

# **The Research on Creative Design of Bai Architectural Decoration Patterns in Jianchuan Based on KANO Model Analysis**

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## **Abstract**

The objectives of this research were:1)Discover the relationship between decorative cultural and creative design elements of Jianchuan Bai folk houses and user satisfaction; 2) Compare the design priorities of the attributes of decorative cultural creative design elements of Jianchuan Bai folk houses;3) Propose creative design of decorative patterns for Bai folk houses in Jianchuan Methods and product application scenarios.

the sample was interviewed by Jianchuan craftsmen, designers and travelers in the Dali area. They were selected by Questionnaire Star collected 103 valid questionnaires, the research instrument for the data collection were KONO Model .

The research results were found as traditional architectural decoration is transformed into user needs of modern design products:1) The priority of the design elements of Jianchuan Bai folk house decoration cultural creative products is "the product is portable" > "the product embodies the expanded application of Jianchuan Bai folk house decoration function" > "the product has connotation and meaning " > "Products embody regional characteristics" > "Products embody regional auspicious culture" > "Products embody regional decorative patterns" > "Products embody regional cultural themes" ;2) The factors of "regional characteristic patterns" are attractive attributes and "regional characteristics auspicious meanings" The "factor" is the desired attribute, and the "function expansion" factor is the necessary attribute.3) Regional characteristics affect consumers' purchasing judgment. Based on this, the researchers established the sample extraction scope and product functional uses for creative pattern design.

The research results will provide evidence-based reference for the Jianchuan Bai folk residential decoration culture to propose creative design solutions that can meet the needs of contemporary users, and contribute a small amount to drive the development of local cultural industries and promote the revitalization of local traditional culture.

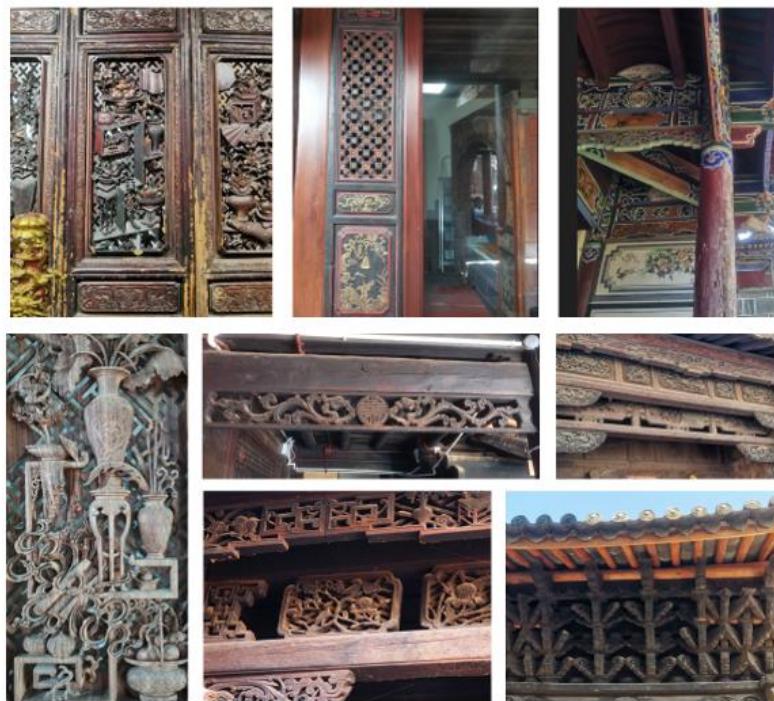
**Keywords:** Bai nationality; architectural decoration; pattern creative design

## **Introduction**

The architectural decorative patterns of the Bai ethnic group inherit the traditional Chinese architectural decorative pattern system and are also important ethnic minority artistic and cultural heritage(Figure1). Many cultural heritage projects have cultural capital that can be converted into resource value. The exploration of traditional residential decoration culture has inspired the expression of modern design, providing rich inspiration and innovation for modern design. To a certain extent, it also enhances people's awareness and confidence in local culture.

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**Figure 1** Structure of traditional wooden houses in Jianchuan area  
of Dali Source: Author, 2024

In recent years, more and more scholars have recognized the market value of traditional culture as cultural capital and recognized the positive role of creative design in the inheritance of traditional culture. Museum cultural creation represented by the Forbidden City Cultural Creativity that has emerged in various places has played an important role in the protection and revitalization of traditional culture. Exploitation provides a sample of success. In addition, some scholars have introduced quantitative research methods to study user needs of cultural and creative products, such as the research on the design of cultural and creative products for Dujiangyan Water Cultural Heritage (Huang, 2023 : 173-175.), Cultural and creative product design of "Guizhou Silk Road" casual gift (Zhang, 2019), Innovative design of Miao batik APP (Yang, 2023),etc. Scholars apply data analysis methods such as AHP and Kano in the research on the development of regional traditional cultural and creative products, which makes the development and design process of cultural and creative products more scientific and rational. However, it is a pity that the rich ethnic cultural resources in western Yunnan have been ignored by researchers due to transportation lag, geographical remoteness and other reasons. The research literature that can be retrieved so far is significantly less than that in the eastern provinces in terms of quantity and practical cases. This study is in line with the research trend. and market demand.

The study explores the protection and creative design of Bai folk residential decoration culture, uses the KONO model to explore users' needs for transforming traditional architectural decoration into modern design products, and uses quantitative analysis methods to discover the priority sequence of design elements, which provides researchers with "can improve user satisfaction" The "Jianchuan Bai folk house decoration cultural and creative products" provided

the basis for creation. Contribute a small amount to drive the development of local cultural industries and promote the revitalization of local traditional culture.

## Research Objectives

- (1) To Discover the relationship between the decorative cultural creative design elements of Jianchuan Bai folk houses and user satisfaction.
- (2) To Compare the design priorities of the attributes of decorative cultural and creative design elements of Bai folk residences in Jianchuan.
- (3) To Propose creative design methods and product application plans for decorative patterns of Bai folk houses in Jianchuan.

