

Research Article

Application of Factor Analysis in Image Modeling Design of Environmental Protection Gold Stove

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In order to design an environmentally friendly gold furnace that considers both traditional cultural elements and modern decorative elements, this paper puts forward the application of factor analysis in the image modeling design of an environmentally friendly gold furnace. Firstly, the elements of lines, colors, and patterns were extracted by factor analysis. By using the hierarchical structure model and factor analysis, the synchronous parameter fusion model of image modeling design factors of the environmental protection gold furnace is constructed to fuse the output reliability parameters of image modeling of the environmental protection gold furnace and adjust them adaptively. The factor analysis and process control of image modeling of environmental protection golden stoves are carried out using the method of differential feature analysis. Then, the Atlas and image Kanban are analyzed, and the image design factors of the environmental protection golden stove are excavated. Finally, the concepts of cultural space and cultural time are introduced. Based on the study of historical and material materials, the overall comparative analysis is carried out from three aspects: shape, color, and pattern. Combined with the extracted target image and the excavated design factors, the image modeling design of the environmental protection gold furnace is effectively carried out, providing design methods and sample references for the innovative design of the environmental protection gold furnace. The experimental results show that the mining design factors can effectively analyze the problems existing in the modeling design of the current environmental protection gold furnace, with a low bit error rate and strong practicability.

1. Introduction

The images brought to people by products are complex and diverse, and the degree of people's demand for different images also varies. Simulating animal behavior through the algorithm mathematical model of distributed parallel information processing has certain advantages for the mapping processing of patterned knowledge and has the characteristics of fuzzy association. At the same time, it can learn new knowledge to continuously improve its knowledge structure [1, 2]. Due to its unique nonlinear information processing technology, it effectively improves the processing ability of intuitive information. It is often used to establish the complex relationship between input and output variables and has been successfully applied to the image modeling design of the environmental protection golden furnace and other fields [3, 4]. In order to obtain the optimal modeling combination, it

is necessary to sort the modeling images. The key step is establishing the image weight, which is of great significance in realizing the multi-image design of product modeling.

Reference [5] proposed a forward fading surface modeling idea and method based on CATIA software as a three-dimensional platform and NURBS surface construction theory. Firstly, the drawing is analyzed to determine the modeling characteristics and attributes of the hood fading surface. Secondly, the characteristic line surface method and control point surface adjustment method are used to complete the modeling design of the tapered surface of the engine cover, and the design process and points for attention are described. Finally, through surface assembly and other surface quality evaluation methods, the designed surface is well connected with other parts of the front wall of the school bus and meets the requirements of surface smoothness, which can provide an effective theoretical basis for subsequent engineering

design. Reference [6] proposed applying the genetic algorithm to industrial product modeling design in a virtual reality environment. Through the hierarchical product modeling structure, the product modeling gene code is designed, and the fitness function is used to evaluate the individual fitness to determine the individual fitness of the code. The evolution of the product modeling design scheme is supported by the genetic operator. After meeting the conditions of manual participation, the design scheme is evaluated manually in the virtual reality environment until the scheme satisfactory to users is produced. Reference [7] proposed an intelligent modeling design method based on the product image database using image processing technology based on deep learning to inspire designers to develop new products and optimize the product design process. Firstly, the crawler technology is used to capture the product image from the shopping website, and the image processing algorithm is used to remove the repeated and chaotic image. Then, analyze the objective features contained in the image, classify and label the image using multilabel learning technology, and form a multilevel flexible classification product image database with labels that can be updated in real time. The database can help designers use labels for retrieval. A new image similar to the original image but different is generated using the generative confrontation network technology for style transfer learning. Finally, experienced designers participate in the design and get a new scheme sketch. Reference [8] takes the design project of the Chinese Zodiac rat tea set as an example and puts forward a design method of cultural and creative products based on Chinese Zodiac culture. Firstly, it demonstrates the typicality and particularity of the Chinese Zodiac mouse in the Chinese Zodiac culture and concludes that the design method of cultural and creative products of the Chinese Zodiac mouse has strong applicability. Under the symbolic trivalent model proposed by Pierce, through investigation and collection of the cultural content of the zodiac mouse, we can screen out the cultural meaning with high recognition and positive content. Combined with the biological form of “mouse” and the functional appeal of the tea set, choose a reasonable product image to convey the meaning of zodiac culture.

The above research has conducted beneficial discussions on product modeling design from different aspects [9], which provides a theoretical basis for the image modeling design of the environmental protection golden stove. Therefore, this study establishes the relationship system between the two cultures based on cultural space and cultural time and constructs the image modeling design method of environmental protection Golden stove using perceptual engineering and factor analysis methods.

