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Analysis of the Design Demand for Mongolian Embroidery Products from the Perspective of Cultural Empowerment

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Abstract

Taking Mongolian embroidery products as the research object, this study explores consumers' design needs for Mongolian embroidery products to enhance their overall satisfaction and cultural consumption demand for such products. The KJ-Kano integrated model was used to obtain specific design demand elements of consumers for Mongolian embroidery products, identifying must-be needs, one-dimensional needs, and attractive needs to clarify the optimization direction for product design. By analyzing the design demand elements of consumers for Mongolian embroidery products, the attributes of each demand element were classified and ranked. The design of Mongolian embroidery products needs to prioritize meeting must-be attributes such as rich colors and harmonious matching, highlight one-dimensional attributes such as fine craftsmanship and pure handmade production, integrate a modern sense of fashion, meet personalized design, and simultaneously focus on environmental protection and sustainable production. By accurately targeting specific groups, and enhancing brand influence through multi-channel marketing and cross-border cooperation, product competitiveness can be improved and cultural inheritance achieved.

Keywords: Kano model; Affinity diagram method; Mongolian embroidery; Consumer demand; Product design; Attribute classification

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1. Introduction

Mongolian embroidery has a long cultural history and has formed distinct regional "embroidery branches" such as Ordos, Ujimqin, and Urad during its historical evolution. Mongolian embroidery integrates the nomadic civilization traditions of the northern grasslands of China, (Tian. 2008) presenting an artistic style characterized by bold and even composition, bright colors, and rough embroidery work in terms of materials, patterns, and coloring methods. (Wu. 2019) Mongolian embroidery was included in the second batch of China's National Intangible Cultural Heritage List in 2008. However, traditional Mongolian embroidery is mostly handmade, and in the contemporary design context, it faces issues such as lack of innovation and single functionality, making it difficult to meet modern consumers' demands for personalized and diversified products. Therefore, how to promote the modern transformation of this traditional craft, preserving traditional culture while meeting contemporary aesthetic and practical needs, is an urgent problem to be solved.

The unique visual language and exquisite craftsmanship of Mongolian embroidery provide rich creative resources for modern design. Existing research mostly focuses on the analysis of embroidery patterns themselves, stitching techniques, and design innovation, but rarely explores the practical path of product design from the perspective of consumer demand. In view of this, this paper uses the KJ-Kano integrated model to analyze the application trends and demand preferences of Mongolian embroidery craft in design, thereby promoting the creative transformation and innovative development of traditional crafts, aiming to provide a theoretical basis and practical strategies for the modern application of traditional crafts, and to offer theoretical support and practical guidance for the modern transformation of Mongolian embroidery and traditional design, promoting its development in the contemporary market.

2. Research Status and Theoretical Basis

2 .1 Research Status of Mongolian Embroidery Products

Mongolian embroidery combines decoration and practicality, with coordinated patterns and color combinations, reflecting the Mongolian people's yearning for freedom, harmony, and happiness, representing a unique form that integrates art and function. (Bao. 2022) Currently, academia has conducted rich research on Mongolian embroidery from different perspectives. For example, Amur Batu classified the expression methods and stitching techniques of Mongolian embroidery; Musi et al., taking the case study of Horqin Mongolian woman Aoji, pointed out that the decorative form of Horqin Mongolian, primarily floral embroidery, is both a life practice formed through cultural exchange with other ethnic groups and a true portrayal of the locals' depiction of nature and perception of a better life; Wang Xinbing et al. coupled the embroidery of the Tushiyetu Prince's Mansion in Xing'an League with trendy brand clothing, making the artistic expression of Tushiyetu Prince's Mansion embroidery fit the modern aesthetic context. Guo Jiye et al., based on the perspective of cultural industry development and relying on skill inheritance and design concepts, proposed feasible plans for the application of Mongolian embroidery in cultural tourism product design. The above research provides a solid theoretical foundation for Mongolian embroidery product design. However, focusing on the product field, existing research has not yet delved into the structured analysis of consumer demand, especially regarding the adaptation of craft characteristics to modern life scenarios, where a significant gap exists. Building on previous research, this paper uses the KJ-Kano integrated model to analyze consumers' design demands for Mongolian embroidery products. By quantitatively analyzing consumers' functional needs and aesthetic preferences for embroidered products, a priority ranking system for design elements is established, providing a practical path for the innovative application of Mongolian embroidery in the field, thereby promoting the living inheritance and sustainable development of intangible cultural heritage crafts.