## Research Methodology

- (1) Research methods: Use questionnaire survey method and Kano model to observe the respondents' cognition and demand satisfaction of Jianchuan Bai folk residential decoration culture, and explore the relationship between design elements and user satisfaction.
- (2) Research sample group: The survey respondents conducted sample interviews with a total of 130 craftsmen, designers and travelers in the Dali area, and recovered 103 valid questionnaires.
- (3) Research tools: A questionnaire survey was used to find out the respondents' awareness and consumption expectations of "Jianchuan Bai folk residential decoration culture". The Kano model was used to discover the relationship between respondent satisfaction and design elements. Use Better and Worse values to discover the respondents' sensitivity to design elements and prioritize the design elements under each attribute.
- (4) Analysis of research results

The research results show that the important factor that affects consumers' purchasing judgment is whether the product has regional characteristics. Users prioritize the design elements of Jianchuan Bai folk house decoration cultural creative products as "the product is portable" > "the product embodies the Jianchuan Bai folk house" Expanded application of decorative functions" > "Products have connotative meanings" > "Products reflect regional characteristics" > "Products reflect regional auspicious culture" > "Products reflect regional decorative patterns" > "Products reflect regional cultural themes", among which "regional characteristic patterns" The "factor" is the charm attribute, the "regional characteristics and auspicious meaning" factor is the desired attribute, and the "functional expansion" factor is the necessary attribute. The symbol extraction scope and product functional uses of the researcher's pattern creative design were established.

## Research Results

The survey on the decorative cultural creative design elements and user satisfaction of the Bai folk houses in Jianchuan was conducted through interviews and questionnaires. The population samples of the sampled data mainly came from the Jianchuan area, including local craftsmen, practitioners, and tourists. The survey was also conducted through online contacts. A group of designers and professionals are interested in this issue.

A total of 130 people were surveyed, and 103 valid questionnaires were collected. Overall, the gender distribution of the respondents is balanced, with 56.31% males and 43.69%

females; the age group is mainly concentrated between 18 and 50 years old, including 12.62% under 18 years old and 14.56% between 18 and 25 years old. 29.13% are 26-36 years old, 27.18% are 37-50 years old, and 16.5% are over 50 years old. The educational level is comprehensive, with more college students. 55.34% of the survey respondents are from Dali Bai Autonomous Prefecture, and 44.66% are from other regions. The population structure is reasonable, with 25.24% being designers and related professionals, 27.18% being local craftsmen and related practitioners, and 45.57% being consumer groups who will purchase related products.

1. Identification of cultural and creative design elements and attributes of Bai folk residences in Jianchuan based on user satisfaction.

### 1.1. Reliability and validity analysis:

As shown in Table 1, The reliability coefficient value of the questionnaire is 0.827, which is greater than 0.8, indicating that the research data has high reliability and quality and can be used for further analysis (Table 1). After any item is deleted, the reliability coefficient will not increase significantly, so it means that the item should not be deleted.

**Table 1** Cronbach Reliability Analysis-Simplified Format

No.	sample size	Cronbach alpha coefficient
26	103	0.827

As shown in Table 2, The study used KMO and Bartlett tests for validity verification. The data showed that the variance explanation rates of the six factors were 20.693%, 17.194%, 13.492%, 7.095%, 6.762%, and 6.383% respectively. The cumulative variance explanation rate after rotation was 71.618% > 50%. It means that the amount of information of the research item can be effectively extracted. The KMO value is 0.806, and the KMO value is greater than 0.8, which reflects the validity from the side and the research data is very suitable for extracting information (Table 2).

**Table 2** Validity analysis results

	KMO value	0.806
Bartlett's test of sphericity	Approximate chi square	1601.017
	df	325
	p-value	0.000

### 1.2 Extraction and attribute identification of design elements

The study uses the Kano model to help designers determine the priority of user needs, analyze the attributes and priority distribution of design elements, screen design elements, and propose a priority sequence of design elements that can improve user product satisfaction, providing cultural and creative ideas for Bai folk residence decoration in Jianchuan Provide creative basis for product design.

#### 1.2.1 Design questionnaire

The Kano model is a two-dimensional cognitive model proposed by Noriaki Kano, a professor at Tokyo Institute of Technology, in 1984 based on Herzberg's two-factor theory to analyze users' satisfaction with a certain quality factor and their demand for quality factors

(Kano, 1984 : 147-156.). As shown in Table 3, Questions are asked from two aspects: positive questions and negative questions. The cross-summarization between the options of positive questions and negative questions will get six attributes: attractive attributes (A), basic attributes (M), and expectations. Attribute (O), indifference attribute (I), reverse attribute (R), questionable attribute (Q) (Table 3). The Kano model is often used to solve product attribute positioning problems and improve customer satisfaction. It is also used in product research and development and other fields, and is one of the important tools used to improve user satisfaction.

**Table 3** KANO model evaluation results classification comparison table

Features / Services	negative question				
	Not satisfied (1 point)	Can bear it (2 points)	It doesn't matter (3 points)	It should be so (4 points)	Satisfied (5 points)
forward question	Not satisfied (1 point)	Q	R	R	R
	Can bear it (2 points)	M	I	I	R
	It doesn't matter (3 points)	M	I	I	R
	It should be so (4 points)	M	I	I	R
	Satisfied (5 points)	O	A	A	Q

A: Charm attribute, O: expected attribute, M: essential attribute, I: no difference attribute, R: reverse attribute, Q: suspicious attribute

The questionnaire has 13 dual-factor questions, As shown in Table 4, questions 1-7 are based on "regional cultural characteristics", "material texture", "design creativity", "connotation", "use function", "commemorative significance", "carrying" "Convenience" factor was used to observe the functional needs and quality expectations of respondents for Jianchuan Bai folk residential decoration cultural creative design products. Questions 8-13 were analyzed through "cultural characteristics", "decorative patterns", "color characteristics", "auspicious meaning", The factors of "expanded functions" and "craft characteristics" were used to understand the respondents' views on the design elements of Jianchuan Bai folk residential decoration cultural and creative products. The questionnaire questions are as follows(Table 4):

