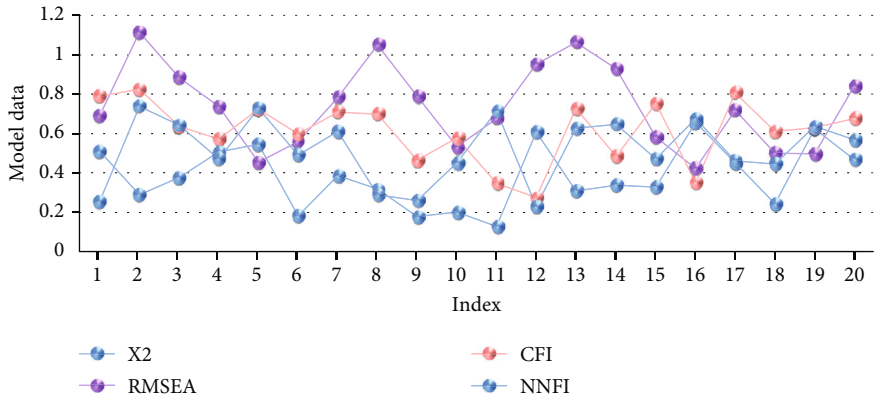

Figure 5: Model fit index.

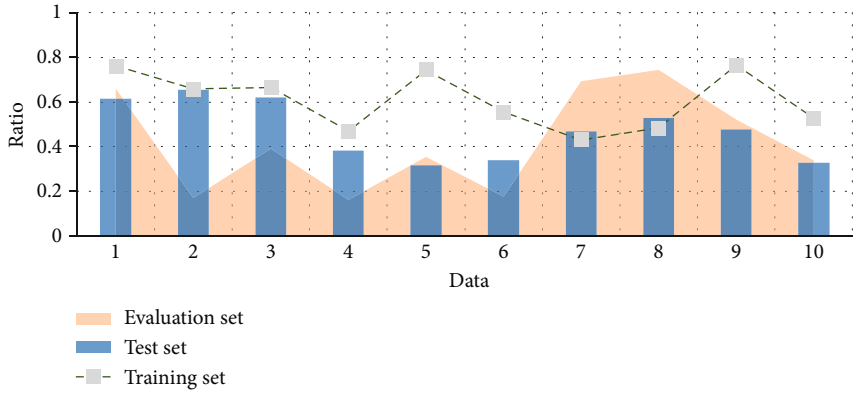

Figure 6: Cumulative gains produced by different models.

Table 6: Average changes in the efficiency of knowledge services in academic libraries.

EC	TC	PEC	SEC	TFP
0.908	1.076	0.944	0.963	0.978
1.027	0.776	1.013	1.044	0.821
1.082	0.926	1.007	1.004	0.971

of the digital library's knowledge service capability evaluation index system is basically consistent with the essence of the original theoretical analysis, which ensures the consistency of the logical analysis and empirical research of this study. The questionnaire can be used to evaluate and measure the knowledge service capabilities of digital libraries.

5. Conclusions

Readers borrow related books from the library according to their own needs and hobbies. The information on the books borrowed by readers reflects the reader's reading tendency and the relationship between books. On the basis of theoretical analysis, it comprehensively analyzes the influencing factors of the knowledge service ability of digital libraries from the perspective of knowledge service process ability, and based on this theory, constructs the evaluation index system of the knowledge service ability of digital libraries, and adopts principal component analysis. Methods to test the reliability and validity of the evaluation index system determine the index weight.

With the development of society and the advancement of modern technology, database management systems are widely used in university libraries. Especially with the continuous deepening of teaching reform in higher vocational

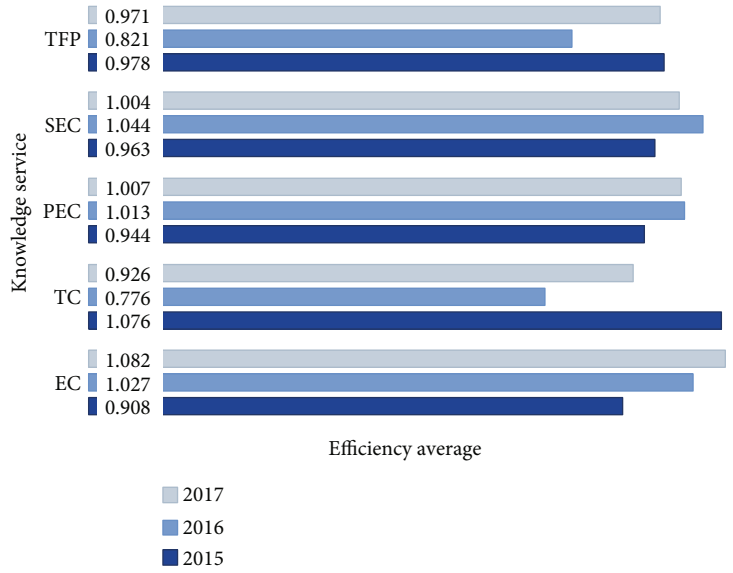

Figure 7: Average changes in the efficiency of knowledge services in academic libraries.

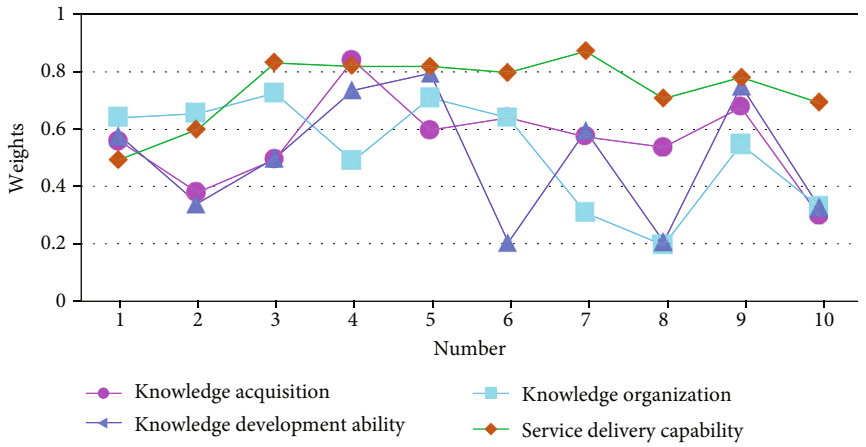

Figure 8: Target level reliability and validity analysis.

colleges and the deepening of readers' demand for knowledge and information, higher vocational libraries will surely be given new forms and functions. Using computer technology to improve the quality of library services to readers has become the goal of the library's efforts. The application of data mining technology in library management system has very important significance. It can well discover the reading interest of teachers and students from the historical borrowing data, and then strengthen the integration and utilization of library resources, and adjust the layout of collections and books to facilitate the borrowing of teachers and students.

Due to the explosion of knowledge and information and the expansion of the Internet and the World Wide Web, the support environment of the library has changed a lot. There are many knowledge carriers in the knowledge resources of libraries. Although paper documents have irreplaceable value in libraries, the development trend of digitization and virtualization of books is still unstoppable. Therefore, the knowledge carrier of the library is developing in a diversified direction. The knowledge carrier of the library can play the functions of preserving human cultural heritage and disseminating knowledge, and the interaction capability of the internal knowledge carrier of the library directly affects the efficiency of the library knowledge network, thereby affecting the role of library knowledge management.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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