2.2 Principles and Application of the KJ-Kano Integrated Model

The KJ method, also known as the Affinity Diagram method, can classify and integrate chaotic opinions (information) based on internal relevance, making the internal logic of the stated information clearer; (Scupin. 1997) The Kano model classifies user needs into five categories (Fig.1), represented by M, O, A, I, and R respectively. By classifying user needs and sorting them according to importance and priority, it helps analyze which demand items should continue to be met and further enhanced, and which demands should be maintained at a stable level without further improvement, etc.; The Kano model helps identify and classify user needs, while the KJ method can perform weighted quantitative sorting of demands.

Currently, many scholars have introduced the KJ-Kano integrated model into the product design field to support product demand identification and design decision-making research. Ma Wenliang et al. used the KJ-Kano integrated model to study parent-child cultural and creative product design and development to enhance the satisfaction of parent-child users' emotional experience; Li Xizhen analyzed the design demand for wax-dyeing home products and proposed suggestions for optimizing consumer satisfaction; Li Zhaolong et al. analyzed the types of consumer demand for traditional Chinese blue dyeing products, providing theoretical guidance for the market positioning and innovation of blue dyeing products; Gao Yang et al. analyzed consumer demand in clothing customization mini-programs and optimized interface design to enhance user experience demand methods. In summary, the KJ-Kano integrated model has significant advantages in product design demand analysis, as it can scientifically quantify user needs and prioritize and optimally allocate product demands. In the process of analyzing the design demand for Mongolian embroidery products, by combining the KJ method and the Kano model to construct a systematic decision analysis framework (Fig.2), more accurate user demand matching information is provided for product design, thereby supporting more reasonable decision-making.

This paper is based on the KJ-Kano integrated model, using the KJ affinity diagram method to summarize and analyze qualitative interview data, combined with expert opinions to extract key information and generate questionnaire items, determining the research theme for the design demand of Mongolian embroidery products. Qualitative data related to the research theme were collected through interviews. After recording, summarizing, screening, and categorizing the collected information, they were classified according to similar content groups, processed through labeling and categorization, and following expert advice, the relationships between the content of each group were sorted out to form a list of design demands for Mongolian embroidery products. On this basis, following the structural framework of the Kano model, product demand items were determined through preliminary research, and the demand items were prioritized according to the classification results to determine user design demands for Mongolian embroidery products, analyzing the nonlinear relationship

between different element demands and consumer satisfaction. (Shi, et al. 2002) Kano model (Fig.3).