2. Application of Factor Analysis in Image Modeling Design of Environmental Protection Gold Stove

2.1. Image of Environmental Protection Golden Furnace. The lion dragon is a mythical lion that Buddha considered very patient and took as a mount. Therefore, the censer is

often decorated with a lion dragon. Censers shaped and decorated with lion dragons were so popular that the “lion dragon” was often used later as a synonym for censers. The lion dragon has a rough shape, and its cheeks are plump with the gorgeous pattern depiction of the lion’s body and the ups and downs of the skeleton shape [10]. With dynamic facial features and skeleton components, it forms a folk art that combines the beauty of spirit, shape, and state.

The lion dragon has a rough appearance, a high and sloping forehead, bright eyes, a wide mouth, a garlic nose, and full and plump cheeks with a gorgeous depiction of the lion’s body and the undulating skeleton shape. With controllable dynamic facial features and skeleton components such as round lips, open teeth, vibrating tongue, and sharp ears, it forms folk art integrating the beauty of spirit, shape, and state.

2.2. Factor Analysis. Factor analysis is mainly an exploratory technique used to analyze data and have a general understanding of them before analysts conduct multivariate data analysis. It is a very necessary process. In multiple regression, factor analysis can help determine whether there is collinearity or conditional index and can also be used to deal with collinearity. The advantage of factor analysis is that a few factors are used to describe the relationship between many indicators or factors. In other words, several closely related variables are grouped into the same category, and each category of variables becomes a factor, reflecting most of the information of the original data with fewer factors. Using this research technology, we can easily find out the main factors affecting the image modeling of the environmental protection golden furnace and their influence. In this study, the modeling, color, and pattern factors are mainly analyzed.

2.2.1. Modeling Factor Analysis. This paper collects numerous physical objects and picture data for sorting and analysis, summarizes the characteristics of its typical samples with the method of chart analysis, and introduces the symbols that can express the cultural connotation into the design of environmental protection gold stove [11, 12] to enhance the interactive experience of consumers on Folk culture so that consumers can arouse the thinking association of a regional culture from the visual experience of the first sense to the actual use process.

The extraction process of modeling elements is as follows.

Use Photoshop to truly and completely draw the original detail modeling of the environmental protection gold furnace:

- (1) In the realistic method, through the first line extraction, select the front and side view of the environmental protection gold furnace.
- (2) In the simplified method, many patterns are involved in the environmental protection gold furnace, and the contents of the decorative parts of different patterns are extremely complex. When used in the

element design of the environmental protection gold furnace, copying all the original patterns in the modeling design of the environmental protection gold furnace is unnecessary. Therefore, we should mainly grasp the key characteristics of patterns. Through the second line extraction, the outline of the environmental protection gold furnace is simplified and abstracted, and the complex decorative lines are subtracted to remove the redundant decorative details.

- (3) The reconstruction method takes the abstract and simplified face contour as the basic element, further geometrically simplifies the elements, and then rotates, repeats, and stretches the geometric pattern elements of the shadow play.

2.2.2. Color Factor Analysis. China’s color culture integrates the color views of Confucianism, Taoism, Buddhism, and vulgarity and embodies the philosophical thought of “the unity of heaven and man.” This view of color is based on metaphysics, which is intuitive, psychological, subjective, and empirical. The color of the lion dragon golden stove does not aim to imitate and reproduce real things. It does not depend on objective images but surpasses the real lion. The environmental protection golden stove draws the color of the character’s face from the traditional opera. The character of different characters is reflected in the color proportion and decorative color of red, black, and white. Among them, most of Liu Bei’s lions are yellow-faced golden lions, with white fluffy and colored lion bodies. The overall color matching is light and lively. Guan Gongshi is decorated with black toothbrush whiskers on the base of red, which represents loyalty and righteousness in Facebook, reflecting a certain aggressiveness. The contrast of red and black colors produces a striking visual impact, increases the lion’s head weight as a martial lion, and gives people a sense of awe without anger. The color of Zhang Feishi is mainly black and white, with white lines on a black background or green edges in a gray pattern. It shows a sense of integrity, bravery, and even recklessness and vividly reflects the rugged and powerful physique of the environmental protection gold stove and the mighty and handsome spirit (Figure 1) [13].