**Table 4** Questionnaire list

NO.	Questionnaire questions
1	When you do not have "regional cultural characteristics" you will & When you have "regional cultural characteristics" you will
2	When you don't have "material texture" you will & When you have "material texture" you will
3	When you don't have "design creativity" you will & when you have "design creativity" you will
4	When you don't have "connotative meaning" you will & When you have "connotative meaning" you will
5	When you don't have "useful functions" you will & When you have "useful functions" you will
6	What will you do when it is not of "memorable significance" & what will you do when it is of "commemorative significance"
7	When you do not have the "portability feature" you will & When you have the "portability feature" you will
8	It does not have the unique decorative "cultural characteristics" of the Bai people's residences in Jianchuan. Your evaluation is "yes". It has the unique "cultural characteristics" of the Bai people's residences in Jianchuan. Your evaluation is "yes".
9	If you don't have the "decorative patterns" of Jianchuan Bai folk houses, your rating is yes & if you have the "decorative patterns" of Jianchuan Bai folk houses, your rating is yes
10	It does not have the "color characteristics" of Jianchuan Bai folk house decoration. Your evaluation is "Yes". It has the "color characteristics" of Jianchuan Bai folk house decoration. Your evaluation is "Yes".
11	It does not have the "auspicious meaning characteristics" of Jianchuan Bai folk house decoration. Your evaluation is "Yes". It has "auspicious meaning characteristics" of Jianchuan Bai folk house decoration. Your evaluation is "Yes".
12	When it does not have "expanded functions", your evaluation is yes & when it has "expanded functions", your evaluation is yes
13	If the Jianchuan Bai folk house decoration does not have the "craft characteristics" of the decoration, your evaluation is "Yes"; if the Jianchuan Bai folk house decoration has the "technological characteristics" of the Jianchuan Bai folk house decoration, your evaluation is "Yes"

The evaluation options are five dimensions: "dissatisfied, bearable, indifferent, as it should be, and satisfied", with 1, 2, 3, 4, and 5 points respectively set to measure the impact of the design element on user satisfaction. Get attribute tips through cross-summarization of positive and negative question options. When the conclusion prompts "charming attributes", it means that the degree of perfection of this item is high and user satisfaction will increase significantly. However, if there is no such item, the decrease in user satisfaction is not obvious; when the conclusion prompts "expected attributes", the degree of perfection of this item is high and user satisfaction is high. The degree will increase, and if it is not available, user satisfaction

will decrease; when the conclusion prompts "Must-have attribute", it means that the degree of this item is high and the increase in user satisfaction will not be obvious, but if there is no such item, user satisfaction will decrease significantly; it prompts "None" When "differential attribute" is displayed, it means that there is no obvious relationship between this item and satisfaction; when "reverse attribute" is displayed, it means that user satisfaction will decrease when the degree of perfection of this item is high. The attribute characteristics derived from KANO model diagrams can help designers accurately locate product attributes for product design, thereby effectively improving user satisfaction with the product.

### 1.2.2. Identify the attributes of the design elements

Table 5 Summary table of KANO model analysis results

NO.	Features / Services	A	O	M	I	R	Q	Classification results
1	Does not have the "easy to carry" feature & has the feature of "easy to carry"	15.0 0%	20.0 0%	32.0 0%	31.0 0%	1.0 0%	1.0 0%	Required attributes
2	Does not have "functional expansion" & has "functional expansion"	12.0 0%	10.0 0%	39.0 0%	35.0 0%	3.0 0%	1.0 0%	Required attributes
3	Does not have "connotative meaning" & has "connotation" & Has the "connotation and implied meaning"	12.0 0%	45.0 0%	13.0 0%	29.0 0%	0.0 0%	1.0 0%	Expected properties
4	Does not have "regional characteristics" & Has "regional characteristics"	12.0 0%	37.0 0%	14.0 0%	36.0 0%	0.0 0%	1.0 0%	Expected properties
5	Does not have the "auspicious culture" of Jianchuan Bai folk house decoration & has the "auspicious culture" of Jianchuan Bai folk house decoration	11.0 0%	33.0 0%	21.0 0%	32.0 0%	2.0 0%	1.0 0%	Expected properties
6	Does not have the "decorative patterns" of Bai folk houses in Jianchuan & It has the "decorative patterns" of Bai folk houses in Jianchuan	29.0 0%	25.0 0%	16.0 0%	28.0 0%	1.0 0%	1.0 0%	Charm attributes
7	Does not have the "cultural theme" characteristics of Jianchuan Bai folk house decoration & has the "cultural theme" characteristics of Jianchuan Bai folk house decoration	32.0 0%	21.0 0%	14.0 0%	31.0 0%	1.0 0%	1.0 0%	Charm attributes
8	Does not have "material texture" & has "material texture"	10.0 0%	25.0 0%	23.0 0%	40.0 0%	1.0 0%	1.0 0%	Indifferent property
9	Not possessing "design creativity" & Possess "design creativity"	10.0 0%	24.0 0%	28.0 0%	36.0 0%	1.0 0%	1.0 0%	Indifferent property
10	Does not have "practical functions" & has "practical functions"	3.00 %	13.0 %	37.0 %	46.0 %	0.0 0%	1.0 0%	Indifferent property
11	Not of "memorable significance" & has "memorable significance"	5.00 %	9.00 %	35.0 %	50.0 %	0.0 0%	1.0 0%	Indifferent property
12	Does not have the "color characteristics" of Jianchuan Bai folk house decoration & Has the "color characteristics" of Bai folk residence decoration in Jianchuan	9.00 %	7.00 %	14.0 %	62.0 %	7.0 0%	1.0 0%	Indifferent property

13	Does not have the "craft characteristics" of Jianchuan Bai folk house decoration & has the "craft characteristics" of Jianchuan Bai folk house decoration	7.00	15.0	28.0	47.0	2.0	1.0	indifferenc
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The evaluation of attributes is helpful to understand the respondents' needs and expectations for the product, thereby improving the quality and competitiveness of the product. Each function is analyzed item by item based on the KANO model data, As shown in Table 5:

Design element 7, "Will the product have "portability features" affect your consumption decision?" The survey data shows that "portability features" are a must-have attribute. Indicates that most users believe that portability of the product is necessary. The Better coefficient is 36.63% and the Worse coefficient is -53.47%. The Better coefficient is higher, indicating that improving this function will improve user satisfaction; the Worse coefficient is higher, indicating that if the product does not have this function, user satisfaction will be significantly reduced.

Design element 12, "What do you think of the product's 'functional use' expanding the decorative extension of Jianchuan Bai folk residences?" The survey data shows that this element is a necessary attribute, indicating that the interviewees believe that the expansion of the product's functional use is necessary. Both the Better coefficient and the Worse coefficient are relatively low, indicating that users are less sensitive to this function.

Design element 4, "Will the product have "connotative meaning" affect your consumption decision?" The survey data shows that this element is a desired attribute, and the respondents hope that the product has connotative meaning. Both the Better coefficient and the Worse coefficient are high, indicating that users are very sensitive to this function, and whether the product has this function or not has a greater impact on user satisfaction.

