Research Article

A Resource Sharing System for Music Education Using the Entropy Technology

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In order to improve the sharing level of music quality and educational resources within the background of emerging digital world, it is essential to design new methods. In this paper, we design a method for music quality education and a resource sharing system within the context of digital world which is established over the entropy technology. The designed structure includes the collection module of music quality education resources, the interactive compilation module of music education resources, the bottom data detection module, the cross bus control module, and the man-machine interface module under the background of digital technology. The information entropy feature extraction technology is adopted to schedule the bus in the process of sharing and transmitting music quality educational resources under the background of digital technology, and the transmission model of music quality education resources is designed. The modular design method of bottom database is adopted to realize the interactive and storage design of music quality education resources under the background of digital technology. Under the background of digital technology, the average mutual information entropy and feature distribution of association rules of music quality education resources are extracted. Furthermore, the method of fuzzy subspace information scheduling is combined with the entropy approach to share and schedule music quality educational resources, so as to comprehend the software development and, therefore, the design of music quality education and resource sharing system under the background of digital knowledge. The simulation outcomes confirm that under the background of digital technology, the music quality education and resource sharing system has good output stability and, therefore, strong human-computer interaction ability.

1. Introduction

Under the background of digital technology, music quality education is an important platform and base to improve national quality and students' sentiment. Music, as a popular form of amateur entertainment, needs more professional guidance and richer information exchange. Universities and society have rich and distinctive musical cultural resources, such as professional teachers, top students of music major, modern music hardware teaching facilities, and project research funds. According to the social group characteristics, a resource sharing system of music quality education under the background of digital technology is established, and resources such as a large number of music lovers, mass music venues, and special funds for music and cultural activities in the society are integrated into music education in schools and institutions of higher education. Therefore,

the sharing and integration of music education resources is by no means a one-way method for academies and institutions of higher education to provide the output and service of education resources for urban and rural communities, but a process of mutual penetration and mutual benefit between the two to accomplish the ideal distribution of education resources [1]. It is of prodigious importance to learn the design method of music quality education and resource sharing system within the context of digital expertise [2].

The establishment of resource sharing systems for music quality education within the context of digital technology is achieved though combining the information fusion and big data mining of the resources of music quality education. Furthermore, we design the resource sharing system of music quality education under the background of digital expertise and improve the capability of integration of the resources of music quality education within the background

of digital expertise [3]. The research on the design method of the resource sharing system of music quality education within the context of digital technology has attracted great attention. This is due to the fact that the design of music quality education and resource supervision structure under the background of digital knowledge is grounded on the diagnosis and treatment design of music quality education resource under the background of digital technology, combined with data fusion scheduling technology, to share music quality education resources under the background of digital technology and to establish the music quality education resource sharing scheme within the context of digital knowledge through network information management design [4].

At present, the exploration of the design method for music quality education resource sharing scheme within the context of digital knowledge is based on the fusion scheduling and information detection of music quality education resources under the background of digital technology, and the fusion and database construction of music quality education resources under the background of digital technology are carried out through fuzzy feature mining. In fact, the multi-sample feature information sampling approach is implemented to build a dynamic big data analysis prototype for music quality education resources under the background of digital technology. Similarly, the sharing of music quality and needed educational possessions within the context of digital technology is realized through fuzzy information fusion. However, the traditional method of sharing music quality education resources under the background of digital technology has poor feature recognition ability and low level of information sharing [5].

Targeting at the above research issues, in this paper we put forward a design method of music quality education resource sharing system under the background of digital technology based on entropy technology. The music quality education resources under the digital technology background should include the acquisition module, the music education resources interactive compilation module, the underlying data detection module, the cross type bus control module, and the human-computer interaction interface module; the information entropy feature extraction technology is adopted to schedule the bus in the process of sharing and transmitting music quality education resources under the background of digital technology; the transmission model of music quality education resources under the background of digital technology is designed; the bottom database modular design method is adopted to design the interaction and storage of music quality education resources under the background of digital technology. To conclude, the simulation test analysis expresses the greater performance of the suggested system which is designed in this paper in humanizing the sharing ability of music quality education resources under the background of digital technology. The major contributions of this work are listed as follows:

(1) The design method of music quality education resource sharing scheme within the context of digital

knowledge which is grounded on the entropy expertise is suggested.

(2) The information entropy feature extraction technology is adopted to schedule the bus in the process of sharing and transmitting music quality education resources under the background of digital technology.