2.2.3. Pattern Factor Analysis. Ornamentation is a spiritual entity to express people’s deep-seated ideas or abstractions [14]. Folk people have always described the lion dragon pattern as “tiger eyes and cheeks on both sides, forehead and top reaching the sky.” The lion dragon’s forehead is decorated with a cloud head Ruyi pattern, also known as “pig nose soul.” With the spread of Buddhism and the integration of local and foreign cultures, Ruyi has gradually become a decorative object and pattern shape containing the aesthetic spirit of the Chinese nation and auspicious implication [15]. The Ruyi pattern on the forehead of the lion dragon also expresses people’s expectations for auspiciousness and peace. The most frequent pattern in the lion dragon is the Tang grass pattern around the lion’s mouth. Different from

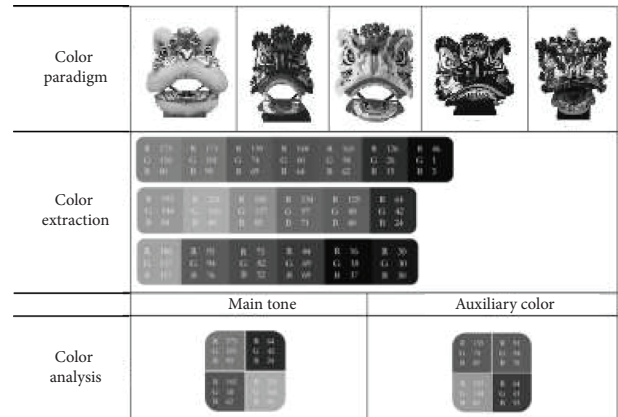


FIGURE 1: Color factor analysis.

the traditional flower and grass patterns that collect a variety of flowers and plants, Tang grass patterns form regular and upward growing grass leaves after certain deformation and artistic processing to imitate the beard of the lion, which not only enriches the formal beauty of the lion dragon but also includes the Creator’s worship of nature, with special cultural connotation. Other patterns, such as the grass tail pattern from the cheeks on both sides to the curling up at present, the tiger stripe on the back of the lion dragon’s head, the bamboo basket pattern marking the name of the making master, the dot pattern in groups corresponding to the grass tail pattern, and the small spot pattern on the lion dragon’s ear, decorate the lion’s head, forming a gorgeous, vivid, auspicious, and powerful charm (Figure 2) [16].

In addition, the mirror in the center of the lion’s forehead is called “Tianting.” There are plush tassel balls around the mirror for decoration, and the modeling combination of tassel balls and Tianting is also absorbed from the headdress of the Cantonese opera character “crown prince helmet.” From the simplification of the northern lion to the magnificence of the southern lion, we can see that, under the influence of history, culture, and environment, the prosperity of opera culture and bamboo binding technology have promoted the integration of Guangdong regional culture and the image of classic lion dance, forming a unique environmental protection golden furnace.

3. Image Modeling Design of Environmental Protection Golden Furnace with Cross-Cultural Integration

3.1. Cultural Space and Cultural Time. The (finite or infinite) place where objects exist and move, and cultural space is an abstract concept. Cultural time is a concept corresponding to the sequence of things in people’s view. Time has no corresponding entity, and it is just a concept designated to facilitate people to logically establish their understanding of things. However, this concept can correspond to the difference between the sequence of two things, so it has practical significance. Culture is all human spiritual activities and their products in terms of economy and politics, a very broad and humanistic concept. In short, culture is the













Pattern prototype	Factor characteristics	Factor characteristic element
		
		
		
		

FIGURE 2: Pattern factor analysis.

general term for the forms of human life factors in the region: clothing, crown, culture, things, food, housing, and transportation, among others.

All matter in the universe is in the process of alternating time and space, and culture is no exception. The emergence of cultural space is obtained through cultural practice. The existing creation can be divided into three forms: 1) to recreate some cultural spaces that have become “ruins”; 2) to create new space according to the theme of a certain culture; and 3) to transform one kind of cultural space into another.

The ideological framework of cultural space and cultural time is shown in Figure 3. It represents cultural space vertically and cultural time horizontally.

In space, the environmental protection gold furnace is affected by three elements: human, function, and environment. In terms of time, what affects the environmental protection gold furnace is the life cycle and the evolution history of its similar environmental protection gold furnace. Herein, culture is regarded as a composite whole, and its space refers to the place where traditional cultural activities are held regularly or the expression forms of traditional culture are displayed intensively. The human, function, and environment elements will change over time. Therefore, the cultural space will evolve until it evolves into another similar cultural space, resulting in multiculturalism. The establishment of the concepts of cultural space and cultural time can recognize the emergence, development, and change of culture as a whole.

The relationship between culture and design is closely linked [17]. Starting from cultural space and cultural time, let the form design of the environmental protection gold furnace achieve reasonable integration, and improve the cultural recognition and identity of the environmental protection gold furnace form. In order to blend phenomenon of different cultures in space and time. This study extracts the image from one culture according to the actual needs, determines the target image, and then excavates the modeling design factors for the target image from another culture to realize the image modeling design of environmental protection golden stove with cross-cultural integration.