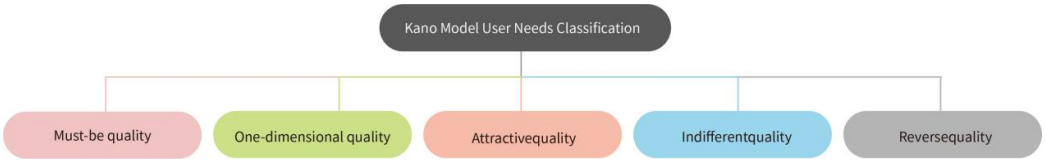

Figure 1. The Five Categories of User Requirements in the Kano Model

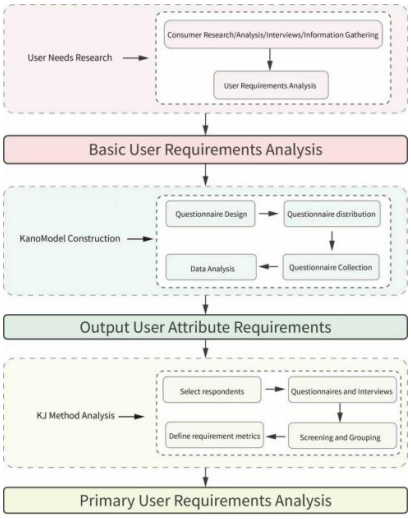

Figure 2. Research Path of KJ Kano Model Integration Design

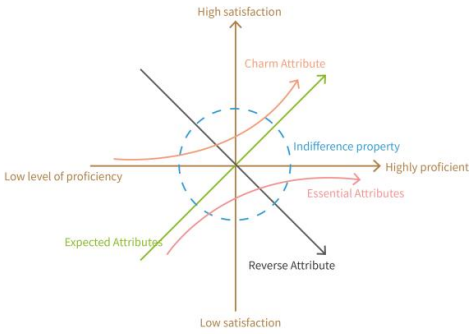

Figure 3. Kano model and attribute analysis of Mongolia embroidery products

3. Analysis of Design Demand for Mongolian Embroidery Products

This study analyzes the design demand for Mongolian embroidery products in two steps: 1) Organize interview data using the Affinity Diagram method, extract design demand elements, and construct a questionnaire; 2) Analyze questionnaire data through the Kano model, identify demand types and sort them to determine key demand elements.

3.1 Analysis of Consumer Demand Elements

To accurately grasp consumer demand, this study conducted in-depth interviews with 6 consumers who have experience purchasing Mongolian element products, 6 consumers who have purchased Mongolian embroidery products, and 6 professionals engaged in Mongolian product design. The interview data were analyzed and organized using the KJ method to extract consumer demand elements for Mongolian embroidery products. On this basis, an expert group consisting of 2 university teachers familiar with Mongolian embroidery, 3 designers,

and 2 inheritors of Mongolian embroidery craft was formed to categorize and screen the demand list. After discussion by the expert group, 22 design demand indicators were finally determined, covering six dimensions (Fig.4), providing a basis for questionnaire design and used to analyze consumer preference demands (Table 1).

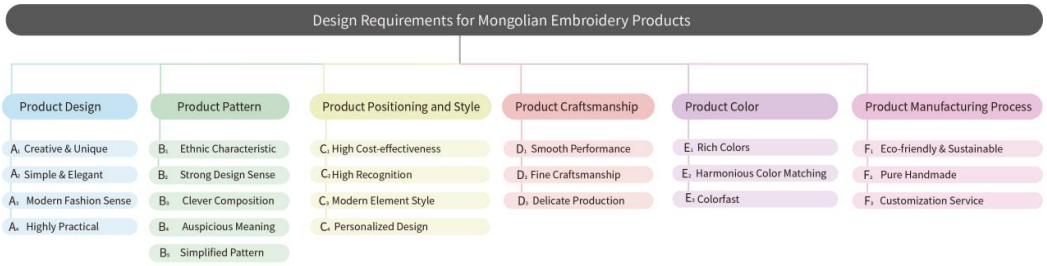

Figure 4. Classification List of Dimensions of Design Requirements for Mongolian Embroidery Products

Table 1 Dimension Analysis of Element

No.	Main Dimension	Sub-indicator	ndicator Selection Analysis
1	Product Form	A1 Creative & Unique	Consumers tend towards unique and novel products; design differentiation can meet their personalized needs.
		A2 Simple & Elegant	Consumers prefer simple designs, balancing complex and simple lines by simplifying pattern density.
		A3 Modern Fashion Sense	Integrating modern design elements makes products more attractive and aligns with fashion trends.
		A4 Highly Practical	Products with strong practicality and functionality can meet consumers' actual usage needs.
2	Product Pattern	B1 Ethnic Characteristic	Integrating traditional cultural elements showcases ethnic style and cultural heritage, enhancing ethnic identity and sense of belonging.
		B2 Strong Design Sense	Using unique design concepts showcases artistic value and aesthetic level, providing visual enjoyment and emotional resonance.
		B3 Clever Composition	Reasonably arranging element relationships makes the overall product structure harmonious, beautiful, and layered.
		B4 Auspicious Meaning	Integrating elements with positive connotations conveys positive emotions, meeting the pursuit of a better life and auspicious meanings.
		B5 Simplified Pattern	Pattern design is concise, expressing clear themes and artistic conception with few elements, showcasing minimalist beauty.
3	Product Positioning & Style	C1 High Cost-effectiveness	Providing relatively high performance attributes at a relatively low price meets the demand for "value for money."
		C2 High Recognition	Enhancing product awareness and influence through unique appearance design or identifiers, strengthening consumer memory and cognition.
		C3 Modern Element Style	Integrating modern elements showcases aesthetic styles that align with contemporary society.