(3) The transmission model of music quality education resources within the background of digital expertise is designed.

(4) The modular design method of bottom database is adopted to realize the interactive and storage design of music quality education resources under the background of digital technology.

The rest of this paper is organized in the subsequent style. In Section 2, the overall design and construction of the system and the database access of music teaching resources are elaborated. In Section 3, digital technology background music quality education resource sharing design is suggested based on the entropy technology. In Section 4, system software implementation and simulation test are discussed and the attained outcomes are deliberated along with figures. To conclude this paper, Section 5 discusses the major outcomes and provides some future ideas that can be considered for further research.

2. General Design and Construction of the Scheme and the Database Access of Music Teaching Resources

2.1. General Design Organization of the Scheme. In order to comprehend and understand the design of the sharing system of music quality education resources under the background of digital technology, the complete and general organization model of the suggested resource sharing system for music quality education and resources within the context of digital technology is first constructed [6]. The sharing system of the music quality education resources within the context of digital knowledge predominantly includes database design, sharing scheduling algorithm design and software development design, and so on, and the information collection module of the sharing system of music quality education resources under the background of digital technology is assembled. Then, joined with the modular sleep technique of the underlying database, the kernel control and integrated information scheduling of the music quality education resource sharing system under the background of digital technology are carried out, and the interactive compilation module of the music quality education resource sharing system under the background of digital technology is constructed [7].

The network networking design of the music quality education resource sharing system under the background of digital technology is carried out within the Internet of Things (IoT) surroundings, and the component library, i.e., ADO.NET, is then cast off to cooperate with the music

quality education resource sharing database under the background of digital technology [8]. The information entropy feature extraction technology is adopted to schedule the bus in the process of sharing and transmitting music quality education resources under the background of digital technology, and the complete design framework of the suggested scheme is obtained as displayed in Figure 1.

The LOCAL bus is used as the output bus transmission method of the music quality and education resource sharing system under the background of digital technology. The two columns of the VXI additional bus pins are cast off to incorporate the music quality educational resources under the background of digital technology, and the bottom-level B/S architecture system is used to design the bottom-level modular design of music quality education resource sharing system within the context of digital knowledge and skill. The functional components of the suggested scheme are shown in Figure 2.

According to the functional structure module shown in Figure 2, Zigbee is adopted to collect and integrate information of music quality education resources within the background and context of digital knowledge, and the man-machine interaction strategy of music quality education resources within the context of digital technology is performed over the network communication module, and the man-machine interaction interface module is constructed [9].

2.2. Optimization of Patient Information Database Access and Storage Structure. The B/S technology is used to manage music quality education resources under the background of digital knowledge, and the fuzzy PID control method is implemented to monitor and control the entire process of sharing music quality education resources under the background of digital technology [10]. This should be noted that the big data fusion model and database storage model of music quality education resources under the background of digital technology are assembled, and the dispersed recognition and clustering of music quality education resources under the background of digital technology are performed through using fuzzy regional information fusion technique [11]. The dynamic matching method is adopted to mine the relevance of music quality education resources, and the feature matching model of music quality education resources under the background of digital technology is constructed. The fuzzy correlation feature quantity of music quality education resource sharing under the background of digital technology is obtained as

$$r_k(1) = 0, v = 1, v(1) = 0, p \in P, v = 1, \quad (1)$$

where P represents autocorrelation characteristic quantity and v represents correlation coefficient, which gives the flow matrix of music quality education resources under the background of digital technology. Under a certain period of sampling, the fusion scheduling of music quality education resources under the background of digital technology is carried out, and the fuzzy membership function of music quality education resources under the background of digital technology is extracted by using the big data information

fusion method, so as to obtain the feature detection model of music quality education resources under the background of digital technology, and the fuzzy iterative formula is as follows:

$$F_k(v+1) = \sum_{x \in X} \frac{DU(v)j}{K(K+U(v))}, \quad (2)$$

where K represents the distribution entropy of music quality education resources and D represents mutual information. Furthermore, $U(v)$ is the statistical characteristic quantity of music quality education resources, and j is the fuzziness of music quality education resources. According to the linear programming parameter distribution model, dynamic optimization is carried out, and the music quality education resource sharing and fusion clustering is carried out under the background of digital technology, and the detection model of music quality education resources under the background of digital technology is obtained, and the characteristic distribution of association rules of music quality education resources fusion under the background of digital technology satisfies the constraint in the following equation:

$$V_k = \sum_{p \in P} v(v+1)i_{jx}, \quad (3)$$

where v is the multi-dimensional information entropy of music quality education resources and i_{jx} is the subspace scheduling set. Combining with multi-dimensional information distribution, the dynamic distribution function of music quality education resources under digital technology background is constructed, and the characteristic function $f(X)$ of music quality education resource detection under digital technology background under subspace fusion clustering environment is obtained, which meets the following conditions:

$$\|f(X) - f(Y)\| \le N\|X - Y\|, \quad (4)$$

where N is the statistical sample number of music quality education resources and X and Y are the sharing factors of music quality education resources in the ontology fusion feature distribution domain. This should be noted that the optimal solution of the dynamic distribution of music quality education resources under the background of digital technology is obtained. The distribution length of music quality education resources under the background of digital technology is N, and $L_x = a_i$ is converted into $2N + 1$ strings to obtain the clustering center of music quality education resource distribution under the background of digital technology. Based on the underlying data fusion technology, the sharing design of music quality education resources under the background of digital technology is realized [12].

3. Digital Technology Background Music Quality Education Resource Sharing Design

3.1. Integration of Music Quality Education Resources under the Background of Digital Technology. The information
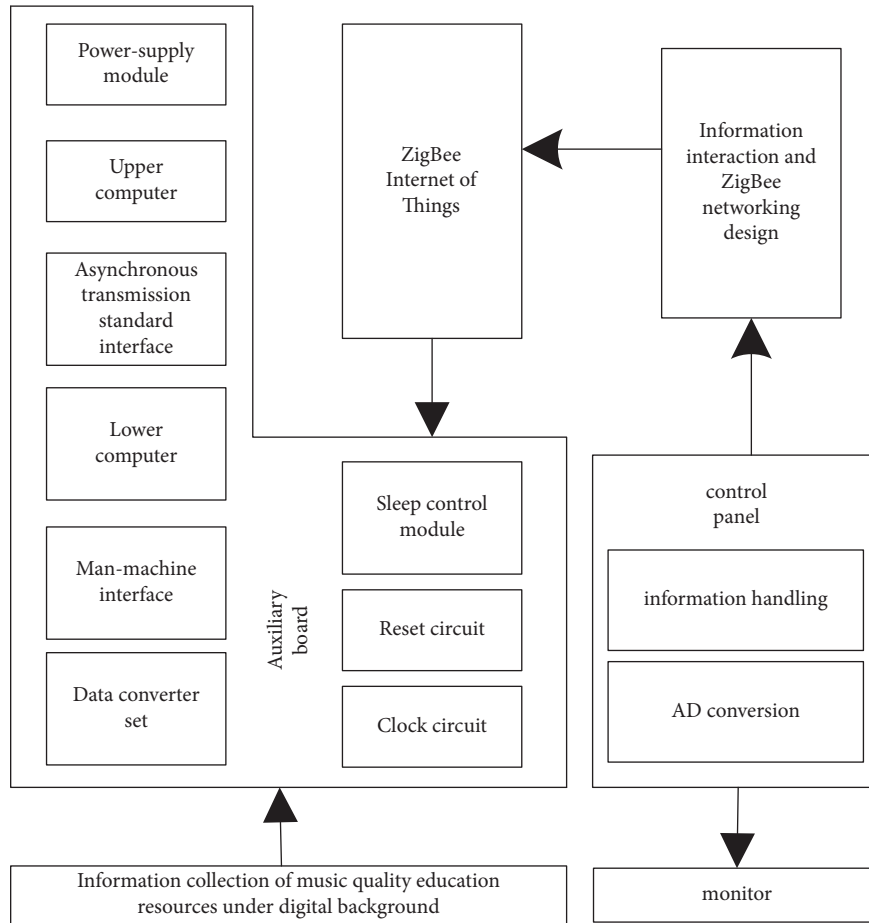
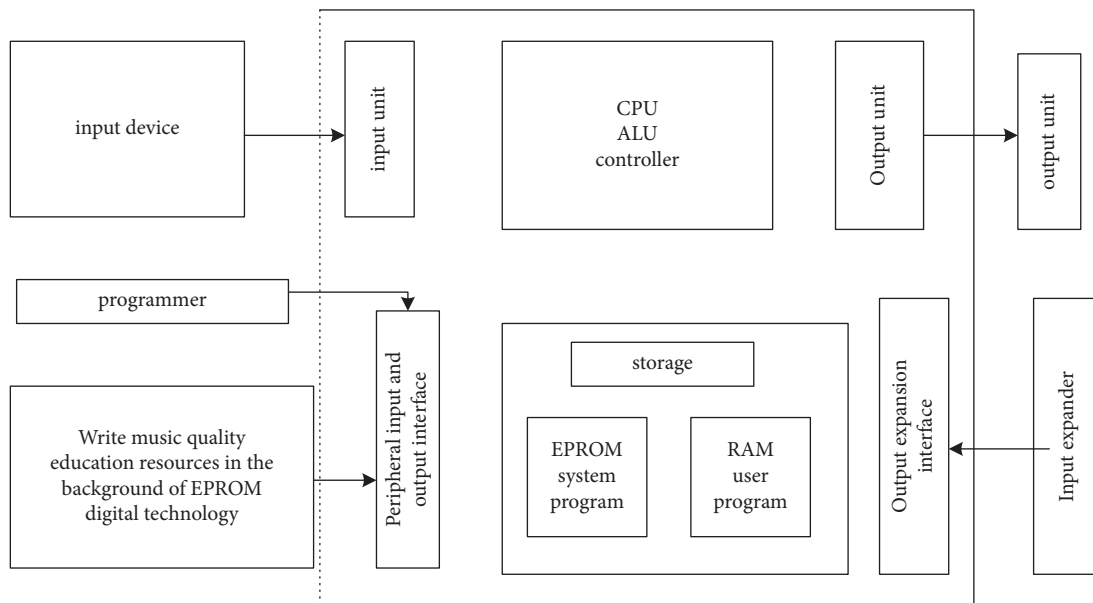FIGURE 1: A complete design framework of the suggested scheme.

