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Research Article

Innovative Development of Intangible Culture of Arts and Crafts in Artificial Intelligence Decision Support System

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The Chinese nation has accumulated a lot of precious, rich, and wonderful material and intangible culture in its historical evolution, but these cultures are facing the problem of inheritance difficulties in the long term, and it is becoming more and more difficult to innovate. In order to solve these problems, this paper puts forward the innovative development of the intangible culture of arts and crafts based on artificial intelligence decision support system, with the purpose of studying cultural inheritance, regional brand hematopoiesis promotion, and organizational goal's support for intangible culture. The method of this paper is to study the basic principles of artificial bee colony algorithms and decision support systems, and then evaluate the value of intangible culture. The purpose of this paper is to analyze the development of local intangible culture and innovation models based on local knowledge systems and confirm the influence of technological innovation on intangible culture so as to promote the sustainable development of intangible culture. This paper describes the present situation of intangible cultural innovation and then explores the innovative ways of intangible culture based on the experiment of cultural development of artificial intelligence. The experimental results show that after using the decision support method mentioned in this paper, the technical progress index of Jingdezhen porcelain culture has increased by 2.4%.

1. Introduction

An intangible culture is a cultural gene that represents the diversity of traditional culture with the national characteristics of a country. However, due to the rapid development of China's modernization process and the accelerating integration of urban and rural areas, the living environment of intangible culture is facing a serious threat. In order to know the audience recognition of intangible cultural digital media communication modes, clarify the role of artificial intelligence decision support systems in the communication of intangible culture, improve the efficiency of communication development, and strengthen the digital media construction of intangible culture, this paper studies the identification index system of the intangible cultural innovation mode. With the acceleration of modernization, traditional culture is gradually marginalized, and people are exposed to a large number of cultural collisions and formalism learning. Young people have learned nontraditional knowledge and non-native culture, such as the attitude of receiving people and things, the way of thinking and values, the world outlook and outlook on life, etc. Modern knowledge is constantly revised or iterated.

In this study, the identity of the decision support system of intangible culture is taken as the starting point, and the theories and methods of communication and public management are used to discuss the problems of intangible culture, which is not only an attempt to provide a multidisciplinary comprehensive study for the research of intangible culture but also an expectation to provide a perspective and methodological reference for this kind of research. Through the application of the index system, this paper can provide index conditions for relevant units to spread intangible culture and provide suggestions for future development so as to better promote the sustainable development of intangible culture. In this paper, cultural

digital transplantation and augmented reality cultural digital transplantation systems based on augmented reality technology are used to design and construct the theoretical framework of an intangible cultural development model, to ensure the development and implementation of artificial intelligence technology in the field of intangible culture, and to promote the practical application innovation of cultural products such as cultural creative products, animation products, and cultural tourism products. The experimental results of this paper are conducive to promoting the synergy and common development of cultural and creative industries and animation industries and realizing the innovative mode of interactive development of cultural and scientific integration.

This paper explores the cultural connotation of national characteristics, realizes the effective interpretation, display, and dissemination of intangible culture, and makes rational development and utilization of intangible culture. This paper is an important part of intangible cultural heritage protection practice. In this paper, the artificial intelligence culture is digitized into the system prototype, taking technology as the core, combining computer graphics with the latest technologies such as images, multimedia, digital animation, network communication, and cloud storage service system. This paper embeds the cultural digital content in the material media carrier, realizes the culture of virtual and real integration on the platform or mobile phone, and provides the digital interpretation of the content of smart devices, digital displays, digital communication, and other cultural experiences, which is an innovative practical operation solution to realize the practical application and development of specific projects [1].

2. Related Work

With the development of artificial intelligence, more and more scholars have studied it to explore the relationship between this technology and intangible culture. Lu developed an underwater camera using artificial intelligence technology, which is widely used to observe the seabed. Users can place them in autonomous underwater vehicles and in-situ ocean sensor networks [2]. Hasabisd et al. think that neuroscience and artificial intelligence have a lot in common. He believes that a better understanding of the biological brain could play a vital role in building intelligent machines. He investigated the historical interaction between AI and neuroscience, and emphasized the common theme that is crucial for advancing research in these two fields [3]. Samuel et al. considered 13 commonly used attributes of heart failure, and experienced cardiologists determined their contributions. He also proposed a decision support system based on an artificial neural network and used a fuzzy analytic hierarchy process to calculate the global weight of attributes according to their individual contributions [4]. Hassan and Subasi introduced a method of using EEG signals to evaluate the sleep stage. He thinks that the decision support system for automatically detecting sleep stage can reduce the burden of manually annotating a large amount of data for medical professionals and calculate the best selection of bagging and TQWT parameters [5]. Focusing on the optimal resource allocation under given requirements, Jin derived the representative model of the system so as to be able to make accurate and reliable decisions. He studied the complexity of identification and its relationship with decision-making and studied dynamic resource allocation. He developed corresponding algorithms and established their convergence characteristics [6]. Kogiso studied the process of the spread of Pelota Mixteca (a traditional activity in Oaxaca, Mexico) to the United States, and focused on the specific cultural aspects of displaying traditional and local sports as an intangible cultural heritage. Now, these tournaments have become a symbol of the spread of Pelota Mixteca culture to the United States [7]. Ubertazzi believes that the misappropriation of intangible culture mainly occurs in countries other than its country of origin, so the misappropriation of culture is transnational. He put forward the innovation theory of intangible culture to avoid these misappropriation phenomena [8].

3. Establishment Method of Artificial Intelligence Decision Support System

3.1. Basic Principle of Artificial Bee Colony Algorithm. In the artificial bee colony algorithm, the exploration process refers to the ability to search for the global optimal solution within the solution space of various optimization problems, while the mining process refers to finding a better solution based on the existing solution. The two processes of exploration and mining are contradictory, and it is difficult to find a balance point [9]. The artificial bee colony algorithm has been proven to be a very effective global optimization algorithm, which is not only easy to understand and implement but also requires less computation. However, the artificial bee colony algorithm still has some shortcomings, such as slow convergence speed and easy to fall into a local optimal solution. In addition, the artificial bee colony algorithm is good at exploration but not mining.