		C4 Personalized Design	Integrating unique design elements meets user aesthetic preferences and needs, highlighting product uniqueness and distinctiveness.
4	Product Craftsmanship	D1 Smooth Performance	Smooth embroidery stitches can make patterns more vivid and natural, enhancing overall quality and aesthetics.
		D2 Fine Craftsmanship	Exquisite craftsmanship and detailed handling ensure precise and meticulous product craftsmanship, durable and beautiful.
		D3 Delicate Production	Delicate production can provide a high-quality experience in terms of touch, vision, etc.
5	Product Color	E1 Rich Colors	Showcasing rich visual effects and layers through color combinations increases product appeal and interest.
		E2 Harmonious Color Matching	Choosing mutually coordinated and reasonably matched color combinations enhances product aesthetics and sense of quality.
		E3 Colorfast	Maintaining stability during use, not easily fading with long-term use, preserving good appearance.
6	Product Production Process	F1 Eco-friendly & Sustainable	Using eco-friendly materials, following sustainable development concepts, meets consumers' pursuit of environmental awareness.
		F2 Pure Handmade	Using non-replicable and unique pure handmade production showcases artisan spirit and humanistic sentiment.
		F3 Customization Service	Emphasizing exclusive customization experience, providing one-to-one customization solutions, creating unique products fully meeting personal needs.

3.2 Questionnaire Design and Implementation

The questionnaire design is divided into two parts: the first part focuses on basic information statistics, covering demographic aspects such as gender, age, occupation, monthly income, etc.; the second part is based on the KJ-Kano integrated model, sorting out 22 user demand items. To accurately obtain feedback, each question has two scenarios: "demand exists" and "demand absent". Respondents choose from "very dislike" to "very like" on a five-level scale based on personal feelings to quantify their preference for each demand element (Table 2).

Table 2 Guidelines for Mongolian Embroidery Product Questionnaire

Indicator	Question	Very Dislike	Can Accept	Indifferent	Take for Granted	Very Like
Demand A1-F3	How do you evaluate it if this requirement is present?	1	2	3	4	5
	How do you evaluate it if this requirement is absent?	1	2	3	4	5

To ensure the reliability of the questionnaire survey, respondents were consumers with purchasing experience of Mongolian embroidery products and potentially interested groups. This study used a combination of online and offline methods, recovering a total of 296 valid questionnaires, including 242 online and 54 offline. The number of questionnaires is 10 times the number of indicators , (Deng. 2022) ensuring sample reliability.

According to the descriptive statistics of basic information, among the respondents, females accounted for

59.12%, males accounted for 40.88%; over 40% of visitors were in the "18-25 years" range, and the proportion of samples aged 26-35 was 31.08%. The proportion of "freelancers" was 30.74%; 35.81% of the respondents had "college" education, and undergraduate education accounted for 31.08%. The proportion of people with an income of "5000-7000 yuan" was 33.11%, and the proportion of people with an income of "7001-10000 yuan" was 32.77% (Table 3).

Table 3 Basic Information Descriptive Statistics

Name	Option	Frequency	Percentage (%)
Gender	Male	121	40.878
	Female	175	59.122
Age	Under 18	20	6.757
	18-25 years old	122	41.216
	26-35 years old	92	31.081
	36-45 years old	54	18.243
	Over 45 years old	8	2.703
Current Occupation	Student	48	16.216
	Enterprise Employee	25	8.446
	Civil Servant/Institution Staff	30	10.135
	Freelancer	91	30.743
	Retiree	39	13.176
	Other	63	21.284
Education Level	High School and Below	12	4.054
	College	106	35.811
	Undergraduate	92	31.081
	Master's Degree	75	25.338
	Doctoral Degree	11	3.716
Monthly Income	5000 yuan and below	82	27.703
	5000-7000 yuan	98	33.108
	7001-10000 yuan	97	32.77
	10000 yuan and above	19	6.419