Design element 1, "Whether a product has 'regional cultural characteristics' will affect your consumption decision?" The survey data shows that this element is a desired attribute, and users hope that products have regional cultural characteristics. Both the Better coefficient and the Worse coefficient are high, indicating that users are more sensitive to this function.

Design element 11, "What do you think of the product's 'cultural connotation' having the auspicious meaning of Jianchuan Bai folk house decoration culture?" The survey data shows that this element is a desired attribute, and the respondents hope that the product has cultural connotation. However, both the Better coefficient and the Worse coefficient are relatively low, indicating that users are less sensitive to this function.

Design element 9, "What do you think of the product's 'decorative elements' adopting the patterns used in the decoration of Bai folk houses in Jianchuan?" The survey data shows that this element is an attractive attribute, and the interviewees hope that products with certain decorative elements will increase users' interest. Satisfaction. The Better coefficient is higher, indicating that improving this function will improve user satisfaction; the Worse coefficient is also higher, indicating that if this function is not available, user satisfaction will be significantly reduced.

Design element 8, "What do you think of the unique decorative culture of Jianchuan Bai folk houses presented in the 'theme type' of the product?" The survey data shows that this element is an attractive attribute. Respondents said that the unique decorative culture of the product's theme type will increase the number of users. of satisfaction. Both the Better

coefficient and the Worse coefficient are high, indicating that users are more sensitive to this function.

Design element 3, "Will a product have 'creative design' affect your consumption decision?" The survey data shows that this element is an indifferent attribute, indicating that most respondents are not highly sensitive to this feature. Both the Better coefficient and the Worse coefficient are high, but the difference is not large, indicating that users have a neutral attitude toward this feature.

Design element 2, "Will a product have a 'material texture' affect your consumption decision?" The survey data shows that this element is an indifferent attribute, indicating that most respondents have a neutral attitude towards whether a product has a material texture. Both the Better coefficient and the Worse coefficient are low, indicating that users are less sensitive to this function.

Design element 13, "What do you think of the product's 'expression technique' having the characteristics of Jianchuan Bai folk house decoration craftsmanship?" The survey data shows that this element is an indifferent attribute, indicating that most respondents are not highly sensitive to this function. Both the Better coefficient and the Worse coefficient are relatively low, indicating that users are less sensitive to this function.

2. Design priority levels of the attributes of decorative cultural and creative design elements of Bai folk houses in Jianchuan

#### 2.1. Screening of design elements

Combining the KANO model theory's elaboration of the five attributes of elements, it can be concluded that the design elements that need to be retained are essential attributes (M), expected attributes (O), and attractive attributes (A). These elements can make users more satisfied with the product. Strong improvement effect, while indifference elements (I) and reverse elements (R) have no significant effect in improving user satisfaction, or even reduce user satisfaction, so they are eliminated in the screening process of later design strategy formulation. Therefore, the design elements selected in this survey include: easy to carry, expanded functions, connotative meaning, reflecting regional characteristics, reflecting regional auspicious culture, using regional decorative patterns, and using regional cultural themes. These elements will be applied in later design practice. The design elements that need to be retained are as shown in Table 6:

Table 6 List of selected design elements

Classification of quality elements	NO.	Design elements
Required attributes (M)	7	Easy to carry
	12	Functional expansion
Expected properties (O)	4	Connotation and meaning
	1	Regional characteristics
Charm Attribute (A)	11	Regional auspicious culture
	9	Area decorative pattern
	8	Regional cultural themes

## 2.2 Ranking of importance of design elements

Design requirement user satisfaction index calculation Based on the classification results of each design requirement attribute in Table 5 , the satisfaction index of each design requirement user is calculated. Here we will use the Better-Worse coefficient calculation method proposed by scholar Berger . The calculation formula is as follows:.

$$\text{Better}=(A+O)/(A+O+M+I) \quad (1)$$

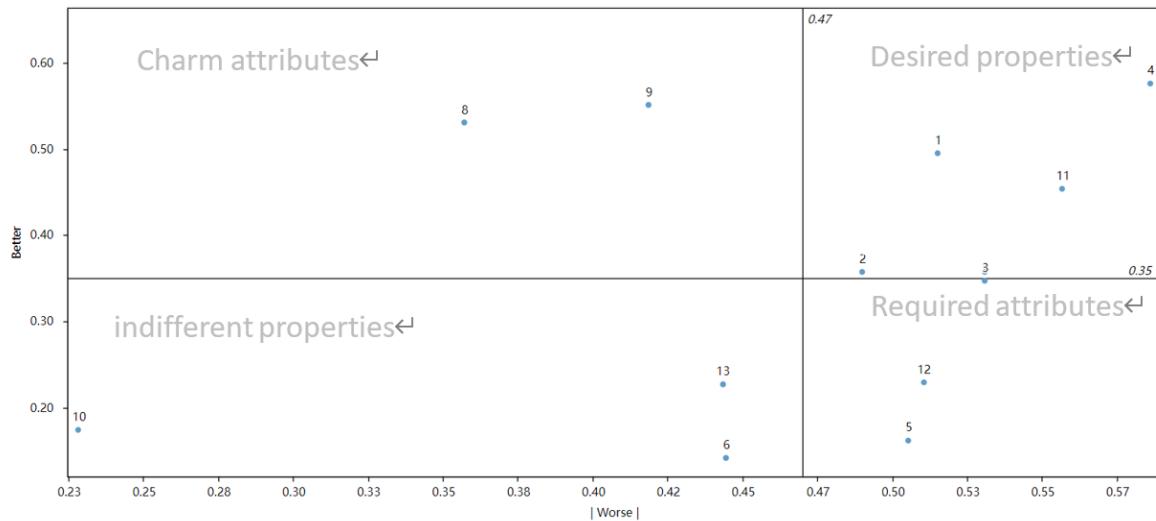
$$\text{Worse}=(O+M)/(A+O+M+I) \times (-1) \quad (2)$$

Among them, the index and ranking satisfaction results are shown in the Table 7.