In order to improve the performance of the artificial bee colony algorithm, this section proposes an improved artificial bee colony algorithm. In the improved artificial bee colony algorithm, three completely new variables (current optimal solution, inertia weight, and acceleration coefficient) are introduced into the original artificial bee colony algorithm [10]. In addition, in order to better balance the exploration and mining capacity, the modified formulas of hired bees and wait-and-see bees are different, which is mainly reflected in the second acceleration coefficient. The revised formula for hired bees and wait-and-see bees is

$$V_{ij} = x_{ij}w_{ij} + 2(\theta - 0.5)\left(x_{ij} - x_{kj}\right)\varnothing_1 + \theta\left(\widehat{x}_j - x_{kj}\right)\varnothing_2, \tag{1}$$

where w_{ij} represents the inertia weight, which can control the influence degree of the original food source x_i on the new food source V_i and $\widehat{x}_j$ represents the j-th element of the current optimal solution. $\varnothing_1, \varnothing_2$ represents a positive parameter, which can control the maximum step of the variation, and θ represents a random number between 0 and 1.

In order to adjust them with the change of fitness so as to improve the convergence speed of the algorithm. They are defined as

$$w_{ij} = \varnothing_1 = \frac{1}{(1 + \exp(-\text{fit}(i))/p)^{\text{it}}}, \tag{2}$$

$$\varnothing_2 = \begin{cases} \dfrac{1}{\left(1 + \exp\ (-\text{fit}(i)/p)^{\text{it}}\right)}, \end{cases} \tag{3}$$

where p represents the fitness value of the first food source in the first iteration, and er represents the current iteration times. The pseudocode of the improved artificial bee colony algorithm is simply described as follows:

$$\begin{aligned} V_{\text{ij}}^1 &= x_{\text{ij}} w_{\text{ij}} + 2\left(\varnothing_{\text{ij}}^1 - 0.5\right)\left(x_{\text{ij}} - x_{\text{kj}}\right)\varnothing_1 + \theta_{\text{ij}}^1\left(y_j - x_{\text{kj}}\right)\varnothing_2, \\ V_{\text{ij}}^2 &= x_{\text{ij}} + 2\left(\varnothing_{ij}^2 - 0.5\right)\left(x_{ij} - x_{kj}\right)\varnothing_1 + \theta_{\text{ij}}^2\left(y_j - x_{\text{kj}}\right), \\ V_{\text{ij}}^3 &= x_{\text{ij}} + \varnothing_{ij}^3\left(x_{ij} - x_{kj}\right), \\ V_{\text{ij}} &= \begin{cases} V_{\text{ij}}^1 \ \text{iffit}\left(V_i^1\right) \geq \max\left\{\text{fit}\left(V_i^2\right), \text{fit}\left(V_i^3\right)\right\} \\ V_{\text{ij}}^2 \ \text{elseiffit}\left(V_i^2\right) \geq \text{fit}\left(V_i^3\right) \\ V_{\text{ij}}^3 \ \text{others} \end{cases}, \end{aligned} \tag{4}$$

where x_{ij}, V_{ij} represents the j-th element representing food source x_i and candidate food source V_i, respectively. $\varnothing_1, \varnothing_2$ represents a positive parameter, which is defined as (2) and (3), $\varnothing, \theta$ represents a random number between 0 and 1, and w_{ij} represents inertia weight, which is defined as (2). y_j represents the j-th element of the current optimal solution [11, 12]. The performance of four bee colony algorithms is compared, and Figure 1 is obtained.

It can be seen from the figure that the PS-ABC algorithm, like the I-ABC algorithm, can find the theoretical optimal values of five benchmark functions in different dimensions under the preset parameter conditions, among which the benchmark function f4 with dimension 50 does not reach the theoretical optimal value. Because the modeling process takes a long time, each experiment is repeated 10 times to test the repeatability and stability of the model [13]. The running result data of the three combination modeling are shown in Table 1.

It can be seen from the table that the combination model ABC-ELM has the best prediction effect on training samples, followed by the LSFLN-ANFIS model and the ABC-FLN model. The prediction effect of these three models is better than that of the previous LSFLN model and the optimized FLN model, and they can all predict the algorithm efficiency of training samples with very high precision, which shows that this kind of combined model has good nonlinear identification ability [14]. For the test samples, the three combined models are also superior to the models established earlier. As far as these three models are concerned, ABC-ELM has the strongest generalization ability, but the prediction effect of the model established in a certain run has changed to some extent, but the prediction effect still has high accuracy [15]. Secondly, the ABC-FLN model and the LSFLN-ANFIS model have strong generalization ability and repeatability, and the repeatability is much stronger than the ABC-ELM model, but not as strong as the LSFLN model. The following shows the prediction effects of the three combined models established at one time on training samples and test samples, as shown in Figure 2.

These two pictures can vividly describe the high nonlinear identification ability and generalization ability of the two combination models, but the disadvantage is that these two combination modeling methods need a very long training and learning time.

3.2. Decision Support System. The classification plane generated in high-dimensional space is called a hyperplane. When the data is linearly separable or nearly linearly separable, there are countless hyperplanes that can be selected. The hyperplane that can maximize the separation between two classes is selected as the best classification plane, which is called the maximum separation hyperplane [16, 17]. The defined function interval is expressed as

$$\hat{y}_n = y_n\left(w^T x_n + b\right), \tag{5}$$

where x_n is the feature vector, y_n is the sample label, subscript n indicates that it is the nth sample, and the hyperplane is expressed as $f(x) = w^T x_n + b$ in the form of vector. Then the function interval for all samples is

$$\hat{y} = \min_{i=1,\ldots N} \hat{y}_n. \tag{6}$$

When the parameters (w, b) of the hyperplane change correspondingly at the same time, they can all be expressed as the same hyperplane. In order to unify the specification, this paper limits the parameters so that $|w| = 1$, even if the binormal of w is equal to 1, so the function interval after the specification is called the geometric interval. The geometric interval of hyperplane (w, b) is defined with respect to sample points (x_i, y_i) as follows:

$$y_i = \frac{\hat{y}_i}{w} = y_i \frac{f(x)}{w}. \tag{7}$$

It can be seen from formula (7) that the geometric interval is actually the distance from the sample point (x_i, y_i) to the hyperplane [18]. For the convenience of calculation, let the function interval $\hat{y}_i = 1$, at this time, the objective function for solving the maximum interval hyperplane is

$$\max \frac{1}{\|w\|}, \text{suject to } y_i\left(w^T x_i + b\right) \geq 1, i = 1, \ldots n, \tag{8}$$

where suject represents a constraint condition. In order to have a deeper understanding of the above definition, the data features are defined as 2 dimensions, as shown in Figure 3.

