

Research Article

Development and Application of Ceramic Cultural and Creative Products Based on Artificial Intelligence

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Ceramic cultural and creative products are creative products with ceramic cultural characteristics that have been concerned and loved by people since they entered the modern society. Various cultural and creative products represent the efforts of the ancients and the infusion of modern souls, and they have become a very memorable product. However, in the development of such products, it has always been a difficult problem to solve, and there are many difficulties in developing a product. It needs to consider the practicality of the product and must also combine cultural characteristics. It also makes innovative changes. It cannot blindly reproduce cultural relics. It must have its own design concept. Finally, it has to cater to the needs and preferences of consumers. Because there are so many factors to consider, designers spend a lot of energy and time in the process of developing new products. Therefore, in order to help designers get relevant and accurate data faster and more efficiently, we propose a method of artificial intelligence technology. It analyzes the development and application of such products and conducts experimental research on the role of artificial intelligence in product development and application. The results show that the technology is very suitable for product development and application, and it improves the effectiveness of product development and application. The pattern is the feature that can best show the uniqueness of the ceramic process. After using the algorithm in this paper, the extraction level can reach 0.73 and only 0.66 if it is not used. Therefore, in order to make the development and application of such products better, the application of artificial intelligence technology should be emphasized.

1. Introduction

Ceramics have always been a representative of traditional Chinese culture, it represents the wisdom and hard work of our ancient people. In recent years, the design of ceramic cultural and creative products has become a very hot topic. Many artists have spent a lot of thought in this area and are committed to promoting ceramic products. At present, there are quite a lot of ceramic products on the market, and the sales volume is very considerable. Whether it is for collection or personal use, these ceramics are very good choices. The development and application of ceramic cultural and creative products has always been a difficult problem to solve. Cultural and creative products have to meet people's needs, and they must also create benefits and bring nonmaterial services. It is slightly different from pure art ceramic products. Cultural and creative products are more

like a souvenir that everyone can like and have. In addition, novelty and practicality must be considered in cultural and creative products. So even old artists are very troubled by the development and application of these products. Considering the quintessence of ceramics and the fact that it belongs to an era of intelligence, the development and application of this type of product is worthy of research and discussion by scholars.

Due to China's emphasis on traditional culture, more and more scholars have studied the subject of ceramic cultural and creative products. Among them, Rui and Liqun analyzed the application mode of design symbol theory in the development of cultural and creative products [1]. However, the data he used in this paper are very early data and are not novel enough for current research. Later, Wang argued that cultural identification and cultural determination determine how to best apply them to commercial

products, and for this to require the investigation and compilation of large amounts of cultural information [2]. But he did not take into account the possible existence of other influencing factors during the experiment. Li and Zhang studied the development of cultural products as a way to perfectly combine traditional materials with the spiritual needs of the new era [3]. But the theoretical framework he used in this paper is not very complete. Ngo et al. studied the use of the input-output table method and proposed a method to measure the development economy of cultural and creative products [4]. But when he described the relationship between the cultural industry and other economic sectors, he did not express their relationship very comprehensively.

In terms of artificial intelligence, Bin and Kumbier discussed how to summarize public interest through surveys and realize human-machine collaboration in product development and application [5]. But the case studies he lists in the article do not quite fit the theme of the article. Botega and Silva proposed a system using artificial intelligence (AI) to assist designers in knowledge management of designs [6]. But the model he used when designing the system was not very suitable for the system. Liu analyzed the construction of management performance model based on artificial intelligence technology, and he found that artificial intelligence can provide corresponding products according to customers' interests [7]. But he did not first explain the meaning of management performance in the text.

Artificial intelligence technology can be used flexibly in various professional fields, and its research is very technical and professional. It can quickly and correctly learn external data, and use this data to achieve the goals to be achieved. Its capabilities are even comparable to those of humans, and may surpass humans in some respects. This technology is also often used in product design and development applications, and the effect is very good. The innovation of this paper is to use a new method, artificial intelligence technology, to research the development and application of ceramic cultural and creative products. In the research process, a simple and effective method is used to investigate the existing data for detailed analysis, which attempts to prove that artificial intelligence technology and the research object of this paper are a perfect combination. It provides support for future research on similar topics.

2. Methods of Development and Application of Ceramic Cultural and Creative Products

This chapter mainly introduces the development and application methods of ceramic cultural and creative products. It also introduces the use of artificial intelligence algorithms to explore and identify the characteristics and influence of cultural and creative products. Cultural and creative products are currently very optimistic in China, and ceramics are the representative of Chinese tradition. There are a number of things that require special attention in the development of such products. Artificial intelligence technology has the ability to quickly extract and apply big data. These are all good factors that help product development and application,

so it is necessary to conduct method research on ceramic cultural and creative product development and application before drawing conclusions.

2.1. Ceramic Cultural and Creative Products. The history and culture of ceramics is very long. After thousands of years of craftsmanship, the current technology of making ceramics is very mature. In the context of this new era, we should continue to carry forward the ceramic culture [8]. And ceramic cultural and creative products are ceramic products that are innovatively transformed by combining people's actual needs [9]. It is loved by people. According to the latest survey, it can be found that what people value most is whether ceramic products have particularly attractive ideas. As shown in Figure 1, ceramics can also be made into very delicate and lovely dolls. Like the rabbit in the picture, it is life-like, small, and cute. The material looks very different from other materials and looks very transparent. Neither children nor adults can resist its charm. This type of product is also very good as a home decoration. The innovative combination of ceramics and metal is also very good. The cutting of modern craftsmanship and the fire refining of ceramics together create a cross-era spark from ancient times and modern times [10]. This type of new craft design is very popular with today's urbanites. Painting on ceramics is also a new idea. Because it is the trend and retains the traditional charm. Painting landscapes on ceramics makes the whole ceramic product very artistic. The moment seems to place one in a kind of poetry and painting from Chinese literati. And the panda is also a unique symbol of China and is very popular among the people. If the collision of metal and ceramics gives people a modern feeling, then the collision of geometric lines and ceramics gives people a feeling of breaking the stereotype and looking new. The use of geometric lines as ornaments makes these cups simple and atmospheric, as well as mathematically mysterious. All in all, innovation and meeting customer needs are very important for cultural and creative products.