3.3 Sample Reliability and Validity Analysis

This study used SPSS 28.0 software to test the reliability and validity of the valid data to ensure the accuracy of the research results and provide a reliable basis for subsequent analysis. The reliability test results showed that the overall Cronbach's α coefficient was 0.924, and the Cronbach's α coefficients for the positive and reverse questions were 0.876 and 0.903 respectively (both greater than 0.7), indicating high questionnaire reliability. The validity test results showed that the overall KMO value was 0.852, and the KMO values for the positive and reverse questions were 0.816 and 0.887 respectively (both greater than 0.8), and the closer the KMO value is to 1, the more suitable the data is for factor analysis. The P-values of the Bartlett sphericity test were all less than 0.05, indicating significant correlation between variables (Table 4). The results indicate that the questionnaire has high reliability and validity, and the data is highly reliable.

Table 4 Reliability and Validity Analysis

Test of KMO and Bartlett		Overall	Positive	Reverse
KMO Value		0.852	0.816	0.887
Bartlett Sphericity Test	Approx. Chi-Square	6930.59	2861.07	2716.939
	df	946	231	231
	p-value	0	0	0

4. Demand Item Classification and Importance Analysis

4.1 Demand Classification Evaluation Results

After classifying and screening the 22 demand items based on the Kano model, in the various demand dimensions of Mongolian embroidery product design, there are 6 items each for attractive, one-dimensional, and must-be attributes, 4 items for indifferent attributes, and no reverse or questionable attributes appeared. The Better-Worse coefficient is a key indicator for measuring the impact on consumer satisfaction. Its calculation method follows the formula proposed by Berger (Berger, et al. 1993) and is presented in percentage form (Table 5). The Better coefficient ranges from 0 to 1, reflecting the positive effect of product satisfaction of a specific demand on consumer satisfaction; the Worse coefficient ranges from -1 to 0, reflecting the negative impact when the demand is not met. The larger the absolute values of both, the more significant the impact of the demand on satisfaction. Based on this analysis result, optimization strategies can be formulated to further enhance consumer experience and satisfaction.

The calculation method for the Better-Worse coefficient is as follows:

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

$$Worse = (O + M) / (A + O + M + I) \quad (2)$$

Table 5 Traditional KANO Model Analysis

Function/Service	A	O	M	I	R	Q	Category Result	Better	Worse
A1(Pos) /A1(Neg)	10.81 %	0.00%	43.58 %	27.37 %	14.19 %	4.05%	Must-be	13.22 %	-53.31%
A2(Pos) /A2(Neg)	10.47 %	0.68%	52.03 %	19.60 %	7.43%	9.80%	Must-be	13.47 %	-63.67%
A3(Pos) /A3(Neg)	54.73 %	0.00%	5.07%	34.12 %	5.41%	0.68%	Attractive	58.27 %	-5.40%
A4(Pos) /A4(Neg)	30.41 %	1.35%	6.08%	43.24 %	9.46%	9.46%	Indifferent	39.17 %	-9.17%
B1(Pos) /B1(Neg)	15.54 %	32.77 %	0.00%	25.34 %	17.23 %	9.12%	One-dimensional	65.60 %	-44.50%
B2(Pos) /B2(Neg)	13.18 %	36.15 %	1.01%	34.46 %	4.73%	10.47 %	One-dimensional	58.17 %	-43.83%
B3(Pos) /B3(Neg)	11.82 %	0.34%	16.22 %	48.65 %	16.55 %	6.42%	Indifferent	15.79 %	-21.49%
B4(Pos) /B4(Neg)	43.92 %	0.00%	20.27 %	19.60 %	13.51 %	2.70%	Attractive	52.42 %	-24.19%
B5(Pos) /B5(Neg)	8.45%	0.00%	46.96 %	24.32 %	15.88 %	4.39%	Must-be	10.59 %	-58.90%
C1(Pos) /C1(Neg)	5.41%	6.08%	23.99 %	44.93 %	13.18 %	6.42%	Indifferent	14.29 %	-37.40%
C2(Pos) /C2(Neg)	59.80 %	0.00%	10.47 %	20.61 %	8.11%	1.01%	Attractive	65.80 %	-11.52%
C3(Pos) /C3(Neg)	55.74 %	0.00%	2.03%	34.46 %	6.76%	1.01%	Attractive	60.44 %	-2.20%
C4(Pos) /C4(Neg)	54.73 %	0.00%	4.05%	30.07 %	9.12%	2.03%	Attractive	61.60 %	-4.56%
D1(Pos)	2.37%	29.05	14.19	28.04	17.57	8.78%	One-	42.66	-