Table 7 Design element prioritization table

Classification of design elements	NO.	Design elements	Better(X)	Worse(Y)	average value	priority
Required attributes (M)	7	Easy to carry	0.531	0.357	0.444	1
	12	Functional expansion	0.510	0.229	0.369	2
Expected properties (O)	4	Connotation and meaning	0.586	0.576	0.581	3
	1	Regional characteristics	0.515	0.495	0.505	4
Charm Attribute (A)	11	Regional auspicious culture	0.557	0.454	0.505	5
	9	Area decorative pattern	0.418	0.551	0.484	6
	8	Regional cultural themes	0.357	0.531	0.444	7

Draw a quartile quadrant chart based on the absolute value of the Better-Worse sensitivity coefficient(Figure 2). The Better value is the ordinate (X) and the Worse value is the abscissa (Y). Further prioritize the elements and analyze the attributes and priorities of the design elements. Distribution.



**Figure 2** Interquartile diagram of design elements  
Source: Survey data from the investigators (January 2024)

As shown in Figure 2, The first quadrant is the desired attributes, the second quadrant is the attractive attributes, the third quadrant is the indifferent attributes, and the fourth quadrant is the necessary attributes. In the ranking of product features, the priority order usually needs to be: necessary attributes > expected attributes > attractive attributes > indifference attributes.

In the same attribute, the higher the Better value, the greater the impact on the respondents and the higher the priority. As shown in Table 6, It can be seen that the priority of the design elements of Jianchuan Bai folk house decoration cultural and creative products is: 7>12>4>1>11>9>8, that is, "the product is portable" > "the product embodies the Jianchuan Bai folk house decoration" Expanded application of functions" > "The product has connotation and meaning" > "The product reflects regional characteristics" > "The product reflects regional auspicious culture" > "The product reflects regional decorative patterns" > "The product reflects regional cultural themes".

### 2.3. Importance weight of design elements

The researcher observed various factor indicators of the "relationship between design elements and user satisfaction", and used AHP to calculate the weight to score the importance of various indicators of the decoration of Bai folk houses in Jianchuan again. Among them, the greater the average value, the higher the importance and the higher the weight, and the CR value was finally calculated as  $0.000 < 0.1$ . It means that the judgment matrix of this study meets the consistency test, and the calculated weights are consistent, As shown in Table 8 .

**Table 8** AHP hierarchical analysis results

Project	eigenvector	weighted value	eigenvalue of maximum	ct value
Jianchuan Bai folk house decoration pattern your evaluation is	1.111	22.211%		
There are the color characteristics of Jianchuan Bai folk house decoration that you evaluate is	0.908	18.154%		
There are auspicious moral characteristics of Jianchuan Bai folk house decoration, your evaluation is	1.060	21.197%	5.000	0.000
Have features to expand when you rate is	0.963	19.270%		
Jianchuan Bai folk house decoration process features your evaluation is	0.958	19.168%		

The CI values in the table above are used for the following conformance checks.

After confirming that all the data passed the consistency test, the researchers sorted out the index weights of the criterion layer. The research data show that: "with Jianchuan Bai folk house decoration patterns" has the highest weight value, in the KANO model analysis, this option is the charm attribute, "with Jianchuan Bai folk house decoration auspicious meaning culture" has the second weight value, in the KANO model analysis, this option is the expectation attribute, designers will focus on the application of this index factor in the design of creative products. The two indicators with the lowest weight are "with decorative technology characteristics of Jianchuan Bai folk houses" and "with decorative color characteristics of Jianchuan Bai folk houses", which are the non-difference attributes in KANO model analysis. The researchers should focus on the two aspects of "Jianchuan Bai folk house decoration pattern" and "Jianchuan Bai folk house decoration auspicious meaning culture" to study the design elements of the graphic pattern. As shown in Table 9.

**Table 9** AHP hierarchical analysis judgment matrix

aver age valu e	Project	There are Jianchu an Bai folk house decorati on patterns	Jianchuan Bai folk house decoration auspicious meaning of culture	The func tion is expa nde d	Jianchua n Bai folk house decoratio n technolog y features	There are decorative color characte ristics of Jianchuan Bai folk houses	attri bute
4.38	There are Jianchuan Bai folk house decoration patterns	1	1.048	1.15 3	1.159	1.223	Char m attri bute
4.18	Jianchuan Bai folk house decoration auspicious	0.954	1	1.1	1.106	1.168	Exp ecte d attri bute

meaning of culture							Essential attribute Indifference attribute
3.8	The function is expanded	0.868	0.909	1	1.005	1.061	
3.78	Jianchuan Bai folk house decoration technology features There are decorative color characteristics of Jianchuan Bai folk houses	0.863	0.904	0.995	1	1.056	Indifference attribute
3.58		0.817	0.856	0.942	0.947	1	Indifference attribute

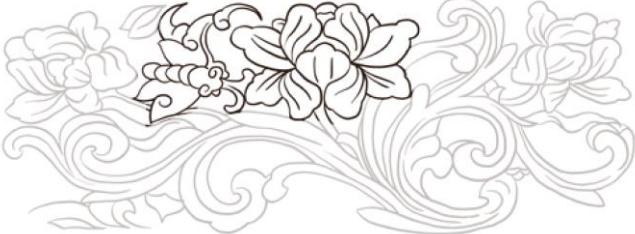
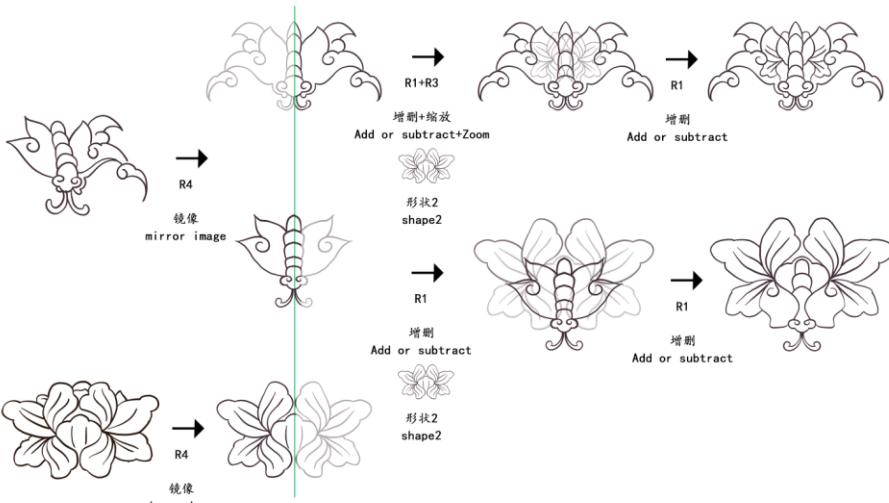
### 3. Creative design methods and product application plans for decorative patterns of Bai folk houses in Jianchuan

In order to keep the cultural creative products can reflect the regional characteristics, the researchers mainly extracted materials from the decorative patterns of Bai folk houses in Jianchuan. The results of the survey on the relationship between design elements and user satisfaction show that consumers believe that the charm attribute "pattern", the expectation attribute "auspicious meaning" and the essential attribute "function expansion" are important factors affecting consumers' purchase judgment. This conclusion establishes the focus range of researchers' extraction of regional characteristic cultural symbols.