As a result, with the development of technology, there are many innovative ways for such products. Designers can study the characteristics and special elements of each porcelain according to the achievements of the ancients and the different characteristics of each age. And in this process, combined with the needs of consumers, he will develop the artistic imagination of creation, injected his own inspiration into the porcelain, and let it reflect his own design concept and aesthetic point of view. But designers should strictly follow the development process design when creating such products, as shown in Figure 2. When developing a new product, it should first interpret the culture of a certain era required, and then extract the desirable elements. By giving play to the imagination, it endows this product with functions, subdividing new colors, new ideas, and user preferences. It then successfully developed a new product, which was finally marketed on the Internet. And in the process of creation, designers cannot break away from the background of the current era, so that the works have the unique characteristics of this era [11].



FIGURE 1: Ceramic cultural and creative products.

In fact, in the current ceramic product market, we can find that many products are replicas of the elements in the craftsmanship of the past. It is just a replica of the dial, and it does not have any design soul at all. It lacks aesthetic value and cultural heritage. Therefore, in the development of such products, we should deeply understand and explore the characteristics of various aspects of cultural relics, extract visual elements, and representative symbols, add our own understanding and artistic expression, and design products according to current people's needs. The cultural and creative products designed in this way can express artistic features and at the same time be widely welcomed by the public [12]. The method of its element extraction is shown in Figure 3. When extracting, attention should be paid to the user's emotions, that is, the user's interests. We should also focus on functional requirements, and we must determine the purpose of the product and what functions it should have. Then it combines the above two requirements to extract symbols. The products produced in this way can give users a functional user experience on the outside and bring a brand new emotional experience to users on the inside [13].

2.2. Artificial Intelligence Technology. As a technical science, artificial intelligence mainly studies the characteristics and laws contained in human intelligent activities. Based on these characteristic rules, it imitates and constructs artificial systems with a certain degree of intelligence and attempts to let computers use intelligent artificial systems to complete tasks and tasks that previously required human intelligence [14]. In short, artificial intelligence mainly studies how to apply the software and hardware of computers to simulate the basic theories, methods, and technologies of human intelligent behavior and simulate, extend, and expand human intelligence through intelligent algorithms, platforms, or machines. From another point of view, it is more

like an interdisciplinary. As shown in Figure 4, AI brings together almost all disciplines.

It also has many application fields, as shown in Figure 5. A robot (such as PET chatbots) can understand human language. It can use human language to conduct a complete dialogue with humans, and it can use specific sensors to analyze the situation and adjust its actions to achieve the purpose of expression [15]. This aspect of language recognition has always been a unique capability of AI. This field has essentially the same part as robotics, which is designed to convert language and sound into information that can be processed. For example, the intelligent voice assistant that comes with the mobile phone now can help perform operations on the mobile phone through voice [16]. Image recognition can use a computer to process and analyze images. It can be used to identify different targets and objects, such as face recognition and automatic license plate number recognition, which are often used now. Expert system refers to a computer intelligent program system with considerable professional knowledge and experience. The database it uses is similar to the human brain, the storage capacity and calculation capacity are very good, and it can simulate experts to solve some difficult problems.

The core of artificial intelligence is mainly machine learning and deep learning. The artificial intelligence algorithms are mainly deep learning algorithms and artificial neural network algorithms [17].

2.2.1. Deep Learning Algorithms. The deep learning algorithm is mainly for further research on artificial neural network algorithm in order to improve the learning ability of the algorithm model. It was proposed mainly for algorithms to learn to think like humans [18]. Below we mainly introduce the deep learning model with the RBM model as the main structure. It is a model of energy minimization theory. Its probability formula can be expressed as:

$$Q(C, J) = \frac{R^{-energy(C, U)}}{X}, X = \sum_{C, J} R^{-ENERGY(C, U)}, \quad (1)$$

where energy (C, U) represents the energy of the model, and C and J mean the variables in the model, as shown in Figure 6.

As shown in the figure, the same level of the model is independent, so the energy formula of the model can be expressed as:

$$ENERGY(C, J) = -N^Y C - B^Y J - J^T E C, \quad (2)$$

where E, B, and N represent the parameters between layers. From the above two formulas, we can infer that the conditions of the hidden nodes are independent.

$$Q(J|C) = \frac{R^{N^Y + V^Y J + J^Y E C}}{\sum_{J'} R^{N^Y + V^Y J' + J'^Y E C}}, \quad (3)$$

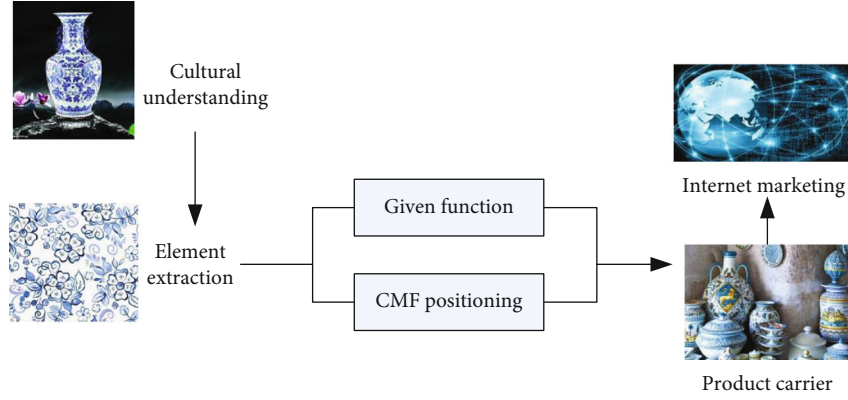


FIGURE 2: Development design flow.