Because it is difficult to solve formula (8) directly, its objective function is transformed into a function that is equally easy to solve and it is represented as

$$\max \frac{1}{2}\|w\|^2, \text{suject to } y_i\left(w^T x_i + b\right) - 1 \geq 0, i = 1, \ldots n. \tag{9}$$

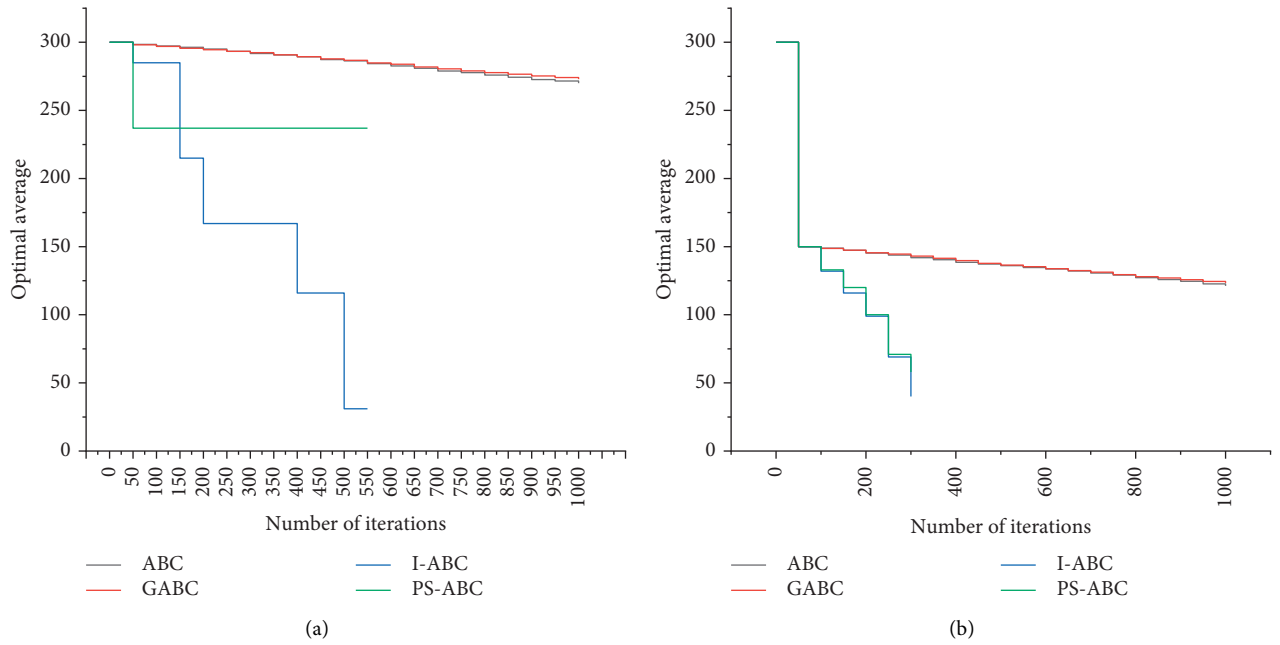

Figure 1: Comparison of optimization performance of four algorithms of unimodal test function: (a) dim = 30 and (b) dim = 50.

Table 1: Simulation results of three combined modeling methods.

Performance	Master model	LSFLN-ANFIS	ABC-ELM	ABC-FLN
Training set RMSE	Min	2.268×10^{3}	2.649×10^{3}	2.205×10^{3}
	Max	2.502×10^{3}	2.536×10^{3}	1.301×10^{3}
	Mean	1.565×10^{3}	2.513×10^{3}	2.544×10^{3}
	S.D.	2.7×10^{5}	1.826×10^{4}	1.473×10^{5}
Test set RMSE	Min	2.526×10^{3}	1.208×10^{3}	1.262×10^{3}
	Max	2.266×10^{3}	2.75×10^{3}	1.716×10^{3}
	Mean	2.183×10^{3}	1.58×10^{3}	1.34×10^{3}
	S.D.	2.947×10^{3}	2.995×10^{3}	2.532×10^{3}
Optimize training time (s)	Mean	25.23	17.8	10.33
	S.D.	11.83	19.11	17.53

Support vector regression machine is transformed from support vector machine theory. Except for the differences in basic definitions, other derivation theories can be shared. The pursuit of the maximum interval hyperplane in support vector machines is to classify the data as correctly as possible, while the output in support vector regression machines can be any real number [19, 20]. The basic idea of a support vector machine is to find a function that can best approach the data sample points to minimize the prediction error [21]. The regression function of the support vector regression machine is expressed as

$$f(x) = wx + b. \tag{10}$$

Assuming that the error between the predicted value and the true value is negligible within the specified parameter E, that is, the loss is 0, the error between the predicted value and the true value can be defined as

$$L_E(d, y) = \begin{cases} |d - y| & -E \text{if } |d - y| \geq E \\ 0 & \text{otherwise} \end{cases}. \tag{11}$$

While pursuing error minimization, we also try to maximize the flatness of the function and reduce the risk of overfitting. At this time, the decision risk error is expressed as follows:

$$r(C) = C\frac{1}{N}\sum_{i=1}^{N} L_E(d, y) + 0.5w^2, \tag{12}$$

wherew^2 represents the flatness of the regression function, and W and B can be solved by minimizing the structural risk. In order to deal with the points that are not within E near the regression function, relaxation variables Q and Q^* are introduced so that the objective function is transformed into

$$\min\left[0.5w^2 + C\sum_{i=1}^{N}(Q + Q^*)\right]. \tag{13}$$

The method of machine learning can be applied to the establishment of a decision support system to provide more scientific guidance for users.