FIGURE 2: Structure design of numerous functional components of the suggested scheme.

entropy feature extraction technology is adopted to schedule the bus in the process of sharing and transmitting music quality education resources under the background of digital technology, the transmission model of music quality education resources under the background of digital technology is designed, the dynamic control of music quality education resources management system under the background of digital technology is carried out, and the fuzzy clustering function of music quality education resources under the background of digital technology is obtained as follows(:

$$
\begin{aligned}
v_1 &= \{> a_1, > a_2 \ldots, > a_{i-1}\}, \\
v_2 &= \{\geq a_1, \geq a_2 \ldots, \geq a_i\}, \\
v_3 &= \{< a_{i+1}, < a_{i+2} \ldots, < a_N\}, \\
v_4 &= \{\leq a_i, \leq a_{i+1} \ldots, \leq a_N\}, \\
v_5 &= \{= a_i\},
\end{aligned}
\tag{5}
$$

where $a_1, a_2 \ldots, a_{i-1}$, respectively, represent the fuzzy clustering parameters of music quality education resources under the background of digital technology. Grounded on the aforementioned exploration, the optimization mining and feature reconstruction of the music quality education resources under the background of digital technology are carried out, the fuzzy information entropy of music quality education resources under the background of digital technology is extracted, and the music quality education resources are scheduled under the background of digital technology. The binary feature planning model of music quality education resources integration under the background of digital technology is obtained as follows:

$$
x(k) = \begin{cases} n(k), & H_0, \\ hs(k) + n(k), & H_1, \end{cases}
\tag{6}
$$

where h is the fusion function of music quality education resources under the background of digital technology, $n(k)$ is the interference factor of music quality education resource fusion under the background of digital technology, $s(k)$ is the joint spectral density of music quality education resources, and H_0 and H_1 are the assumptions of music quality education resources, respectively. The heterogeneous storage model of music quality education resources under the background of digital technology is constructed [13], and the dynamic characteristic quantity of music quality education resources under the background of digital technology is extracted, and the fusion degree function of music quality education resources under the background of digital technology is obtained using the following equation:

$$
R_\beta X = U \left\{ \frac{E \in U}{R} \,|\, c(E, X) \leq \beta \right\},
\tag{7}
$$

where $\cdot$ is the fusion operation of music quality education resources on X, the convolution operation of music quality education resources are Y, $c(E, X)$ is the sharing reliability distribution set of music quality education resources, β is the classification feature set of music quality education resources, R is the intermediate scheduling coefficient of music