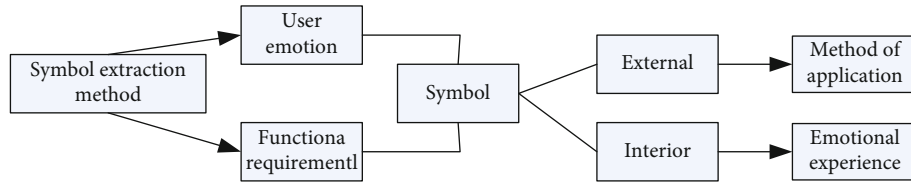


FIGURE 3: Visual element and representative symbol extraction method.

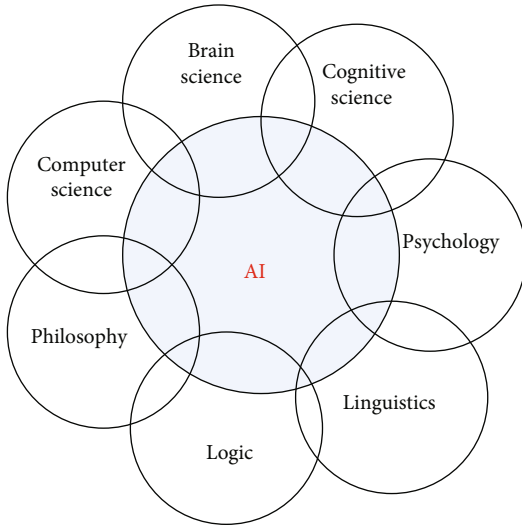


FIGURE 4: Relationship diagram.

$$Q(J|C) = \prod_O \frac{R^{J_O(V_O+E_O C)}}{\sum_{J''} R^{J''_O(V_O+E_O C)}}, \quad (4)$$

$$Q(J|C) = \prod_O Q(J_O|C). \quad (5)$$

If J_O falls within the range of 0 or 1, the probability of the 0th node can be expressed as:

$$Q(J_O = 1|C) = \frac{R^{V_O+E_O C}}{1 + R^{V_O+E_O C}}, \quad (6)$$

$$Q(J_O = 0|C) = \frac{1}{1 + R^{V_O+E_O C}}, \quad (7)$$

$$Q(J_O = 1|C) = SIGM(V_O + E_O C). \quad (8)$$

Because C and J are two variables, they are also symmetric in the formula, E_K represents the Kth column of the E matrix, and we can get:

$$Q(C|J) = \prod_O Q(C_O|J), \quad (9)$$

$$Q(C_O|J) = SIGM(N_O + E_K^Y J). \quad (10)$$

In order to obtain effective results in the process of product development and application, feature extraction is also a very important link in deep learning. C^{ORI} represents the original eigenvector, and N and D represent the mean and variance.

$$C^{NOR} = \frac{C^{ORI} - N}{D}. \quad (11)$$

2.2.2. Artificial Neural Network Algorithm. This algorithm has a good learning ability to represent the relationship between the feature vector and the target value [19]. To create a good model of this type, one must determine the variable parameters in the data to get the number of neurons per hidden node. Although there is no good system to explain so far, we can make changes based on previous research by scholars to obtain the formula:

$$Z = \sqrt{M + L} + S. \quad (12)$$

This algorithm also has some modes of learning and training. The input value for the Nth neuron node of the

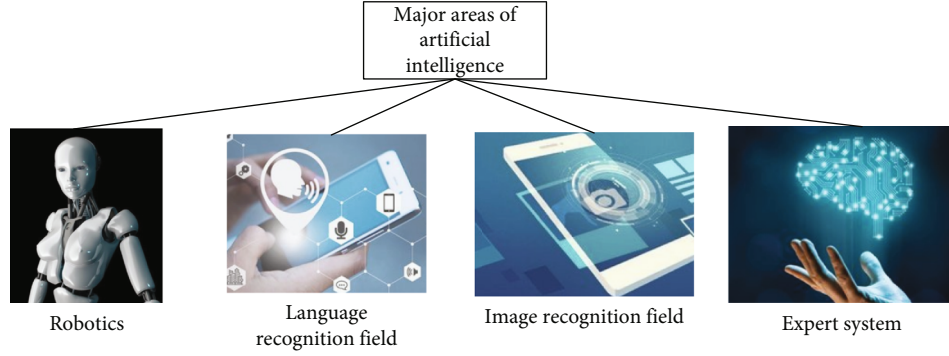


FIGURE 5: Major areas of artificial intelligence.

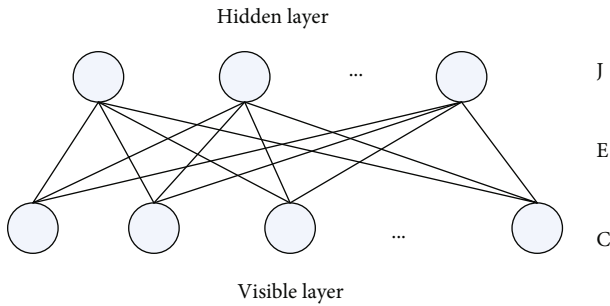


FIGURE 6: Schematic diagram of the RBM model.

hidden layer is mainly the weighted sum M of the calculated values of each bottom layer:

$$M = \sum_{M=1}^M C_M E_{MN} + \vartheta_N. \quad (13)$$

After activation, the output Q of the B th node can be obtained:

$$Q = J_N(M) = G(M) = \frac{1}{1 + R^{-\left(\sum_{B=1}^B E_B + \theta_N\right)}}. \quad (14)$$