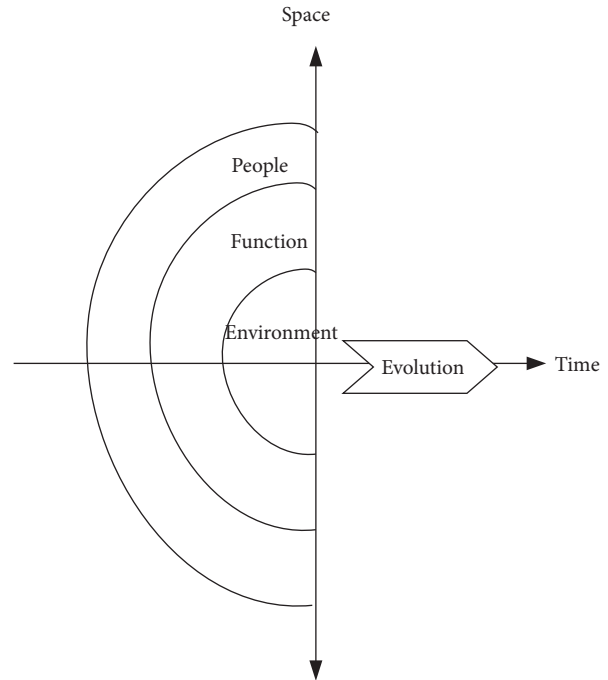


FIGURE 3: Ideological framework of cultural space and cultural time.

3.2. Design Factor. Factor design is a kind of experimental design. In order to investigate the main effect and interesting interaction effect of the image modeling factors of the environmental protection gold furnace, all or part of the factors are processed to perform the experiment so that the effects to be investigated are not mixed. It is composed of combinations of different factors at different levels. The factor design is used to calculate two or more factors at the same time, and AHP is used to mine the design factors of the environmental protection gold furnace. Firstly, the hierarchical structure model is established to analyze and group the factors contained in the target problem and clarify the hierarchical relationship. Secondly, list the analysis Atlas and classify the samples with similar attributes. Finally, according to the constructed image Kanban, users can judge the elements in the hierarchy and determine their relative importance to obtain the relatively important modeling design factors in the image modeling of the environmental protection golden furnace.

3.2.1. Cultural Hierarchy Model. The gene concept was first proposed in biology and then applied to design to extract the internal and external characteristics of design objects. Among them, culture-related design genes are called culture factors. According to the above research, the most influential factors in image modeling of the environmental protection golden furnace are color and pattern [18, 19], which are carried out by the analytic hierarchy process. The hierarchical analysis structure of image modeling of the environmental protection gold furnace is shown in Figure 4.

According to the hierarchical analysis structure in Figure 4, the image modeling factor analysis of the environmental protection golden furnace is realized. There are M

environmental protection golden furnace image modeling nodes A_1, A_2, \dots, A_n , and the information degree of each environmental protection golden furnace image modeling node is expressed as f_j , respectively. At the same time, the final position of N environmental protection golden furnace image modeling factors is B_1, B_2, \dots, B_N . The fuzziness detection method fuses the output reliability parameters of environmental protection golden furnace image modeling information [20]. The j component is as follows:

$$[F(x)]_j = \frac{F(x)}{x_j} \sqrt{2 \sum_{i=1}^N v_i(x) \frac{v_i(x)}{x_j}}. \quad (1)$$

In the previous formula, $v_i(x)$ is the change trend of image modeling of the environmental protection gold furnace, $F(x)$ is the fuzzy scheduling function of image modeling of the environmental protection gold furnace, and $v_i(x)$ is the difference function. By using the factor analysis method, the difference function of image modeling factor analysis of the environmental protection gold furnace is expressed as follows:

$$F(x) = J^T(x) \div 2v(x). \quad (2)$$

In the previous formula, $J^T(x)$ is the value function of factor analysis and $v(x)$ is the equilibrium parameter. In the

interval of a real number field, when $d = 4, s_c = 3/2$, the automatic adjustment of design factors is carried out through fuzzy adaptive adjustment [21], and the statistical characteristic distribution matrix $J(x)$ of image modeling design factors of environmental protection golden furnace is output as follows:

$$J(x) = \begin{pmatrix} v_1(x)x_1 & v_1(x)x_2 & \cdots & v_1(x)x_n \\ v_2(x)x_1 & v_2(x)x_2 & \cdots & v_2(x)x_n \\ \vdots & \vdots & \ddots & \vdots \\ v_n(x)x_1 & v_n(x)x_2 & \cdots & v_n(x)x_n \end{pmatrix}. \quad (3)$$