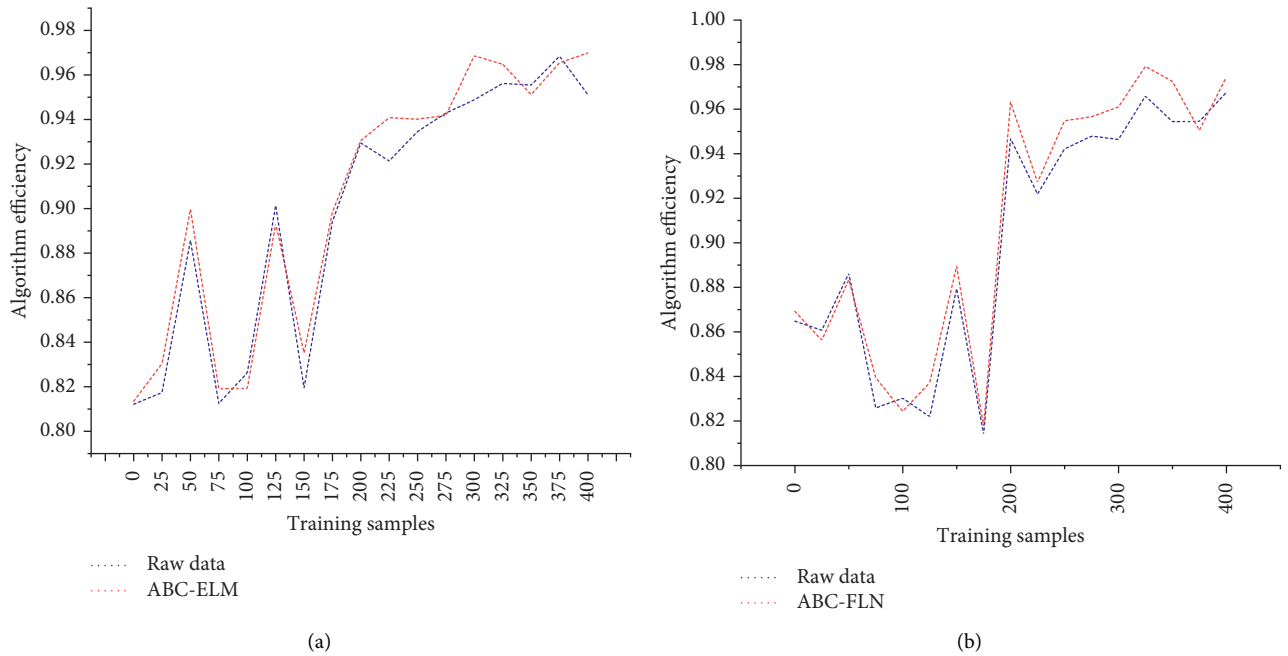

Figure 2: Comparison between the predicted values of training samples and the original measured values by two combined modeling methods.

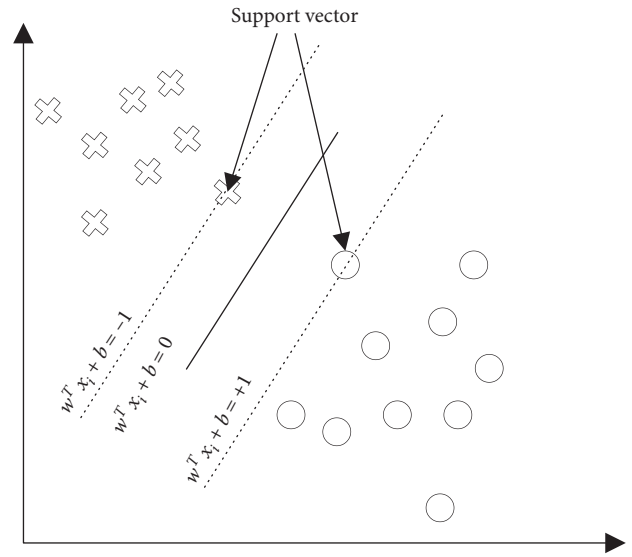

Figure 3: Schematic diagram of support vector machine.

3.3. Intangible Cultural Value Evaluation. The principle of the analytic hierarchy process (AHP) is to arrange various methods according to the conditions and make decisions according to them. The steps of this method are to decompose the problems that need to be decided into several systems that are interrelated at the same time. The factors in the systems can be divided into several layers according to the main conditions. Then, scholars, experts, and other authoritative figures are invited to compare the importance of each factor pairwise, sort each system factor according to the mathematical formula, and finally make a decision analysis according to the sorted results [22].

In this paper, the characteristics of intangible culture are fully considered, the indexes and elements suitable for intangible cultural heritage evaluation are selected, and the evaluation index system is constructed with reference to relevant research systems and experts' opinions. The first-level evaluation layer of this paper includes basic value A, heritage quality status B, development basic conditions C, and development potential D. For the system element Al (cultural value), we determine the importance of all, A12, and A13 in the system. The third-order pairwise judgment matrix of A1 is obtained from the distribution result. The matrix is $A = (a_{ij})n \times n = (a_{ij})3 \times 3$。 According to the

relative weight calculation formula (14), the relative weights of al1, A12, and A13 in the A1 element layer are calculated as 0.32, 0.36, and 0.32, respectively.

$$W_i = \frac{1}{n}\sum_{j=1}^{n}\frac{a_{\mathrm{ij}}}{\sum_{k=1}^{n} a_{\mathrm{kj}}} \ (i = 1, 2 \ldots n). \tag{14}$$

According to the maximum eigenvalue formula (15), the maximum eigenvalue of matrix A is 1.9.

$$\gamma \max \frac{1}{n}\sum_{i=1}^{n}\frac{\sum_{j=1}^{n} a_{kj} w_j}{w_i}. \tag{15}$$

First, the consistency index *C.I.* is calculated. According to the calculation formula (15) of the consistency index, the index number of matrix A is 0.0476.

$$C.I. = \frac{\gamma \max - 1}{n - 1}. \tag{16}$$

Next, according to the *R.I.* comparison table of mean random consistency index, we can see that the *R.I* corresponding to the matrix is 0.518. Finally, according to formula (17) for calculating the consistency ratio, the consistency ratio of the matrix is 0.267.

$$C.R = \frac{C.I.}{R.I}. \tag{17}$$

If *C.R.*<0.1, this paper thinks that the consistency of the judgment matrix is acceptable, so matrix A is acceptable. According to the above steps, the following Table 2 is obtained by inputting data with Yaahp software.