quality education resources sharing, and R is a real function. Combined with the detection and statistical analysis method, the block detection of music quality education resources under the background of digital technology is carried out, and the data blocks of patient information interaction in large public hospitals and $m_{i,j} (1 \leq i \leq n, 1 \leq j \leq k)$ of music quality education resources under the background of digital technology are obtained. The feature mapping $\Phi: X \longrightarrow Y$ of music quality education resource sharing under the background of digital technology is obtained by using the fusion vector machine learning method, as given in the following equation:

$$
\Phi(x \cdot y) = \Phi(x) \circ \Phi(y),
\tag{8}
$$

where $\Phi(x), \Phi(y)$ means to map the information entropy of music quality education resources. Using information entropy feature extraction technology, the dynamic security detection of music quality education resource management system under the background of digital technology is carried out, and the similarity feature quantity of music quality education resources under the background of digital technology is obtained as follows:

$$
\begin{aligned}
\dot{x}_i &= f_i(x_i, u_i) D(x_i, A_j(L)) \\
&= \min \{ D(x_i, A_j(L)) \},
\end{aligned}
\tag{9}
$$

where $x_i \in R^n$ represents the state vector of music quality education resources under the background of digital technology, $u_i \in R^m$, $f_i(x_i, u_i)$ are joint probability density functions, and $A_j(L)$ is the characteristic solution of closed frequent term. The incremental fusion filtering is carried out on music quality education resources under the background of digital technology in times field, and the fuzzy characteristic distribution set of music quality education resources under the background of digital technology is obtained as m. Let $A_j(L)$ be the cluster center of music quality education resources under the background of digital technology, in which $j = 1, 2, \ldots, k$, in r different cluster centers, gets the dynamic characteristic detection output of music quality education resources under the background of digital technology as follows:

$$
u = Me + Ne,
\tag{10}
$$

where $M \in R^{3 \times 3}$ is the ambiguity matrix; N is the inertia constant of the distribution of music quality education resources under the background of digital technology; $e = X - Y$ is the sharing level of music quality education resources under the background of digital technology; and SD is expressed as differential error, including the mathematical illustration given in the following equation:

$$
\begin{aligned}
\dot{e} &= \dot{X} - \dot{Y} \\
&= Ae + B[f(X)] - f(Y) - u],
\end{aligned}
\tag{11}
$$

where A and B are empirical mode amplitudes, $f(X)$ and $f(Y)$ are similarity distribution functions of resource

sharing, and u is distribution characteristic quantity of deep knowledge perception. Through the above design, information fusion and similarity detection are used to design the resource management and sharing of music quality education under the background of digital technology [14].

3.2. Digital Technology Background Music Quality Education Resource Sharing Scheduling. The method of fuzzy subspace information scheduling is used to share and schedule the resources of music quality education under the background of digital technology [15, 16]. The average mutual information entropy and the feature distribution set of association rules of music quality education resources under the background of digital technology are extracted, and the grouping detection of music quality education resources under the background of digital technology is carried out by using the feature matching, block fuzzy, fusion, and clustering method [17]. In fact, the expression of dynamic distribution feature quantity of music quality education resources under the background of digital technology is obtained as follows:

$$K(x_i, x_j) = \exp\left(\frac{\|x_i - x_j\|^2}{2\sigma^2}\right), \tag{12}$$

where x_i and x_j, respectively, represent the quantitative feature sets of resource distribution in different degrees and σ represents the knowledge map enhancement parameters of music resources. Based on the method of cluster head node fusion, the grouping detection and information fusion of music quality education resources under the background of digital technology are carried out, and the adaptive weighting coefficient is obtained as follows:

$$w_{ji}(k+1) = w_{ji}(k) - \alpha \frac{\partial F}{\partial w_{ji}}, \tag{13}$$

where $w_{ji}(k)$ is the weighting coefficient of music quality education resources grouping, F is the Laplace noise term, and α is the reliability fusion clustering weighting coefficient of music quality education resources grouping, and the fuzzy correlation feature quantity of music quality education resources under the background of digital technology is mined. When there are no abnormal features of music quality education resources under the background of digital technology, $\widehat{R}_{rj}(\mathbf{T}_{rj}^0) \leq \overline{R}_{ir}(\mathbf{W}_i^0)$, and there are no $P_i' < P_i$ and $P_j' = P_j$, the multi-resolution feature solution of music quality education resources under the background of digital technology and convergence conditions are met, and the fuzzy iterative function of dynamic detection of music quality education resources under the background of digital technology is obtained as follows:

$$\dot{x}(t) = Ax(t) + Bx(t - d_1(t) - d_2(t)), \tag{14}$$

where $x(t) = \phi(t), t \in [-h, 0]$, and $\{\mathbf{W}_i', \mathbf{W}_j'\}$ is the binary ontology feature distribution of music quality education resources under the background of digital technology and

obtains the feature solution of music quality education resource sharing under the background of digital technology satisfying $R^{mac}(\mathbf{W}_1', \mathbf{W}_2') = R^{bc}(\mathbf{T}_{r1}^0, \mathbf{T}_{r2}^0)$ and $\overline{R}_{jr}(\mathbf{W}_j') \geq \widehat{R}_{ri}(\mathbf{T}_{ri}^0)$ in the data non-stationary distribution set. Using spatial cluster analysis method, on this technology, the average mutual information entropy and association rule feature distribution set of music quality education resources under the background of digital technology are extracted, and the music quality education resource distribution and allocation under the background of digital technology are performed through the fuzzy subspace information scheduling method, as given mathematically in (15), so as to obtain the distribution of music quality education resources under the background of digital technology [18].

$$\beta_i^c = -\sum_{k \in S_s} R_{ik} Q_{kc} - R_{i1} y_c, \tag{15}$$

where R_{ik} is the resource distribution scheduling parameter on dataset D, Q_{kc} is the sharing factor of music quality education resources, R_{i1} is the representation vector, and y_c is the degree of user's interest in music education resources [19]. To sum up, to realize music quality education resource sharing under the background of digital technology, the algorithm realization flow is shown in Figure 3.

4. System Software Implementation and Simulation Test

The MICRO DSP intelligent signal processor is used to realize VCC detection of music quality education resources under the background of digital technology, CC2530 is connected to the OUT port to control the IO output of music quality education resources under the background of digital technology, and PCI9054 LOCAL bus is selected as the output bus transmission mode of music quality education resource sharing system under the background of digital technology. Sampling of music quality education resources under the background of digital technology is realized under the fusion of entropy functions, and the system software is designed under the B/S framework system [20–22]. The system includes music quality education resource collection module, music education resource interactive compilation module, bottom data detection module, cross bus control module, and man-machine interface module under the background of digital technology. The system software realization structure diagram is shown in Figure 4.

Under the background of digital technology, the sample length of the music quality education resources is 1024, and the training set of music quality education resource distribution under the background of digital technology is 300. The obtained resource information data sample is shown in Figure 5.

The characteristic clustering output of music quality education resources under the background of digital technology is shown in Figure 6.