However, for the L th node of the final layer, the corresponding output weighted summation formula can be:

$$P_L = \sum_{N=1}^N M E_{NL} + N_L. \quad (15)$$

Then according to the data of the input sample, assuming it is the F th input sample data, it can know that the error formula is:

$$E_F = \frac{1}{2} \sum_{L=1}^L (U_L^F - P_L^F)^2. \quad (16)$$

If the training set has a total of F sample sets, then the overall error of the algorithm can be expressed as:

$$E = \sum_{F=1}^F E_F = \frac{1}{2} \sum_{F=1}^F \sum_{L=1}^L (U_L^F - P_L^F)^2. \quad (17)$$

In order to reduce the error value, it is assumed that $\nabla \vartheta_n$ is the offset correction amount, ∇e_{mn} represents the weight correction amount, and ∇n_l is the final correction amount. Finally, the formulas can be obtained:

$$\nabla \vartheta_n = -\frac{\exists e}{\exists \vartheta_n}, \quad (18)$$

$$\nabla e_{mn} = -\frac{\exists e}{\exists e_{mn}}, \quad (19)$$

$$\nabla n_l = -\beta \frac{\exists e}{\exists n_l}. \quad (20)$$

3. Experiment on Development and Application of Ceramic Cultural and Creative Products Based on Artificial Intelligence

This chapter mainly talks about the current situation of ceramic cultural and creative products and uses the survey method to conduct statistical analysis on them. Then, the main influencing factors of the current cultural and creative products are known, and then the artificial intelligence algorithm of this paper is used for experimental research. This paper attempts to dig deeper into the effectiveness of artificial intelligence in product development and application.

3.1. Current Situation

3.1.1. The Status Quo of Cultural and Creative Works in the Palace Museum. Due to the rapid development of China's cultural industry, cultural and creative products in the Palace Museum have also emerged. Next, we will conduct a current research on the status quo of cultural creativity in the Palace Museum [20]. The development of cultural and creative products in the Palace Museum is also quite representative. At the beginning, its cultural and creative works were relatively normal, lacking in new ideas, and sales were not very good. After bold changes were made, new

products were designed according to the needs of consumers, and the sales volume soared [21]. This article takes the ceramic cultural and creative products mainly based on the tableware of the Forbidden City as an example.

As shown in Figure 7, currently in the Tmall Palace Museum Cultural and Creative Flagship Store, the highest-selling mug is this Jingui Fuyue mug. As shown in the figure, it adopts the theme of the jade rabbit flying to the moon, and adopts the collision of two colors of gold and black. There is also a small rabbit on the lid, which is very cute. The pattern on the cup body is the jade rabbit flying to the moon. It is very representative of traditional Chinese stories. It has very Chinese characteristics. And it can be found that the price of ceramic cultural and creative products in the online store is not set very high, and the price is still very close to the people. And practicality and aesthetics are also high. And there are many classifications of ceramic tableware, which greatly meets people's diverse needs [22]. Moreover, it can be seen from the picture that the sales of such products sold by online stores are also very considerable. Among them, the best-selling is the mug, followed by the ceramic bowl and plate, and the least selling is the saucer. It shows that when people buy cultural and creative products, the most important thing is practicality. And it can also be found that the sales in the official flagship store are still higher than other stores. It shows that customers still pay more attention to the channel and formality of products, and many people may just buy for traditional culture.

After statistics of cultural and creative tableware products, we want to study the sales of other cultural and creative products [23]. Therefore, the top 6 online sales of cultural and creative products of the Forbidden City are presented in the form of a table, as shown in Table 1. First of all, we can find that the unit price of the top six cultural and creative products does not exceed 150 yuan, the price is very close to the people, and it can be seen that the top six products are mostly bought by women. This shows that the majority of consumers are women. Among them, the highest-selling product is the matte lipstick. Its monthly sales volume has reached 12,000+, and the monthly sales revenue is 14.44 million+, which is enough to prove the success of this product design. The sixth kitten ornament is a ceramic cultural and creative product. Its unit price is very low, only 20 yuan. Its monthly sales are also very impressive, with 9,000+ and monthly sales income of 171,000+. The popularity is also very high. In short, a product with good ideas and high practicability will not have low sales, so when we develop new products, we should consider how to develop this product from the perspective of consumers.

Below, the author selects four museums to conduct research on their cultural and creative products and try to find out the properties of ceramic products inside. As shown in Table 2, some relevant information can be obtained from the table. The general types of museums are mainly teacups, coasters and tea sets. The main reason is that these products are more practical and convenient for development and application [24]. Among them, some museums also designed related skin care products and cosmetics, which shows that the cultural and creative industry has paid atten-

tion to the purchasing power of female consumers. It began to shift its center to female consumers and designed many products that cater to the current needs of women. In addition to the above, we can also find that the museum also designed a lot of small things, such as sticky notes, refrigerator magnets and decorative ornaments. This shows that the design range of cultural and creative products is very wide, and almost anything can be designed into cultural and creative products. Then, in terms of design ideas, we can find that the first choice of many museums is the shape of the product, and then the pattern. Some also focus on function and meaning. These are also very important for a cultural and creative product.