The above table shows that in the evaluation of intangible cultural value, the basic value of resources should be first analyzed in the comprehensive evaluation layer, followed by their quality status [23]. This is because the basic value and quality of resources are the basis and guarantee of intangible cultural development, and it is difficult to attract a large number of appreciators without excellent resources. Summarize these elements to build the hierarchy model diagram of the evaluation index system, as shown in Figure 4.

4. Taking Jiangxi, China as an Example, the Experiment and Analysis of Intangible Culture Innovation

4.1. Status Quo of Intangible Cultural Innovation. According to statistics, there are 18 Chinese folk culture and art towns in Jiangxi Province, which include lanterns, suona, drama, songs and dances, poetry, prints, comics, papercutting, calligraphy, calligraphy, root arts, and other art types. These art towns are also the main cultural sources of 10 kinds of intangible cultural heritage in Jiangxi Province. In terms of the proportion of projects, Jiangxi Province has 1,654 national four-level intangible cultural heritage projects. Observing the stock of each resource in 11 districts and cities, we can find that the total number of intangible cultures in 11 cities is 967 (no horizontal cross). Figure 5 shows the proportion of specific cities in quantity.

To a certain extent, this shows that the quantity of intangible cultural heritage resources in Jiangxi Province is distributed differently in different cities, showing a relative concentration in regional distribution [24]. In this paper, the experiment will select Baidu, Sohu, Yahoo, and Netease, collect 31 intangible cultural heritage websites in Jiangxi Province, and then search for academic research results of intangible culture in HowNet. This paper collects data related to intangible cultural heritage projects on the Internet and gets Figure 6.

Among the 20 items with relatively large search volumes in Jiangxi Province, the average search volume of four search engines for Jingdezhen handmade porcelain is 590,000, Hakka drama is 56,000, and camphor tree traditional Chinese medicine products is 420,000, followed by Nanchang porcelain prints at 320,000, and Ruichang paper cuts at 300,000. Among the nine outstanding cultural projects in China, the average search volume of the four major networks of Peking Opera is 860,000, and the average search volume of the nine projects is 420,000. Among the 32 projects in Jiangxi Province, only Jingdezhen Handmade Porcelain, Gan Opera, and camphor tree traditional Chinese medicine represent the best average Internet search level in the province and the overall network attention of intangible cultural projects in this region. At present, Jingdezhen's handmade porcelain, gunplay, and Yiyang play are listed in the national average academic research achievements of outstanding projects and the overall science of intangible cultural heritage projects.

After the first round of summary analysis of the expert questionnaire, 7 out of 10 experts gave a proportion of 0.4 in the score of cultural heritage value. Five of the cognitive values give a proportion of 0.2. There are 6 artistic aesthetic values with a proportion of 0.1. The economic development value of 6 places gives the proportion of 0.3, as shown in Table 3. According to the determination principle described above, the weight division of the four dimension values is obtained [25].

From 2010 to 2020, the overall situation of the craft ceramics industry is shown in Figure 7 and Table 4.

The total factor productivity index of the Jingdezhen ceramic industry is 1.007, an increase of 3.4%, which is mainly due to the improvement of technical efficiency (an average growth rate of 7.8%) and the change of scale efficiency (an average growth rate of 7.1%), which indicates that the relative scale of production is decreasing, and the technical progress of the Jingdezhen ceramic industry is slowly increasing (about 3.2%). To some extent, the decline in technical progress efficiency counteracts the positive effect of technical efficiency improvement.

4.2. Cultural Development Based on Artificial Intelligence. The development of intangible cultural products in Jiangxi should be based on the endowment of intangible cultural resources and attach great importance to market demand, consumer consumption characteristics, and its changing trend. The demand of consumers is the foundation of designing intangible cultural products. Consumers prefer

Table 2: Weight distribution table of intangible cultural value evaluation index system.

Tier 1 rating	Weights	Secondary evaluation layer	Weights	Three-level evaluation layer	Weights
Basic value A	0.329	Cultural value A1	0.034	Cultural customs A11	0.136
				Religious characteristics A12	0.664
				History and culture A13	0.2
		Aesthetic value A2	0.766	Beauty A21	0.153
				Odd characteristics A22	0.647
				Scale A23	0.2
		Artistic value A3	0.102	Infectivity A31	0.085
		Recreation value A4	0.098	Participation A41	0.115

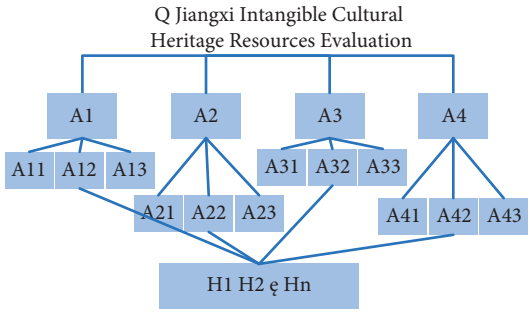

Figure 4: Hierarchical structure model diagram of intangible culture evaluation index system.