In the previous formula, $v_n(x)$ is the scheduling component of the image modeling design factor of the environmental protection gold furnace and x_n is the joint characteristic solution. The differential feature analysis method is used to analyze the image modeling factor of environmental protection golden furnace, define the regularity index $s_c = d - 1/2$ of image modeling of environmental protection golden furnace, consider the load information of image modeling of environmental protection golden furnace, establish the comprehensive architecture model of image modeling of environmental protection golden furnace, and obtain the space planning function expression of factor analysis as follows:

$$Q = \sum_{i=1}^m \sum_{j=1}^n C_{ij} X_{ij}, \quad (4)$$

$$\text{Subject to } \begin{cases} \sum_{j=1}^m X_{ij} = a_i, & i = 1, 2, 3 \dots n, \\ \sum_{i=1}^m X_{ij} = b_j, & j = 1, 2, 3 \dots m, \\ X_{ij} \geq 0, & i = 1, 2, 3 \dots n, \quad j = 1, 2, 3 \dots m. \end{cases} \quad (5)$$

In previous formulas, C_{ij} is the joint cross-correlation quantity, X_{ij} is the detection coefficient of environmental protection golden furnace image modeling, a_i is the scheduling coefficient, and b_j is the output load. Therefore, the load balancing parameters of image modeling of the environmental protection gold furnace are obtained, and the differential feature analysis method is used to conduct image modeling factor analysis and process control of the environmental protection gold furnace, which lays the foundation for subsequent Atlas analysis.

3.2.2. Construction of Analytical Atlas. In order to analyze the image modeling of the environmental protection golden furnace and better understand things through images, Atlas refers to systematic classification editing. The charts used to explain things are drawn or photographed according to the image modeling of the environmental protection golden furnace. The analysis Atlas is constructed to interpret the color and pattern factors of the image modeling of the environmental protection golden furnace. Color is a unique symbol of a culture [22, 23].

The main colors of the lion dragon golden stove are green, white, black, gold, and blue. Among them, gold, green, and blue are mainly the colors produced by the impact of the environment. Gold represents the desert and is the symbol of the living environment. Green represents life. Blue is the color of the sky, representing freedom. White and black represent purity and solemnity. The pattern appeared as a decorative element in the early stage, but it became one of the main visual elements in the later stage. The plant patterns are decorative elements based on people's yearning for nature. It is the abstraction and deformation of plants. Geometric patterns are produced to fill the gap in decoration. The structure of the analysis spectrum is shown in Figure 5.

Figure 5 shows that the main structure in the analysis Atlas is the analysis total node, divided into multiple target nodes, providing a reference for understanding the development history of environmental protection gold furnaces and mining design factors of pattern characteristics.

3.2.3. Excavation Design Factors. By selecting 10 experts with rich knowledge of the development history and pattern characteristics of the environmental protection gold furnace,

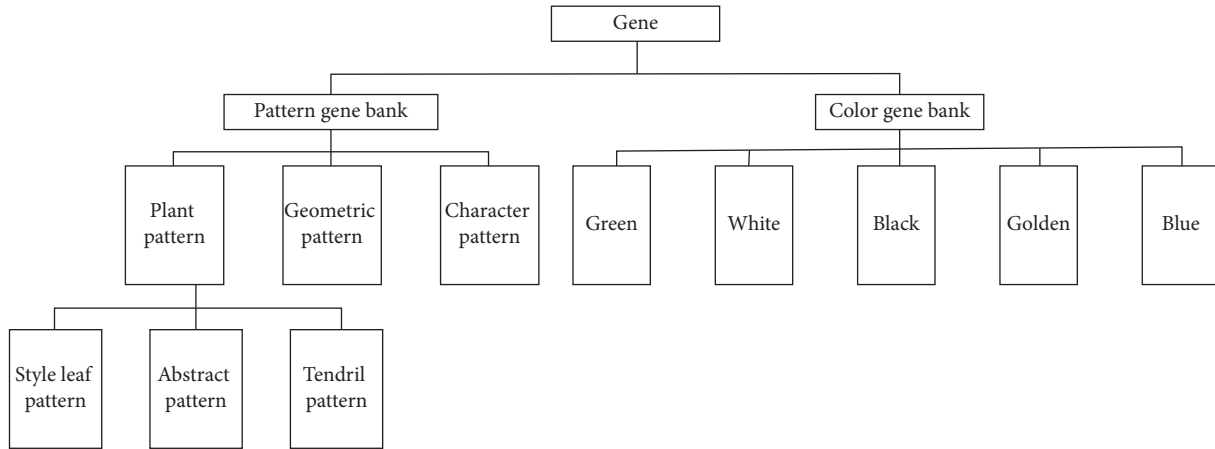


FIGURE 4: Analytic hierarchy process structure.