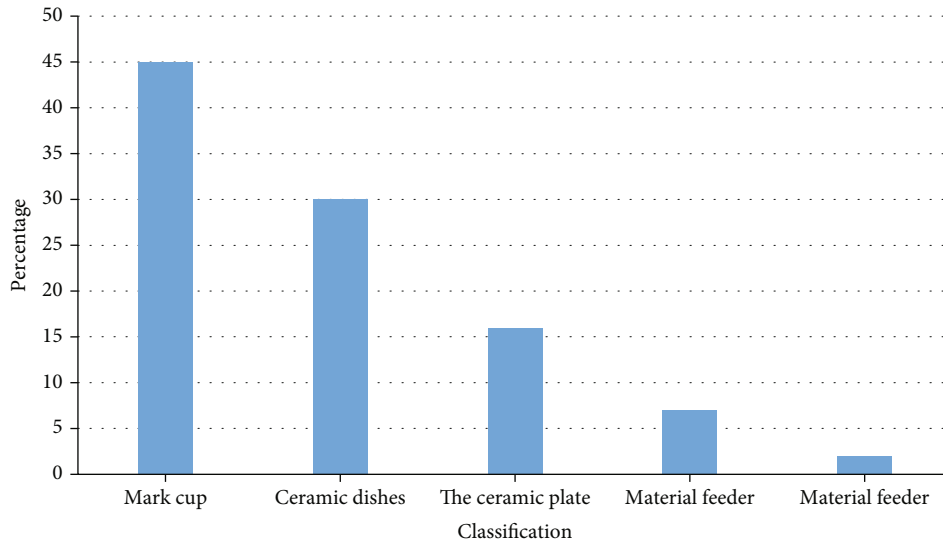
In addition to investigating the cultural and creative products of the four museums, the author also investigated the collections of several famous porcelain factories in Jingdezhen (# indicates the number of items in the collection, and X indicates none, as shown in Table 3). It can be found that the Jianguo Porcelain Factory has the most collections, and it has collections of three types of porcelain. However, the Xinhua Porcelain Factory is a new factory, so it does not collect some of the more historically valuable porcelain. Xinhua Porcelain Factory mainly manufactures the porcelain of the present craft. There are also many collections in the People's Porcelain Factory. It has collections of national ceremony porcelain and celebration porcelain. All in all, from their collections, it can be seen that the craftsmanship of these porcelain factories is mainly concentrated, and then designers can use these traditional cultural elements to design new cultural and creative products.

3.1.2. Questionnaire Survey. In order to gain an in-depth understanding of consumer demand for cultural and creative products, we conducted a questionnaire survey. The survey questions are what are must-haves for a cultural and creative product. It produces questionnaires through paper questionnaires and questionnaires.

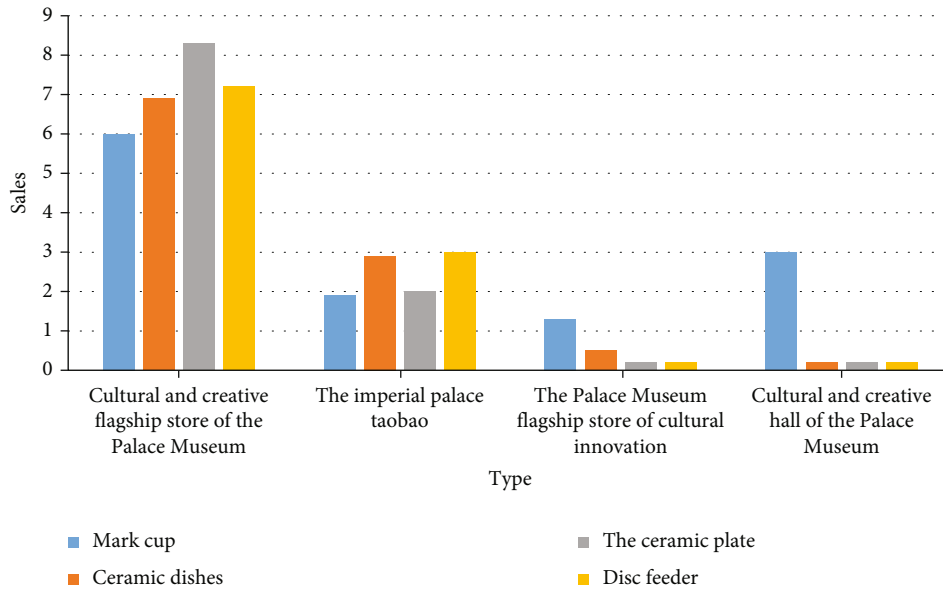
The survey results are shown in Figure 8. In terms of cultural connotation, 123 think it is very important. 109 respondents believed that commemorative significance is very important, because when buying a cultural and creative product, it is hoped that it has a collection value and can be kept as a memorial forever. In terms of unique ideas, 90 people chose unique ideas, because when buying a product, it is important that it is different, unique, and can attract people's attention. 80 people chose high quality, because if the quality of a product is not good enough, it will not be pleasant to buy it again, so quality is also very important for cultural and creative products. In other respects, there are also many people who choose green environmental protection, high quality and low price, and fashion and beauty, and they think these characteristics are also very important. However, in terms of design style, we simply divided three styles, one simple, one traditional, and one cartoon. From Figure 8, it can be found that 60% of people choose the traditional style. It seems that people's pursuit of traditional culture is still very profound, to pass on traditional culture and support the trend of traditional culture. 28% of people chose the cartoon style, but the combination of ceramics and cartoons is



(a) Jingui Floating Moon Mug



(b) Classification of cultural and creative ceramic tableware



(c) Sales volume of different online platforms of Ceramic Culture and Creation

FIGURE 7: Ceramic tableware cultural and creative products.

also very innovative, and it is a style that young people like very much now. 12% chose the simple style. It seems that although this style may be very fashionable when combined with ceramics, it has always lost a little quaint charm. There-

fore, it can be concluded that the development and design of ceramic cultural and creative products still have to be designed and developed according to consumers' preferences, and then add the designer's design concept so that it is better to design.

TABLE 1: Details of the top six cultural and creative products in sales.

Name of commodity	The unit price	Monthly sales	Monthly sales revenue
Crane matte lipstick	121	1300+	1440000+
Moist lipstick	121	8600+	1020000+
Monochromatic eye shadow	67	6100+	396000+
Take capsule bracelet	81	5600+	440000+
Key chain	52	7100+	357000+
Cat ornaments in the palace museum	20	9100+	171000+

TABLE 2: Design and arrangement of related museum cultural and creative products.