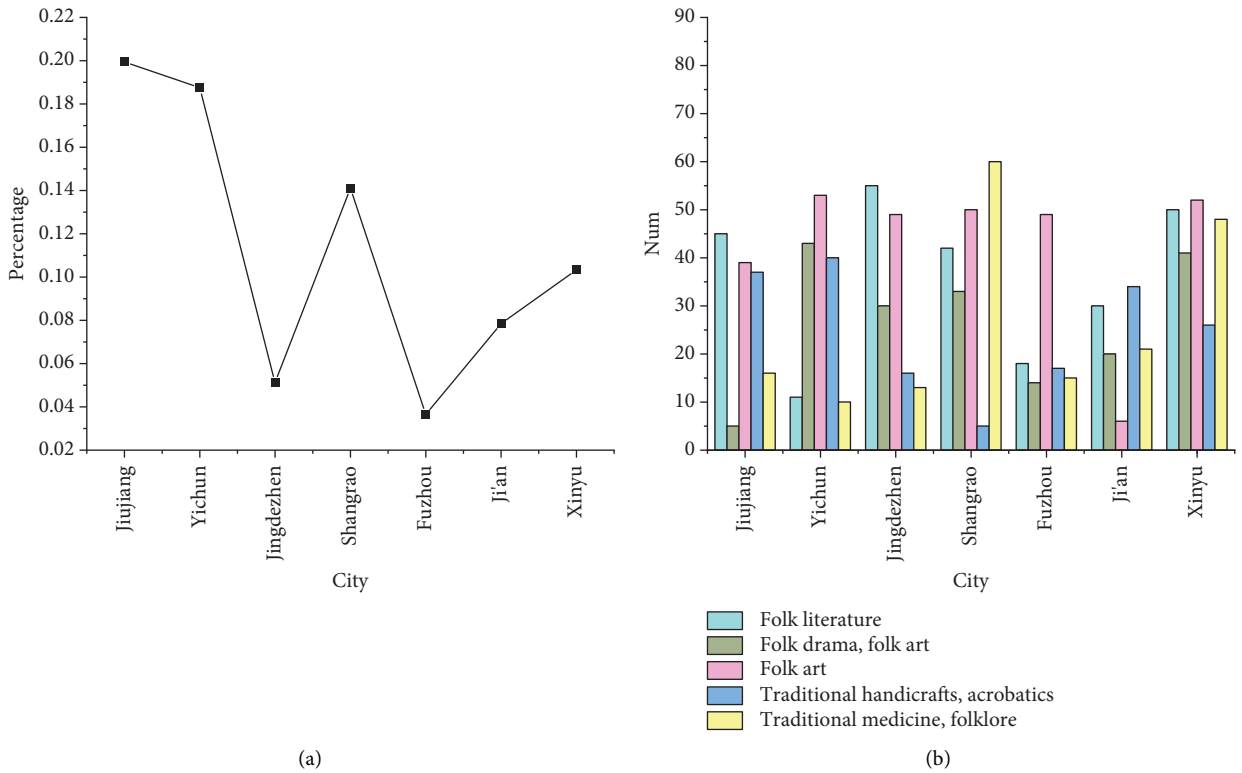

Figure 5: The proportion of nonlegacy in Jiangxi Province by cities.

intangible cultural products with higher participation and a unique experience. At present, most intangible cultural products in Jiangxi belong to festival and sightseeing tourism products. In the process of developing intangible cultural products in the future, we must make clear the market orientation, take the market orientation as a reference, accurately grasp the market orientation of intangible cultural products, and aim for the target. At the same time, we must grasp the market demand according to the analysis of market demand content, saturation status, development

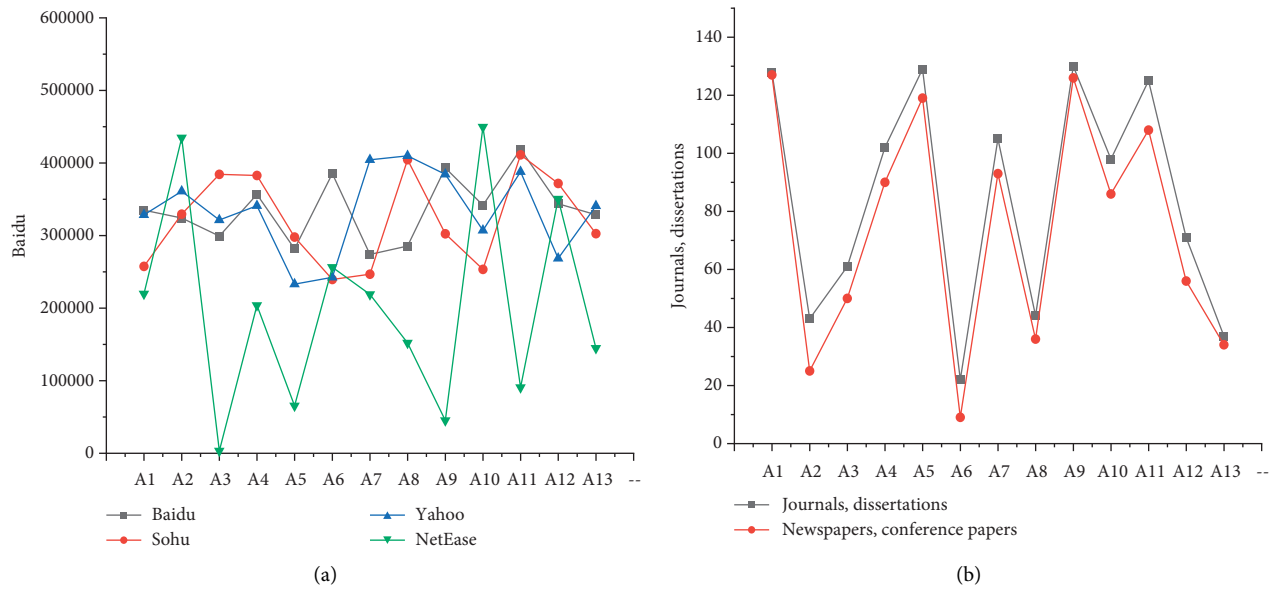

Figure 6: Comparison of search volume between intangible cultural network and HowNet.

Table 3: Summary of four-dimensional value weight expert questionnaire.

Value dimension	1	2	3	4	5	6	7
A1	0.4	**0.2**	0.4	**0.2**	**0.1**	0.3	0.3
A2	0.4	0.5	0.3	**0.1**	**0.2**	**0.2**	**0.1**
A3	**0.1**	**0.1**	0.4	0.3	0.3	**0.2**	**0.1**
A4	0.4	**0.2**	0.4	0.5	0.5	0.5	**0.2**

trend, and other factors so as to design on demand. The government or planning department should constantly innovate the system of intangible cultural products according to the changes in market demand [26].

Jiangxi intangible culture, as an important part of Chinese traditional folk culture, is a resource with general characteristics of intangible cultural heritage such as historical inheritance, sociality, regionalism, and life ecology. On the basis of expounding these basic characteristics, this paper focuses on the analysis of its quasipublic character.