The study of regional visual characteristics focuses on these index elements, and focuses on mining traditional architectural decorative patterns with local characteristics from the building gates, doors and Windows, and adopts shape grammar rules to regenerate and reorganize decorative samples. Taking a group of peony patterns as an example, in the pattern regeneration and reorganization of the next group, the researcher uses mirror image (R4) to mirror the target sample, making it look symmetrical and standardized, and then enriches the line language of the target pattern by adding and deleting (R1), scaling (R3) and other rules. Finally, the redundant lines of (R1) are deleted to obtain a completed new figure. The new pattern created by grammar rules can not only preserve the cultural factors and perceptual intention of the target sample, but also promote the contemporary innovation of traditional cultural elements. As shown in Table 10, Table 11:

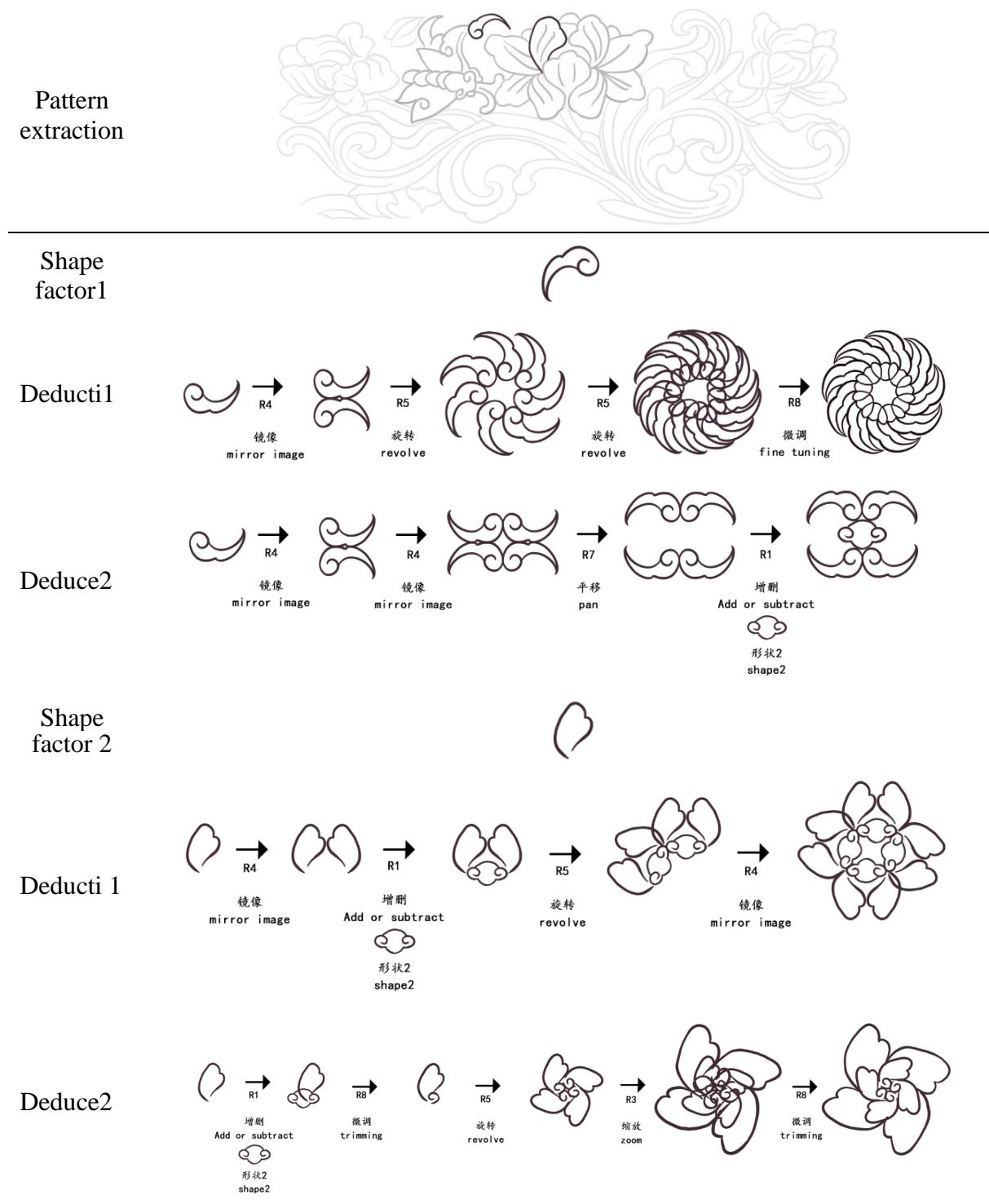
Table 10 Regeneration and recombination of the pattern

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Sample 1 (hibiscus flower)	
Pattern extraction	
Deducti1	
Deduce2	