The museum	Species	Design ideas
China Ceramics Museum	Hanfu, coasters, mirrors, cups, replica disks, decorative ornaments	Shape pattern color
Palace Museum	Necklaces, teacups, cushions, tea sets, filing bags, porcelain carvings	Shape design function color implication
National Museum of China	Fridge magnets, protective covers, notepads, lamps	Modeling design meaning
The Summer Palace	The notebook	Modelling design

TABLE 3: Collections of Porcelain Factory.

Porcelain factory name	Country gift porcelain	Celebration of porcelain	To commemorate the porcelain
The founding of the porcelain industry	#Sanyang Kaitai glaze flat belly bottle	##azure pile plum blossom earth bottle, blue and white glaze red hundred words figure bottle	#azure pile plum blossom earth bottle
Porcelain factory names	#blue and white Wutong tableware	#blue and white and sunflower tableware	X
Xinhua porcelain factory	X	X	X

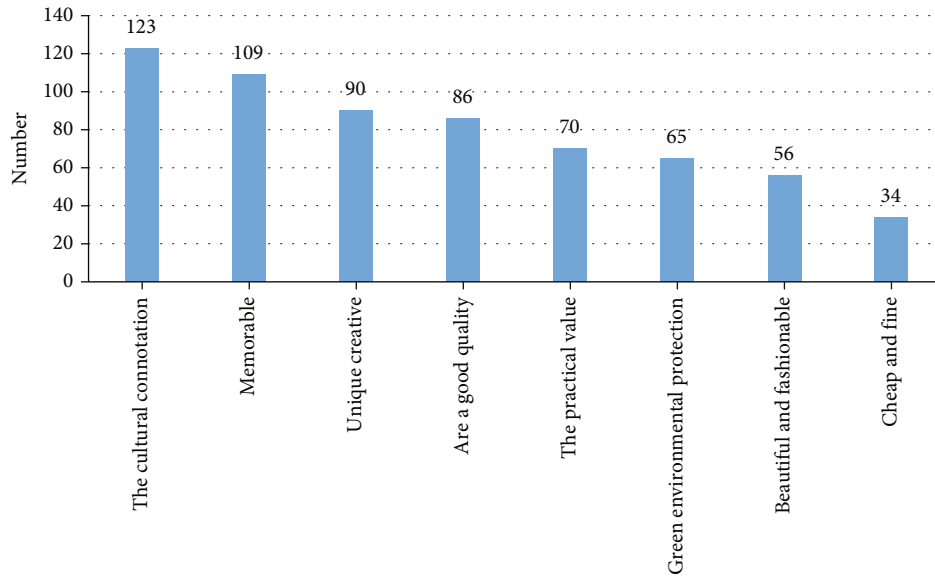
3.2. Experiment

3.2.1. Feature Extraction Experiment. In order to verify the feasibility of the above AI algorithm, we will compare the experimental results between the features processed by the deep learning algorithm and the features processed without it. Using the two sets of experimental data of A and B, the algorithm is used to perform feature extraction experiments on these two sets of data, and finally Figure 9 is obtained.

As shown in Figure 9, two sets of data that need feature extraction are given. For different extraction expectations, the feature vectors that use and do not use the algorithm are used as different visual element indicators. As can be seen from the figure, when the expected value is 5%, a maximum value is obtained. And it can be found that the eigenvalues extracted by the algorithm are higher than the eigenvalues extracted by no practical algorithm. This shows that the algorithm proposed in this paper is very suitable for the development and application of cultural and creative products. Artificial intelligence technology can well discover the inherent characteristics of products through appearance. Among them, it can also be seen that when the designers hope that the extraction feature rate is higher, the feature extraction value of the product is lower. It shows that the designer will forget to extract the essence of cultural relic features when they are eager for success. Feature extraction is not just a one-to-one replication, but a new feature display with thinking.

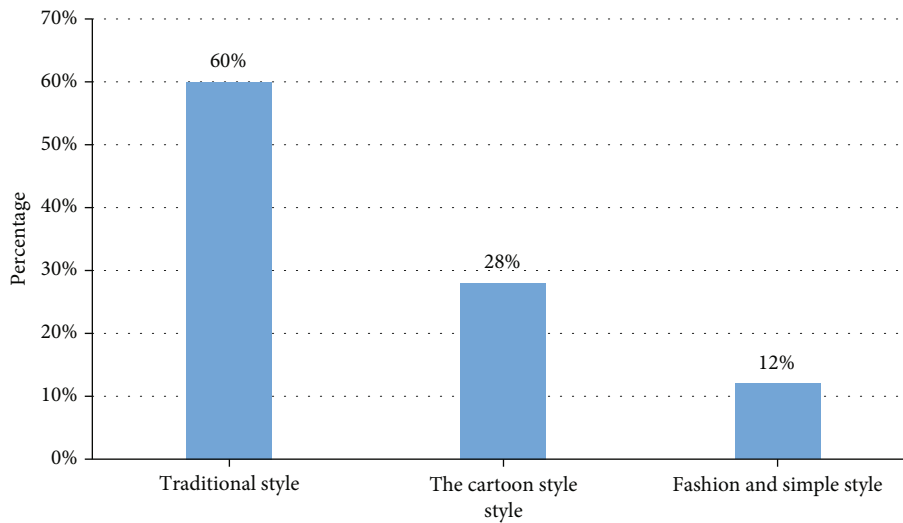
In order to know more clearly the effectiveness of using the algorithm in this paper for product development and application, we refine the eigenvalues. It is divided into four indicators to prove the superiority of the algorithm in this paper. The experiment is also carried out on the two sets of data of A and B. The result is shown in Figure 10.