According to the analysis of Figure 6, the characteristics of sharing and scheduling of music quality education resources with this method are clustered well under the
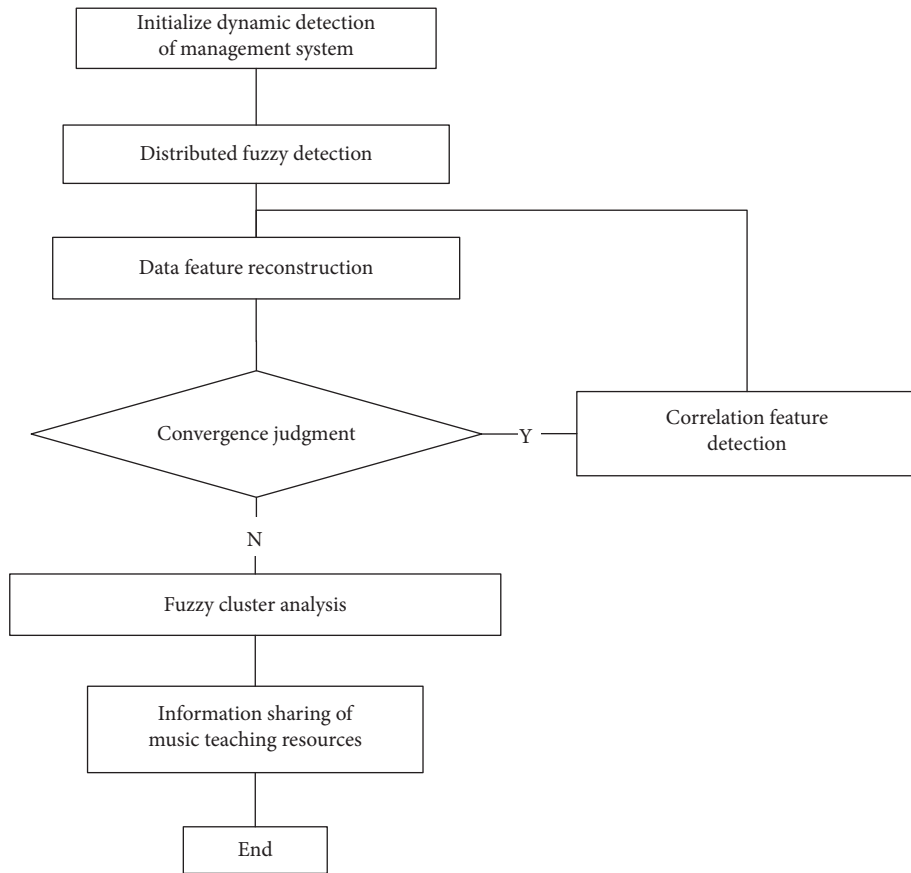
Figure 3: Realization process of music quality education resource sharing under the background of digital technology.
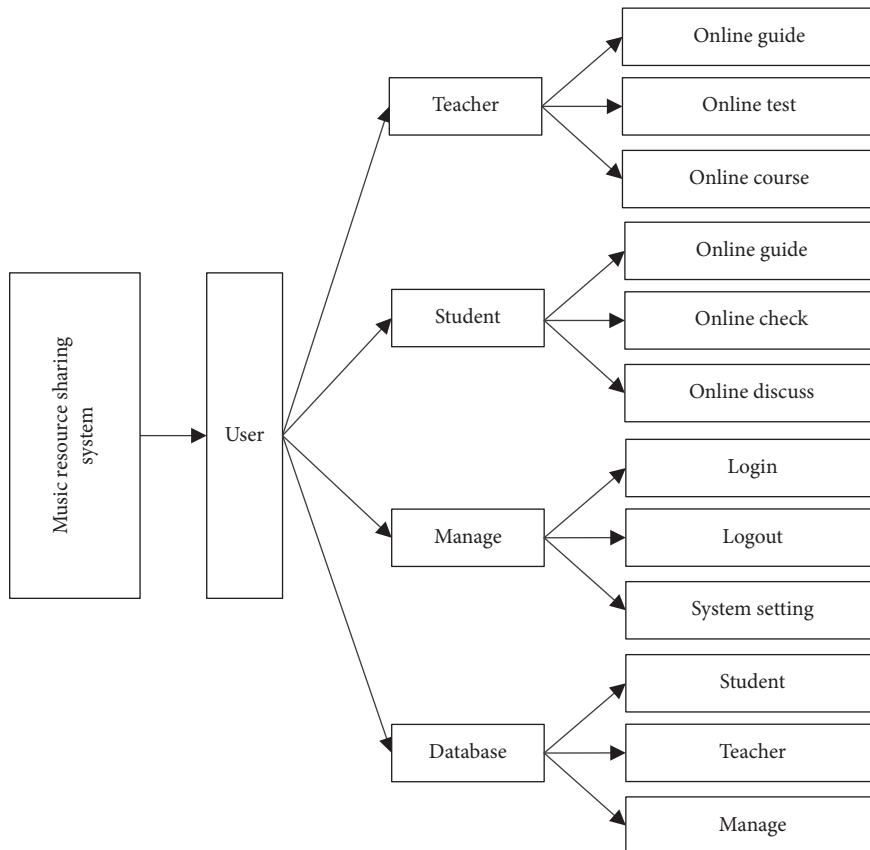

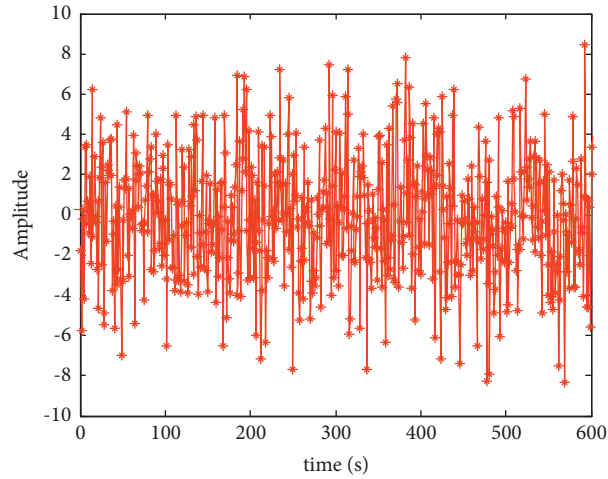Figure 4: The system software implementation structure diagram.