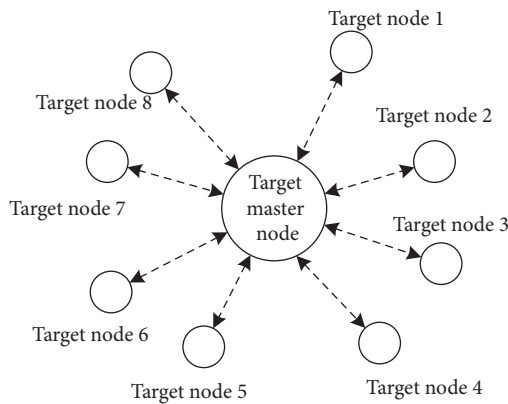


FIGURE 5: Structural diagram of the analytical spectrum.

we solicited design factors. The theoretical basis is that, in order to reduce the uncertainty of factor selection when designing the image modeling of the environmental protection gold furnace, it is necessary to use AHP to decompose the fuzzy design factors into specific and detailed environmental protection gold furnace design factors and obtain the relative importance scores of each factor through a qualitative assignment. Firstly, 10 experts were asked to send the summary of design factors provided by the experts to the experts' mailbox through open-ended answers. The experts retained and deleted the selected design factors and described in detail the specific reasons for retaining or deleting the design factors. After sorting out the design factors retained by the experts, the design factors of the image modeling design of the environmental protection golden stove were obtained and evaluated, as shown in Table 1.

3.2.4. Factor Analysis. SPSS 22.0 statistical software is used to conduct factor analysis on the design factors of image modeling of the environmental protection golden furnace [24, 25]. Bartlett and KMO's sphericity are used to test the factors. The test result is that the KMO value is 0.58 greater than 0.5, the Bartlett sphericity test value is 358.541 (degree

TABLE 1: Design factors of environmental protection gold furnace.

Variable	Content	Score
X1	Green	10
X2	White	10
X3	Black	10
X4	Golden	10
X5	Blue	10
X6	Style leaf pattern	10
X7	Abstract pattern	10
X8	Tendrill pattern	10
X9	Geometric pattern	10
X10	Character pattern	10

of freedom is 195), and the significant difference result is $p < 0.01$. The above results show a good linear relationship between the factors. The above design factors can be used to carry out factor analysis, proving that the ranking results of the factor analysis method have satisfactory consistency. Among them, the analysis factor is the most important factor. When designing the image modeling of the environmental protection golden furnace, we should pay special attention to the product form.

3.2.5. Association Rule Analysis. Association rules are a common method of data mining [26]. Through association rules, we can effectively mine the dependence and association between one thing and other things.

Input the factors obtained from the factor analysis into the software SAS 9.3 for correlation analysis, set the support threshold in the software to 10% and the support to 90%, and finally obtain five strong correlation design factors affecting the image modeling design of environmental protection golden furnace. Find out all frequency sets, and the frequency of these itemsets is at least the same as the predefined minimum support. Then, the strong association rules are generated from the frequency set, and these rules must meet the minimum support and minimum reliability. After that, use the found frequency set to generate the desired rules, and generate all rules that only contain the items of the set, of which there is only one item on the right of each rule.

Herein, the definition of the middle rule is used. Once these rules are generated, only the rules that are greater than the minimum reliability given by the user will be left, thereby completing the application of factor analysis in the image modeling design of the environmental protection golden furnace.

4. Result Analysis

In order to verify the effect and feasibility of the application method of factor analysis in the image modeling design of environmental protection gold stove, the experiment was designed, which was verified by the results of factor analysis, association rule analysis, and image modeling design of environmental protection gold stove. The experimental design was based on four principles, namely, the principle of comparison, the principle of consistency of experimental conditions, the principle of randomization, and the principle of repeatability.

4.1. Factor Analysis Results. To determine the multiobjective image is to locate the various image needs of users for the product. Firstly, collect the image vocabulary and make a questionnaire, then statistically analyze the representative images, and finally determine several images as the target images. Product modeling evolutionary design needs to set decision variables, that is, the change range of product modeling parameters. Generally, appropriate change values are set according to specific problems. The final result of factor analysis is extracted by principal component analysis, as shown in Table 2.

According to the analysis results in Table 2, the eigenvalues of seven factors in the obtained correlation coefficient matrix are higher than 1. The cumulative variance contribution rate can be as high as 76.916%. The factor analysis results show that the information contained in the above 10 variables can be well explained by seven factors: X_1 , X_2 , X_3 , X_4 , X_6 , X_7 , and X_8 .

4.2. Association Rule Analysis. Set the relevant parameters of product multi-image modeling evolutionary design, including rules and confidence. According to the previous analysis, the number of individual serial numbers in the strong correlation design factor is set to 5. The seven factors obtained are analyzed by association rules. The analysis results of association rules are shown in Table 3.

The results of the association rule analysis in Table 3 show that the image modeling design of the environmental protection golden furnace can be evaluated by X_7 and X_6 .