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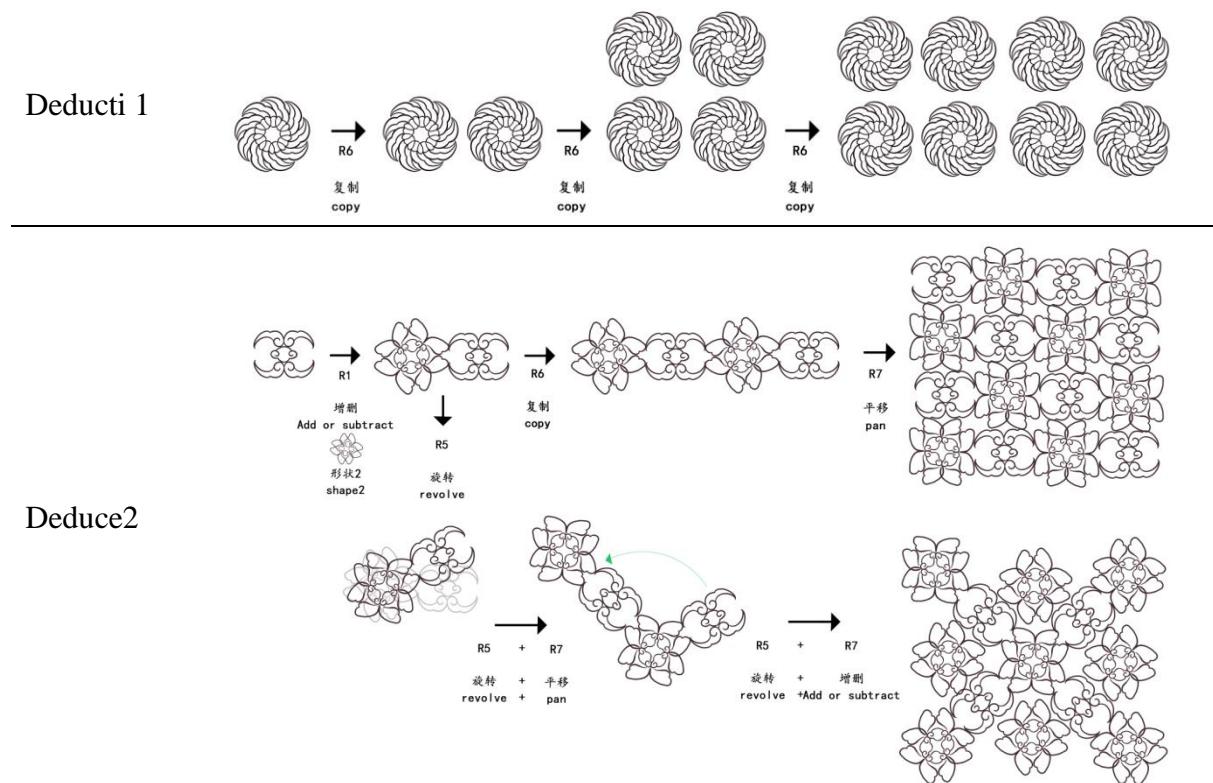
**Table 11** Generative deduction of the shape grammar



Source: Author

Shape grammar can not only be applied to form factors, but also can be used to generate rich changes in the generated graphics, which look more mechanical, regular, industrial visual aesthetic effect, As shown in Table 12:

**Table 12** Derivative deduction of the shape grammar



Source: Author

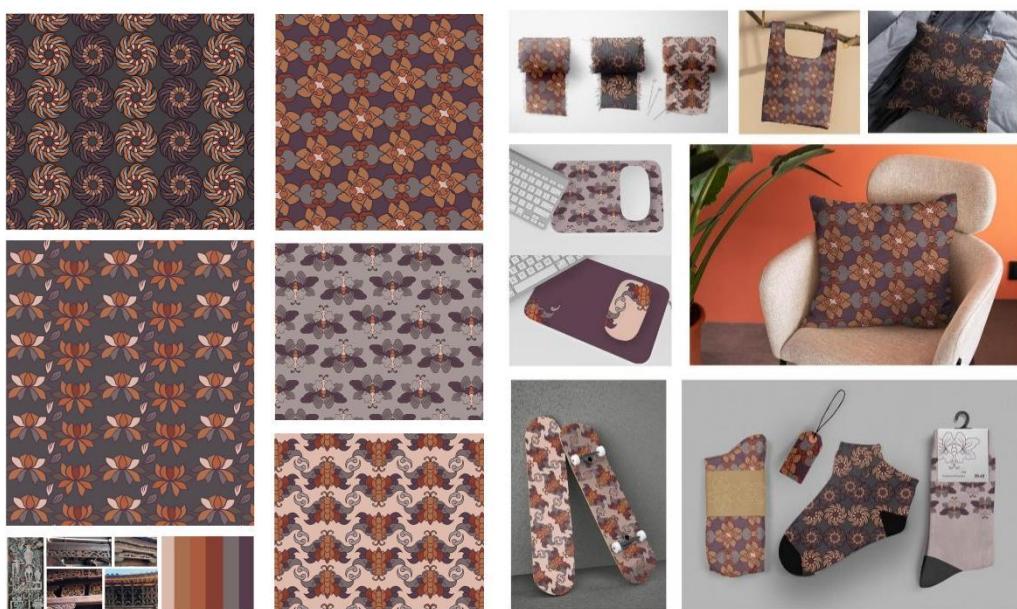
The researchers extracted the colors from the photos of Bai architectural decorations in Jianchuan, and obtained the specific parameters of the color factors through Photoshop software, so as to reserve the reference for the pattern color matching scheme and color perceptual intention for creative design. As shown in Table 13:

**Table 13** Color factor extraction

Architectural decoration sample pictures	Color extraction	color factor
		C:83 M:64 Y:73 K:33
		C:69 M:55 Y:49 K:1
		C:38 M:36 Y:29 K:0
		C:23 M:64 Y:43 K:0
		C:30 M:30 Y:45 K:0
		C:44 M:44 Y:92 K:0
		C:61 M:80 Y:69 K:31
		C:65 M:66 Y:64 K:15
		C:92 M:89 Y:53 K:24

Source: Author

Finally, by displaying the product application effects, the methods and approaches of the decorative cultural creative design of the Bai folk houses in Jianchuan are discussed. The researchers focused on decorative patterns for innovative design, and based on the conclusion of "The Relationship Between Decorative Cultural Creative Design Elements and User Satisfaction of Bai Folk Residences in Jianchuan", they sorted out product forms that meet the necessary attributes of "easy to carry" and "functional expansion", and selected The following carriers demonstrate the application prospects of pattern creative design results, demonstrate the charm derived from traditional culture, and propose achievable thinking methods and practical approaches for the design of traditional cultural creative products(Figure3).



**Figure 3** Innovative design and product application of decorative patterns

Source: Author, 2024

The application form of Jianchuan Bai folk residence decoration cultural and creative products is based on the conclusion of "The relationship between Jianchuan Bai folk house decoration cultural creative design elements and user satisfaction". The researchers conducted an analysis on the elements of "portability" and "functional expansion" that meet the necessary attributes. After sorting out the product forms, the following products were finally selected as carriers to complete the design of cultural and creative products for Bai folk residence decoration in Jianchuan.