/D1(Neg)		%	%	%	%		dimensional	%	58.72%
D2(Pos) /D2(Neg)	15.54 %	27.03 %	3.72%	26.01 %	21.28 %	6.42%	One-dimensional	58.88 %	-42.52%
D3(Pos) /D3(Neg)	0.00%	37.50 %	3.04%	32.77 %	19.60 %	7.10%	One-dimensional	51.15 %	-55.30%
E1(Pos) /E1(Neg)	9.80%	0.34%	45.61 %	27.37 %	12.16 %	4.73%	Must-be	12.20 %	-55.29%
E2(Pos) /E2(Neg)	6.76%	0.00%	47.30 %	32.43 %	7.77%	5.74%	Must-be	7.81%	-54.69%
E3(Pos) /E3(Neg)	60.81 %	0.68%	1.35%	32.77 %	2.70%	1.69%	Attractive	64.31 %	-2.12%
F1(Pos) /F1(Neg)	9.80%	0.00%	51.01 %	22.64 %	11.82 %	4.73%	Must-be	11.74 %	-61.13%
F2(Pos) /F2(Neg)	0.00%	37.16 %	2.37%	28.72 %	20.61 %	11.15 %	One-dimensional	54.46 %	-57.92%
F3(Pos) /F3(Neg)	8.78%	0.00%	2.70%	70.95 %	8.45%	9.12%	Indifferent	10.66 %	-3.28%

4.2 Demand Indicator Optimization and Priority Sorting

In past research, traditional Kano model classification often had a high proportion of indifferent attributes, (Liu, et al. 2022) which might affect the accuracy of evaluation results. To solve this problem, this study uses a four-quadrant chart to classify the demand for Mongolian embroidery products, clearly dividing the quadrant attribution and priority of demand items (Fig.5). Given the shortcomings of the Better-Worse classification method in identifying questionable and reverse factors, this study combines the traditional classification method and the Better-Worse classification method, first using the traditional method to eliminate questionable factors, and then performing a secondary Better-Worse classification on the remaining elements, thereby improving the accuracy and effectiveness of classification.

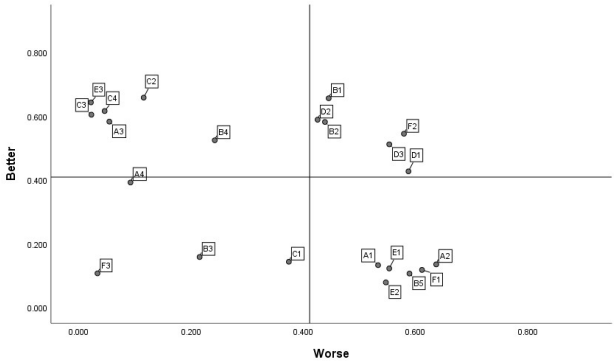

Fig.5 Better-Worse coefficient quadrant

In the Better-Worse coefficient scatter plot, the design of Mongolian embroidery products is influenced by various demand attributes, and demand elements are distributed across four quadrants. Elements in the first quadrant have both Better and Worse values higher than 0.5 and are classified as one-dimensional factors. Satisfying such demands can significantly enhance consumer satisfaction, while not meeting them will greatly reduce satisfaction. Elements in the second quadrant have a Better value higher than 0.5 and a Worse value lower than 0.5, classified as attractive factors. Satisfying such demands can bring additional satisfaction and surprise, having a potential positive enhancement effect. Elements in the third quadrant have both Better and Worse values lower than 0.5, classified as indifferent factors. Such demands have little impact on overall satisfaction, and whether they are met or not will not significantly change consumer perception. Elements in the fourth quadrant have a Better value lower than 0.5 and a Worse value higher than 0.5, classified as must-be factors. These are basic requirements consumers have for the product. Although meeting them will not add extra satisfaction, failing to meet them will directly lead to a decrease in satisfaction.