4.3. Image Modeling Design of Environmental Protection Golden Furnace. Based on the above analysis results, the image modeling design of the environmental protection gold furnace is carried out by integrating the design factors of image modeling of the environmental protection gold furnace with a modern cultural image. The design of the furnace is completed through the cooperation of the existing design

team and the image of the furnace. The schematic diagram of the design results is shown in Figure 6.

Figure 6 shows that the shape of the gold furnace is complete after adding the design factor. In the process of image modeling design of the environmental protection gold furnace, the design requirements such as manufacturing process, cost, and product appearance are comprehensively considered. While focusing on product appearance modeling, we should also consider multiple perceptual images contained in the product appearance to meet the emotional needs of large user groups for the image modeling of the environmental protection golden furnace to the greatest extent. Therefore, the comprehensive consideration of multiple images is more in line with design thinking.

In order to further verify the effect and feasibility of the method in this paper, comparative experiments are designed. The image modeling design data of the environmental protection golden stove will have problems such as data loss, noise interference of the transmission channel, and digital synchronization, which will affect the accuracy of the image modeling design of the environmental protection golden stove. The bit error rate represents the index to measure the accuracy of the modeling design within the specified time. The smaller the bit error rate, the higher the efficiency of the modeling design and the better the performance.

The method in this paper can effectively realize the reliability control of the image modeling design of the environmental protection golden furnace. The effect of the modeling design is good, and the balance is strong. The bit error rate of the modeling design under different methods is detected. The methods in [5, 6] are compared with the methods in this paper. The comparison results are shown in Figure 7.

Figure 7 shows that comparing the methods in [5] with those in [6], the method selected in this paper has a low bit error rate in the image modeling design of the environmental protection gold furnace. The main reason is that this method designs the hierarchical analysis structure of image modeling of environmental protection gold furnace, realizes the analysis of image modeling factors of environmental protection gold furnace, obtains the load balance parameters of image modeling of the environmental protection gold furnace, and adopts the differentiation feature analysis method. The image modeling factor analysis and process control of the environmental protection golden stove help reduce the bit error rate to a certain extent. Based on this, the design thinking of image modeling of the environmental protection gold furnace based on factor analysis has a good effect.

5. Discussion

Taking the Suanni design as an example, it can be realized from the following aspects.

5.1. Proper Deletion of Modern Decorative Elements. The image design from the traditional lynx to the

TABLE 2: Eigenvalues and contribution rate of correlation coefficient matrix.

Common factor	Characteristic value	Factor contribution rate (%)	Cumulative variance contribution rate (%)
X1	3.521	8.185	8.185
X2	4.185	8.679	16.864
X3	3.054	8.032	24.896
X4	5.945	9.517	34.413
X5	0.654	6.352	40.765
X6	2.845	7.854	48.619
X7	1.625	7.564	56.183
X8	1.425	7.165	63.348
X9	0.894	6.584	69.932
X10	0.987	6.984	76.916

TABLE 3: Strong correlation design factor analysis results.

Serial number	Rule	Confidence
1	X1, X3 \rightarrow X7	0.985
2	X2, X4 \rightarrow X6	0.953
3	X3, X4 \rightarrow X6	0.934
4	X2, X6 \rightarrow X7	0.921
5	X7, X8 \rightarrow X6	0.911



FIGURE 6: Finished product drawing of gold furnace modeling design.

environmental protection golden stove retains the traditional element characteristics of the lynx, but at the same time, it also adds some parts and finally integrates into an image design with modern trend characteristics and rich details of traditional creation methods. Among them, the most obvious ones are chains and bells that hang from the eyebrows and extend to the beard. The addition of these decorative elements adds a metallic feel to the image of the environmentally friendly gold stove. The curves and movements of the two chains on the lion's head are not purely symmetrical, and the angle of the bell and the tassel also changes slightly, as if swinging to one side.

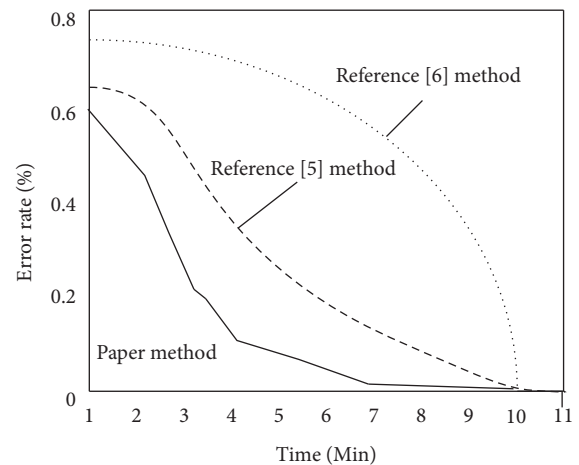


FIGURE 7: Comparison results of the bit error rate.