At present, with the government as the mainstay, encouraging social capital to join in, and inviting public bidding for the infrastructure construction project of intangible cultural heritage transmission and exhibition base, the province has built a number of multifunctional infrastructures such as intangible cultural heritage protection bases, ecological protection areas, museums, exhibition halls, special pavilions, and learning centers. For example, the Nanchang International Exhibition Center, located in the central area of Honggutan, Nanchang City, is the largest platform for displaying intangible cultural heritage and cultural exchanges with the outside world in Jiangxi Province. In 2010, there is also a "Nanchang Intangible Cultural Heritage Dynamic Exhibition Hall" in the Shengjin Tower Scenic Area of Nanchang, and there are also Yiyang Opera Protection and Inheritance Base, Fuzhou Intangible Cultural Heritage Protection Key Project, and the Cultural Ecological Protection Experimental Zone, which are included in the national intangible cultural heritage protection pilot project. These infrastructure projects with the theme of intangible cultural heritage are in full swing, boosting the overall protection of intangible culture, and promoting the commercial utilization of intangible cultural heritage appropriately [27].

This paper puts forward a decision support system for the development of intangible culture by applying the related theories of cultural heritage and artificial intelligence technology. The system structure is shown in Figure 8.

In recent years, in order to improve the professional level and skills of intangible cultural heritage workers, representative figures have been selected from the whole province, professional training courses for intangible cultural heritage workers have been held, and representative inheritors of intangible cultural heritage and well-known experts and scholars in related fields in the province and the whole country have been invited to give lectures to students, and classified and graded training has been conducted in the aspects of restoration and protection of endangered intangible cultural heritage, utilization of intangible cultural heritage projects, and industrial development. Encourage all walks of life, especially colleges and universities, to carry out theoretical research, compile and publish works on intangible cultural heritage and publish related papers. Typical examples are the series of books compiled and published by the Lushan Cultural Research Center of Jiujiang University,

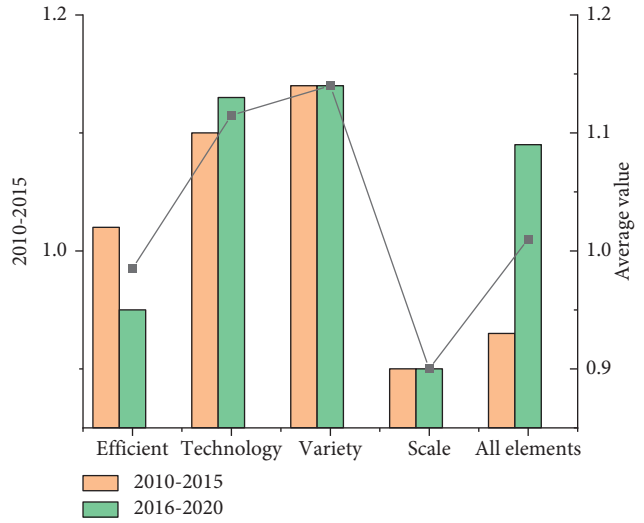

Figure 7: Changes in the efficiency of Jingdezhen handicraft porcelain industry from 2010 to 2020.

Table 4: Average results of total factor productivity in various industrial subjects of Jingdezhen handicraft porcelain.

Industry body	Efficient	Technology	Variety	Scale	All elements	Rank
DMU 1	1.448	0.26	1.046	1.109	1.007	4
DMU 2	1.196	0.28	1.457	1.146	1.483	1
DMU 3	1.123	0.438	1.083	1.452	1.364	2
DMU 4	1.379	0.069	1.076	1.3	1.009	3

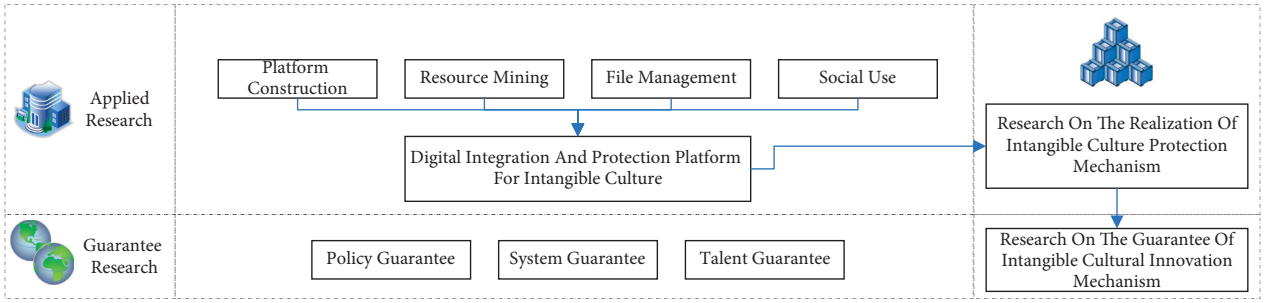

Figure 8: Decision support system based on the combination of culture and technology.

such as Hukou Qingyang Chamber, Ruichang Paper-cut, Wuning Drum Songs, Yunji Poems, and Yi Yijun's Introduction to the Protection of Intangible Cultural Heritage in Jiangxi. These works and papers are of great significance to the intangible cultural heritage of Jiangxi [28].

4.3. Innovative Ways of Intangible Culture. The business model design of regional intangible culture can be attempted from two aspects: sustainability and emotional experience. The former integrates the costs, channels, key businesses, and partners in the business model with sustainable methods through the investigation of local knowledge, resources, culture, and demand. Commercial value can be realized in a low-tech, low-cost, and recyclable way [29]. The latter is to integrate emotional design factors into the fields of the brand story, business scope, customer relationships, partners, etc. in the business model, to make consumption activities more meaningful and promote communication between people at the same time, thus bringing different experiences to users, as shown in Figure 9.

Traditional design is a top-down process for individuals and users, while new design is a bottom-up process for citizens. There is an active interaction between the active public and design professionals. Therefore, cultural innovation designers should first take root in the community, deeply explore the cultural background, the inner relationships and interactions between people, people and villages, and explore local knowledge from the perspective of cultural owners. The second is to strengthen the integration of service objects. Let local residents participate in the design as co-owners and producers of resources, and promote the sustainable progress of social innovation internally. On this basis, this paper will build a network-based cross-border communication, exchange, and cooperation platform, as shown in Figure 10.