According to Fig.5, the following 6 demands belong to must-be demands, namely A1 (Innovative), A2 (Simple & Elegant), B5 (Simplified Pattern), E1 (Rich Colors), E2 (Harmonious Color Matching), F1 (Eco-friendly). These demand items are the most critical in Mongolian embroidery product design. If the above demands are

missing, consumer satisfaction will drop significantly. B1 (Ethnic Style), B2 (Strong Design Sense), D1 (Smooth Stitches), D2 (Fine Craftsmanship), D3 (Delicate Production), F2 (Handmade) belong to one-dimensional demands. Satisfying such demands can significantly improve consumer satisfaction, while failing to meet them may lead to decreased satisfaction. A3 (Modern Sense), B4 (Auspicious Symbolism), C2 (High Recognition), C3 (Modern Style), C4 (Personalized), E3 (Colorfast), etc., belong to attractive demands. If these demands are met, although they do not affect basic consumer satisfaction, they can further enhance satisfaction and should be considered and valued in design. A4 (Practicality), B3 (Clever Composition), C1 (High Cost-effectiveness), F3 (Customization Service) are indifferent demands. Whether these demands are met has little impact on consumer satisfaction, so their priority can be appropriately reduced. Based on the above analysis, the sensitivity of each demand item is calculated using the Better-Worse coefficient, and then priority sorting is carried out based on the sensitivity value. Among them, the closer the sensitivity coefficient S is to 1, the more sensitive consumers are to that demand item, and it needs to be prioritized. The optimized Kano model demand classification and sorting results (Table 6), the sensitivity calculation formula is:

$$S = \sqrt{Better^2 + Worse^2} \qquad (3)$$

Table 6 Optimised Kano Model Demand Classification and Ranking Results

Category	ID	Classification Result	Sensitivity (S)	Priority Order
Product Form	A1	Must-be	0.549	18
	A2	Must-be	0.651	8
	A3	Attractive	0.585	14
	A4	Indifferent	0.402	19
Product Pattern	B1	One-dimensional	0.793	2
	B2	One-dimensional	0.728	4
	B3	Indifferent	0.267	21
	B4	Attractive	0.577	15
	B5	Must-be	0.598	13
Product Positioning & Style	C1	Indifferent	0.400	20
	C2	Attractive	0.668	7
	C3	Attractive	0.605	12
	C4	Attractive	0.618	11
Product Craftsmanship	D1	One-dimensional	0.726	6
	D2	One-dimensional	0.726	5
	D3	One-dimensional	0.753	3
Product Color	E1	Must-be	0.566	16
	E2	Must-be	0.552	17
	E3	Attractive	0.643	9
Product Production Process	F1	Must-be	0.623	10
	F2	One-dimensional	0.795	1
	F3	Indifferent	0.111	22

To intuitively present the importance and ranking of design demand elements for Mongolian embroidery products, the sensitivity ranking of demand elements is based on the four major demand attributes and six design dimensions (Table 7). The results show that in the product form dimension, the priority order is A2 > A3 > A1 > A4. Among them, A2 (Simple & Elegant) has a high sensitivity coefficient and belongs to the must-be attribute, indicating that a simple and elegant appearance is crucial for consumer satisfaction, and failing to meet this demand will significantly reduce satisfaction. A4 (Practicality) has low sensitivity and is an indifferent attribute, indicating that consumers pay relatively less attention to the practicality of embroidered products.

In the pattern design dimension, the priority order is B1 > B2 > B5 > B4 > B3. Among them, B1 (Ethnic Characteristic) and B2 (Strong Design Sense) have high sensitivity coefficients and belong to one-dimensional attributes, indicating that consumers are more concerned about the cultural heritage and innovation in pattern design. Satisfying these demands can enhance satisfaction, while conversely, it may reduce satisfaction. Therefore, the above elements play a key role in enhancing consumer satisfaction. B3 (Clever Composition) has low sensitivity and is an indifferent attribute, indicating that consumers pay relatively less attention to it.