Lotus addition is balanced up and down by the spread of the beard underneath, making the pattern clumpy. The tongue stud, eyebrow stud, and other accessories are hip-hop elements to make the lion more playful. There are many replacement decorative elements in the image modeling of the environmental protection gold furnace, such as replacing the traditional Suanni sole horn with a duck hat, which is full of modern breath. The "sky eye" is used to replace the mirror between the eyebrows, ingeniously filling the spare space in the round mirror. The English letters on the forehead replace the original traditional pattern to establish a perspective relationship in the plane, making the shape of the forehead more full. People identify that pompoms, tongue, and cheeks are identical decors and drooping whiskers. On the basis of not affecting the recognition of the traditional lynx, it also made a slight deletion, which made the image modeling design of the environmental protection golden stove not always add innovation, but also appropriately deleted the complicated details, making the visual effect lighter and more agile.

5.2. From "Heart" to "Rational" Color Design. Color has the power to take the lead. The psychology that people of different ages or sexes produce of color differs. The color design

of the brand image is an important visual element to convey brand connotation, form recognition, and establish a public image. The color of HEA Suanni is mainly red, yellow, and orange. Among them, the white fluffy part has shown the most anterior and dynamic organ shape of eyes and mouth, which can express the charm, and has highlighted the lion's facial features covered by the fluffy. The black contour line is the border line that divides the large surface and distinguishes the facial features. From the color combination of facial features, accessories, and whole blocks in the image modeling of the environmental protection gold stove, through the extraction of the RGB value of color, put color coordinates into the relevant conclusion: red, yellow, and orange with the largest face area constituting a "vigorous" sense of spirit. Decorative red, yellow, and orange accessories form an "active, strong" sense of movement. The eye color of the red, black, and yellow composition is a "dynamic, enterprising" temperament. The mouth ministry that the orange, black, and red tricolor forms has an "energetic" spark. These seemingly "heart" and casual use of colors are important elements that reflect the brand's young and energetic positioning. Through rational color screening, the visual effect is harmonious and unified but does not lose its level; it vividly and intuitively conveys the brand spirit.

5.3. Creation of Lines of Spatial Dimension. The image of the environmental protection gold furnace imitates the knife marks of woodcut prints on the lines. Among them, the stop and turn of the square and square are just right. Both ends of the lines show the trend of picking on the thin and thin, and the middle is flat and powerful, with no lack of virtual and real changes, so that the image of the lion breaks away from the monotonous, rigid, and stiff alienation. Through the arrangement of different thicknesses and densities, the lines create a sense of spatial hierarchy and dimensional change of the facial features in the two-dimensional plane. The thick lines and small color blocks regularly arranged around the nose form a backward and weakened visual perception. The smooth edges erase the overly realistic sense of fuzz. The eyes and mouth should use long lines to outline and describe in order to form a large structural division and then use a dense and appropriate line arrangement to make the Suanni facial expression more prominent and present in the front as the visual center. Other accessories are relatively weak, forming a scattered space, which makes the image of the environmental protection gold furnace richer and more interesting.

6. Conclusion

Through the extraction, comparative analysis, and sorting out of the image modeling factors of the environmental protection gold furnace, the detailed characteristics of the pattern on the environmental protection gold furnace can be expressed through exaggeration and personification in the design to express the vivid and artistic spirit of the image. By integrating methods, "take the essence of traditional culture, (and) remove its elaborate secondary decoration" appropriately into the modern decorative elements, forming a

combination of new and old designs. Using colors that highlight cultural characteristics and form brand memory points to design in order to form the visual guide of the image. The use of lines with virtual, real, dense, and varying lengths creates the depth of spatial levels in visual language, enriching the original two-dimensional plane design dimension. The research shows that the error rate of the design method is low, and the design thinking of image modeling of the environmental protection gold furnace based on the factor analysis method has a good effect.

The above research has achieved certain results, and the following aspects can be further explored in the next research:

- (1) Data visualization is an important way of presenting data information. In the process of the visual practice of image modeling of the environmental protection golden furnace, we should consider the characteristics of data and the psychological needs of the audience and build a visual level based on the efficiency of information transmission, which can be studied in depth.
- (2) The application of visual elements in the visualization of image modeling data of the environmental protection golden furnace can be combined with various theories.
- (3) The data age is the leading trend of current and future social development. Under this trend, the design of image modeling of the environmental protection golden furnace should also follow the trend of the times, inject new content of the new era, and develop it forward.

Data Availability

The raw data supporting the conclusions of this article will be made available from the author, without undue reservation.

Conflicts of Interest

The author declares that they have no conflicts of interest regarding this work.

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