As can be seen from the figure, whether it is on data A or data B, the effect of feature extraction through algorithm is better than that without algorithm extraction. And on the four feature indicators, the algorithm extracts features very well. Taking A data as an example, in terms of shape, the shape is the first step to determine the trend of the entire product for a ceramic product. It can achieve a complete extraction rate of 0.71 after extraction by the algorithm and only 0.65 without the use of the algorithm. In terms of color, color is the first impact for people. After using the algorithm, the extraction of color can reach the extraction of 0.74, and the efficiency can only be 0.7 without using it. In the extraction of texture, texture is the most difficult step to reproduce. The difference of ceramic refining temperature and materials will affect its texture trend. Using this algorithm, texture can reach the extraction level of 0.76. It can only have a level of 0.7 without using it. On the pattern, the pattern is the feature that can best show the uniqueness of the ceramic craft. It can reach the extraction level of 0.73 after using the algorithm for extraction, and only 0.66 without using it. This shows that the use of artificial intelligence technology can play a very important role in the development and application of ceramic cultural and



characteristics

(a) Indispensable features of cultural and creative products



(b) A love of design style

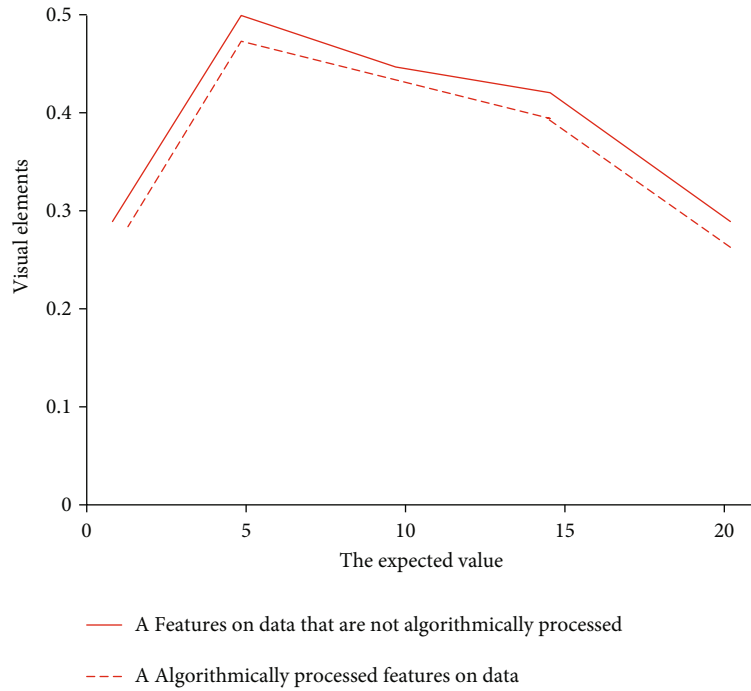
FIGURE 8: Questionnaire results.

creative products, which can make the development process very smooth and greatly improve the efficiency.

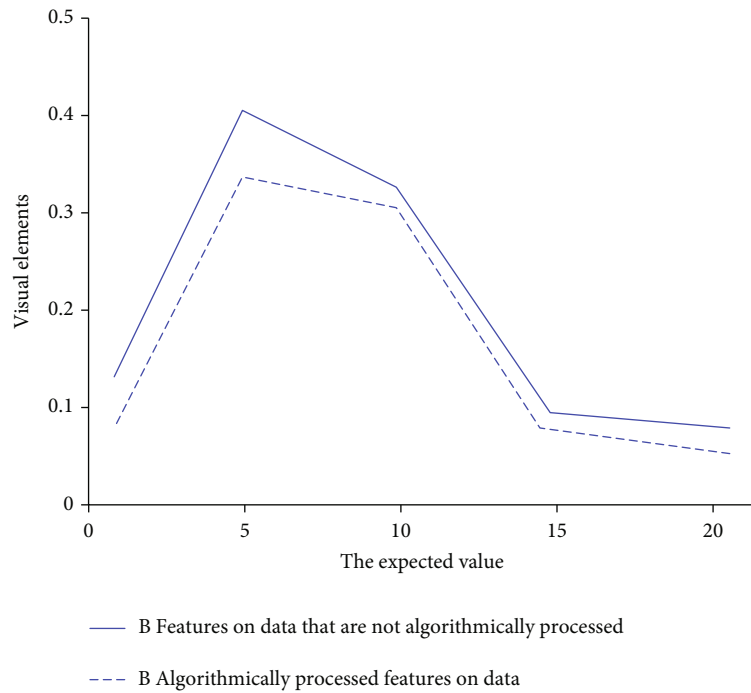
3.2.2. Program Digitization. With the rapid development of technology, there are many ways to survey consumers, and all text solutions can be converted into data and then researched. The case we used this time is the comment area about porcelain cultural and creative products, which is based on the comments of netizens to conduct a survey of consumers' demand for products. Among them, we use a, b, c, d, and e to express the customer's emotion or demand intensity, which means like, agree, neutral, endure, and disgust. For example, a means a like, and then artificial intelligence is used to automatically determine different emotional values based on the content of the four netizens' comments. Therefore, the preliminary digitized table is

obtained as shown in Table 4. From the Table, we can know that in terms of creativity, the four users basically maintain a neutral attitude, and two are not very satisfied with the current cultural and creative products, they feel that they do not have very unique ideas. Therefore, the creativity of cultural and creative products is really very important. In terms of practicality, users are basically satisfied. There is almost no objection in terms of price, but in terms of cultural connotation, the three users are not very satisfied, because they feel that these products have lost the cultural soul of ceramics and do not have a real cultural connotation.