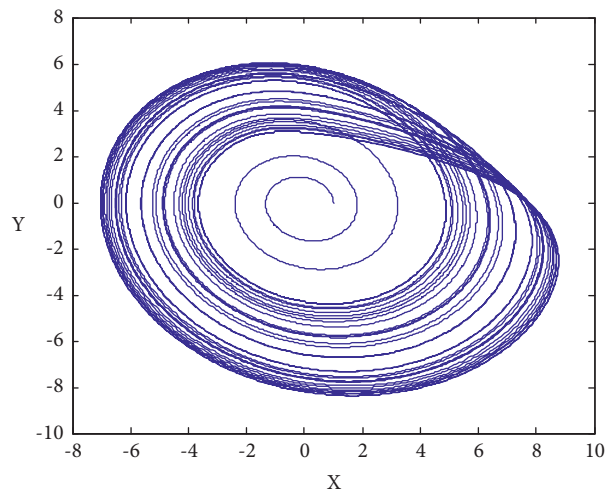FIGURE 5: Data sample of music quality education resources.

FIGURE 6: Characteristic clustering output of music quality education resources under the background of digital technology.

This method
FCM method in reference [4]
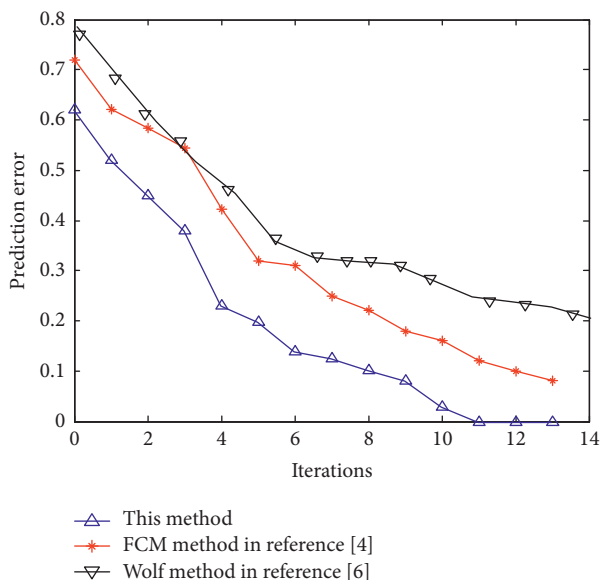Wolf method in reference [6]

FIGURE 7: The convergence curve test.

background of digital technology [23, 24]. Test the convergence of music quality education resource sharing under the background of digital technology, and get the convergence curve as shown in Figure 7.

From the analysis of Figure 7, it can be seen that the convergence of music quality education resource sharing is better, the output stability of information sharing system is better, and the human-computer interaction ability is stronger.

5. Conclusions and Further Research

In this paper, the resource scheme of music quality education under the background of digital technology is constructed, and the information fusion and big data mining of music quality education resources within the context of digital technology are combined to design the resource sharing system of music quality education within the context of digital technology, so as to improve the diagnosis and treatment level of large public hospitals. In this paper, we make known the design method of the resource sharing

system of music quality education within the context of digital tools that are grounded on the entropy knowledge. In the Internet of Things (IoT) environment, the network design of music quality education resource sharing system under the background of digital knowledge is carried out. The B/S expertise is used to manage music quality education resources under the background of digital technology. Combined with fuzzy PID control method, the process control of music quality education resource sharing under the background of digital technology is carried out, and the characteristic matching model of music quality education resources under the background of digital knowledge is constructed to comprehend and understand the allocation of music quality educational possessions under the background of digital technology. The analysis illustrates that the designed scheme has decent man-machine interaction and strong convergence, which improves the level of music quality education resource sharing under the background of digital technology.

In the future, we will account for some real dataset and will investigate further how the suggested model can be applied into a real-world application. Similarly, we will optimize the training phase to train the model quickly and reduce the prediction time. Furthermore, deep learning methods such as LSTM and RNN can also be used to enhance the performance of the model. In fact, the emerging technologies like cloud, big data, and edge computing can also be utilized to optimize the suggested model. We will investigate the prediction outcomes more deeply while accounting for evaluation metrics like precision, recall, and RMSE with respect to other approaches.

Data Availability

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

Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

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