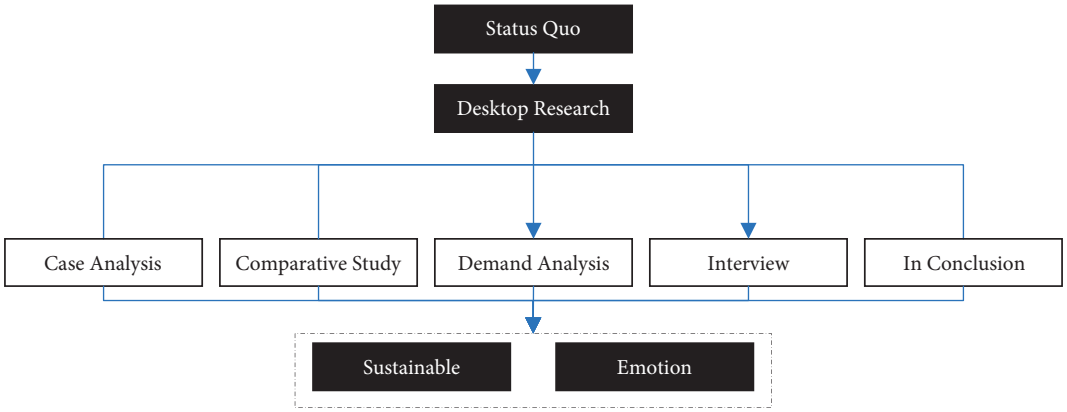

Figure 9: Design method of intangible cultural business model.

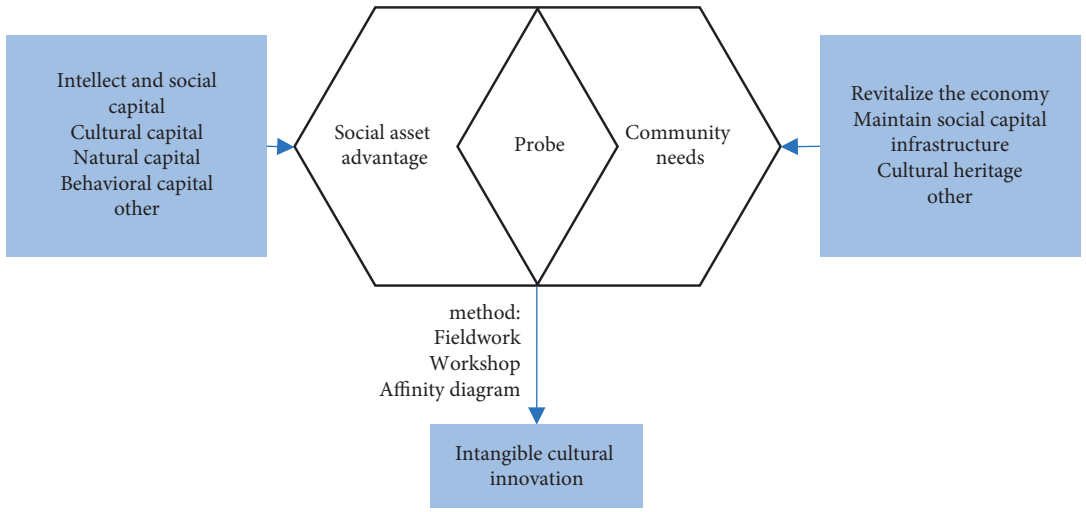

Figure 10: Participation mode of intangible cultural innovation.

The unique geographical and cultural resources in remote areas, as a way to promote cultural diversity and record the existence of human creativity gene pools, meet the diverse needs of people in the postindustrial era. These intangible cultural resources have unique national wisdom and rich emotions, but blind pluralism often leads to excessive national egoism. During the implementation of the project, this paper established an information network platform to inherit the regional characteristic culture and developed the intangible culture into the link between local residents and the outside world in terms of design, talents, capital, and information. This paper fully mobilizes the research enthusiasm of the research object, participates in the research object, identifies with the local culture, new technology, new technology, and the new trend of globalization, and transforms the regional value into global value. In the intangible cultural status quo of the Jingdezhen handicraft porcelain industry mentioned above, the technological progress of this intangible culture has increased by 2.4% after using the decision support method mentioned in this paper.

In China, the development of the intangible cultural industry needs a new breakthrough, that is, the application of innovative artificial intelligence decision support systems. The use of science and technology can help the intangible culture continue. Thus, in the process of the development of regional intangible culture, reasonable innovation mode design can realize cultural sustainability.

5. Discussion

Shortcomings of this study: it takes a certain amount of time and cost to realize artificial intelligence in regional intangible culture. From desktop research, market research, trend analysis, field research, product design, platform construction, and sales promotion, the development cost is high and the cycle is long. In future research, the design methods and processes should be continuously optimized and improved. In this paper, the preservation and dissemination of regional intangible culture and its application practice remain in the production of related products, image packaging design, network public propaganda platform, etc. Based on the rapid development of existing artificial intelligence technology, more diverse ways and means of cultural communication can be explored. The future research direction is to constantly improve the research method of regional intangible culture innovation mode design, apply it to the development

of other intangible cultures, build a digital library of intangible cultural elements, and apply it to the protection practice and development of characteristic cultures so as to make regional culture glow with new value and charm.

6. Conclusions

In this paper, the identification index system of the intangible cultural digital media communication mode is constructed, and the empirical and applied research on the communication mode of China's intangible cultural resources database is carried out. The summary is as follows: this paper takes intangible cultural protection as the basic goal and basic teaching idea, focuses on the current situation of intangible cultural digital protection at home and abroad, and summarizes its benefits and existing problems. Based on the basic principles of intangible culture and artificial intelligence technology, this paper constructs the theoretical framework CDIM of the intangible culture development mode of cultural digital transplantation and the ideology and integrated application of artificial intelligence system that guide the theoretical framework. This paper advocates the use of the basic idea of intangible culture as a technology and designs the prototype ARCDIS of artificial intelligence culture digital implantation system for other modern scientific and technological tools, which are used for the application and development of intangible cultural digital practice. In this paper, the intangible culture in Jiangxi Province is taken as an example to develop and implement an application example, and the corresponding experimental test results are given on the mobile intelligent terminal.

Data Availability

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

Conflicts of Interest

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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