The KANO model can help designers determine the priority of user needs, thereby effectively improving user satisfaction with products.

Research shows that among users' feedback on 13 attributes in the "Survey on Design Elements and User Satisfaction of Bai Folk House Decoration Cultural Creative Products in Jianchuan", the ones with high priority are mainly necessary attributes, desired attributes and attractive attributes. Among them, the necessary attributes include two design elements: "the product is portable" and "the product embodies the expanded application of decorative functions of Jianchuan Bai folk houses". If these two conditions are improved, the increase in user satisfaction with the product will not be obvious, but if there is no This item will significantly reduce user satisfaction with the product; The expected attributes include three design elements: "the product has connotative meaning", "the product reflects regional characteristics", and "the product reflects regional auspicious culture". If these three conditions are improved, user satisfaction with the product will increase. Moreover, without this , user satisfaction will decrease; Charming attributes include two design elements: "product embodies regional decorative patterns" and "product embodies regional cultural themes". When these two conditions are improved, user satisfaction with the product will increase significantly. However, without this item, user satisfaction will not decrease. Obviously, the remaining 6 items are indifferent attributes, indicating that users are not highly sensitive to these design elements.

Combined with the Better-Worse sensitivity coefficient, the priority of the design elements of Jianchuan Bai folk house decoration cultural and creative products can be more accurately sorted. The priority principle is: "The product is portable" > "The product embodies the decoration function of Jianchuan Bai folk house." Expand application" > "The product has connotation and meaning" > "The product reflects regional characteristics" > "The product reflects regional auspicious culture" > "The product reflects regional decorative patterns" > "The product reflects regional cultural themes". Based on this guide, we can carry out the design of creative cultural and creative products for Bai folk residences in Jianchuan that can improve user satisfaction.

Shape grammar helps researchers use rational thinking to analyze the mechanism of perceptual judgment, turning this thinking process into a process that can be replicated and restored. It can play a positive role in researching cultural creativity and derivative issues. Research uses grammatical rules to deduce The new form of traditional patterns not only preserves the cultural factors and perceptual intentions of the target samples, but also promotes contemporary innovation of traditional cultural elements. Effectively promote the contemporary inheritance and development of traditional culture.

## Discussion

Jianchuan Bai folk house decoration culture has the value of being converted into resources. The rich traditional decoration system presents a decorative art form with unique local characteristics. Two items recognized as intangible cultural heritage include Bai wood carving craftsmanship and Bai architectural construction skills. Consumers The market's recognition of the cultural value of Jianchuan Bai folk house decoration will make it a cultural and creative resource that can drive local cultural and economic development.

KANO theory analyzes user satisfaction with a certain quality factor and demand for quality factors through a two-dimensional cognitive model. It has advantages in solving the problem of product attribute positioning and helping researchers optimize design elements and improve customer satisfaction. It has been used in the field of product design. Has a wide range of applications.

Through consulting other relevant studies on the design of cultural heritage cultural and creative products based on the Kano model, some scholars have also reached similar conclusions. For example, in a study on the design of cultural and creative products for Jiangyan Culture, Huang Ting et al believe that: Paying attention to the cultural connotation of water in cultural and creative products should focus on the desirability demand, and being creative and portable should be considered when designing the cultural and creative products of Dujiangyan's water cultural heritage (Huang Ting, Zhang Jie, Yang Xin : 2023: 173-175.). According to the research report of scholar Zhang Ning, "highlighting cultural heritage", "attractive appearance color" and "easy portability" most need to be improved, and "easy portability" is the quality attribute that needs to be improved the most, followed by the attractiveness of "shape" and "color"(Zhang, 2019). These scholars discussed the design elements to improve user satisfaction from different cultural levels, and all tended to prioritize design factors such as "portability", "regional characteristic pattern" and "regional characteristic culture". Although different cultures and different groups led to some differences in conclusions, the overall direction was the same.

The success or failure of cultural and creative product design is closely linked to the demand dynamics of the consumer market, which forces researchers to make rational predictions about the functional attributes of the product. In this study, the researchers used the KANO theory to explore users' needs for the transformation of Jianchuan Bai folk house decoration culture into modern design products, and used quantitative analysis methods to discover the priority sequence of design elements, and based on this, provide solutions for Jianchuan Bai folk house decoration. The pattern proposes creative design ideas and application solutions that can meet the needs of contemporary users.

## Conclusion

The KANO model can help designers determine the priority of user needs, thereby effectively improving user satisfaction with products.

Research shows that among users' feedback on 13 attributes in the "Survey on Design Elements and User Satisfaction of Bai Folk House Decoration Cultural Creative Products in Jianchuan", the ones with high priority are mainly necessary attributes, desired attributes and attractive attributes. Among them, the necessary attributes include two design elements: "the product is portable" and "the product embodies the expanded application of decorative

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Shape grammar helps researchers use rational thinking to analyze the mechanism of perceptual judgment, turning this thinking process into a process that can be replicated and restored. It can play a positive role in researching cultural creativity and derivative issues. Research uses grammatical rules to deduce The new form of traditional patterns not only preserves the cultural factors and perceptual intentions of the target samples, but also promotes contemporary innovation of traditional cultural elements. Effectively promote the contemporary inheritance and development of traditional culture.

## Recommendations

1. KANO theory and analytic hierarchy process can play an effective supporting role in accurately identifying user groups and consumer needs. The analysis results show that designers should visually reflect regional auspicious culture, regional decorative patterns, and regional cultural themes in products. Functionally, it has the characteristics of portability and expansion, and culturally, it has connotation and reflects regional characteristics.Researchers should focus this design study on the two aspects of "Jianchuan Bai folk house decoration patterns" and "Jianchuan Bai folk house decoration auspicious meaning culture" to study the graphic patterns of design elements. The intervention of these factors will have a positive impact on product prices.

2. As a tool for studying innovative design of cultural factors, shape grammar rules promote the generation and derivation of new graphics into a rational and regular derivation process. Under the deduction of shape grammar rules, researchers can more logically obtain new graphics that not only reflect local characteristics but also conform to modern visual aesthetics.

The development of cultural and creative products can effectively enhance the application value of Jianchuan Bai folk house decoration cultural resources, making this lost traditional culture reappear in the eyes of consumers in the form needed for contemporary life. Product design makes people need and desire this culture again, thereby effectively activating the market value of traditional cultural resources and promoting the protection of traditional culture.

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