Later, this article can be modified according to this scheme, which uses an evaluation algorithm to test the feasibility of artificial intelligence in the development and application of ceramic cultural and creative products. It uses the PHGH method to quickly and scientifically convert the



(a) A data

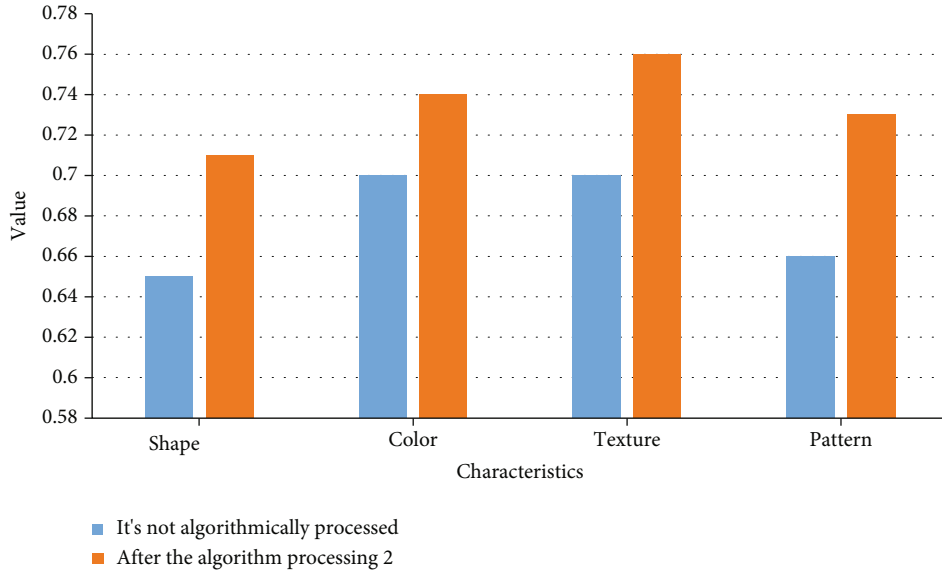


(b) B data

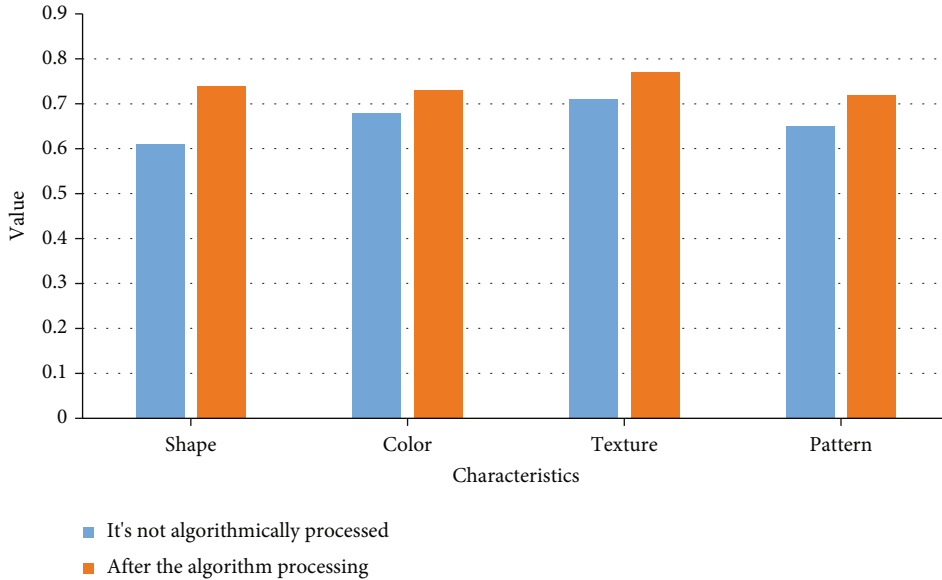
FIGURE 9: Feature extraction comparison of two data.

opinions of the design team into evaluation indicators, focusing on how to select the product that best meets the user's needs and user experience from many design schemes. The evaluation process using the PUGH matrix is mainly divided into three steps. The first step is to determine a benchmark scheme, which is one of all schemes. The selection criteria are based on the evaluation indicators formulated by experts and selected by members of the pro-

fessional group. In the second step, the evaluation team compares the other schemes in turn with the benchmark scheme. When the compared scheme outperformed the benchmark scheme in terms of current evaluation factors, it was marked as "+", and the compared scheme with the same performance as the benchmark scheme was marked as "0". When the comparison scheme performs worse than the benchmark scheme in the current evaluation factors, it



(a) Feature extraction of A data



(b) Feature extraction of B data

FIGURE 10: Feature index comparison.

TABLE 4: Examples of digitization scenarios.

	Creative	Practical	The price	The cultural connotation
1	c	b	b	d
2	d	c	b	d
3	b	b	b	c
4	c	c	c	d

TABLE 5: Example of PUGH evaluation.

	Plan 1	Plan 2	Plan 3	Plan 4
1	0	0	—	0
2	0	0	0	0
3	0	0	—	—
4	0	+	0	—
5	0	0	0	—
6	0	0	0	0

is recorded as step 3. After the evaluation team completes the evaluation and scoring of the programs, count the number of “0” and “+” of the optional programs, and calculate the evaluation ranking of all the programs.

As shown in Table 5, with scheme 1 as the benchmark scheme, all other schemes from A to G are compared with

scheme 1, and the scores from high to low are scheme 2, scheme 1, scheme 3, and scheme 3, respectively. As a result, the optimal or better solution can be quickly selected as

solution 2. It is also the artificial intelligence algorithm scheme of this paper.

4. Conclusion

This paper studies and analyzes ceramic cultural and creative products through artificial intelligence technology and concludes that artificial intelligence technology is of great help to promote the development of cultural and creative products. In general, artificial intelligence technology should be used to conduct a preliminary investigation and evaluation when developing and applying cultural and creative products. China attaches great importance to the promotion of traditional culture. The development and application of ceramic cultural and creative products is also the best way to express cultural connotations so that the public has a new understanding of these traditional things. Due to the limited space of this paper, there is no detailed analysis in various aspects of product development and application. And there are not enough examples used in this study, which is also the limitation of this paper. In the future, it is hoped to use more real data to conduct in-depth research so as to explore the role of artificial intelligence technology in cultural and creative products.

Data Availability

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

Conflicts of Interest

The author declares that they have no conflicts of interest.

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