In the product positioning and style dimension, the priority order is C2 > C4 > C3 > C1. Among them, C2 (High Recognition) has the highest sensitivity coefficient, indicating consumers' attention to the personalized

positioning of the product. Satisfying this demand helps improve satisfaction. In the product craftsmanship dimension, the priority order is D3 > D1 > D2. The demand items in this dimension have high sensitivity coefficients and are all one-dimensional attributes, indicating that consumers pay attention to craftsmanship quality. Satisfying these demands can significantly improve satisfaction, while not meeting them may lead to decreased satisfaction.

In the product color dimension, the priority order is E3 > E1 > E2. Among them, E3 (Colorfast) has a high sensitivity coefficient and belongs to the attractive attribute. Satisfying this demand can significantly improve satisfaction. E1 (Rich Colors) and E2 (Harmonious Matching) have low sensitivity coefficients but are must-be attributes. If not met, they may significantly reduce consumer satisfaction. Therefore, the demand for colorfastness should be focused on in design, while ensuring rich colors and harmonious matching.

In the product production dimension, the priority order is F2 > F1 > F3. Among them, F2 (Pure Handmade) has a high sensitivity coefficient and one-dimensional attribute characteristics, indicating that consumers pay high attention to the handmade nature of the product, which has a significant role in enhancing consumer satisfaction. F1 (Eco-friendly & Sustainable) has a high sensitivity coefficient and must-be attribute characteristics, indicating that consumers pay high attention to the environmental performance of the product, which significantly promotes consumer satisfaction.

Through the above analysis, the importance and ranking of each demand element in Mongolian embroidery design products can be clarified. In the product design process, must-be attribute demand elements should be prioritized to ensure the basic functions and performance of the product; secondly, one-dimensional attribute demand elements should be focused on to enhance product competitiveness; at the same time, attractive attribute demand elements should also be considered to add differentiated advantages to the product. This sorting method can provide a relatively scientific decision-making basis when resources are limited, helping to optimize the design direction and save development costs.

Table 7 order of sensitivity of demand factors of Mongolia embroidery products

Attribute Importance Ranking	Sorting Method	Importance Ranking
(a) Attribute Importance Sorting	Must-be Attributes	A2>F1>E1>E2>B5>A1
	One-dimensional Attributes	F2>D3>B1>D1>D2>B3
	Attractive Attributes	C2>E3>C4>C3>B4>A3
	Indifferent Attributes	A4>C1>B3>F3
(b) Category Importance Sorting	Product Form	A2>A3>A1>A4,
	Product Pattern	B1 > B2 > B5 > B4 > B3
	Product Positioning & Style	C2> C4 > C3 > C1
	Product Craftsmanship	D3 > D1 > D2
	Product Color	E3 > E1 > E2
	Product Production Process	F2 > F1 > F3

4.3 Consumer Demand Analysis

Currently, young consumer groups not only focus on the inheritance and promotion of traditional culture but also emphasize the integration of traditional elements with modern aesthetics, creating products that combine cultural connotation and modern life needs. Mongolian embroidery, with its profound cultural heritage, is gradually gaining favor among the new generation of consumer groups. This study takes Mongolian embroidery products as the research object and analyzes consumer demand preferences, which is of great significance for enriching the practice and innovation of ethnic product design.

From the perspective of consumer demand analysis, the basic attributes of the product are the focus of consumers' attention. For example, must-be attributes such as rich and harmonious colors and environmental sustainability are basic requirements of consumers for Mongolian embroidery products. The absence of these attributes will significantly reduce consumer satisfaction and must be valued in product design. One-dimensional attributes have a significant effect on improving consumer satisfaction. Demands such as fine craftsmanship, pure handmade production, and strong design sense reflect consumers' high attention to product quality and design innovation. Meeting these demands can make Mongolian embroidery products more competitive in the market and attract consumers who pursue high quality and unique design. When attractive attributes such as modern fashion sense, personalized design, and high recognition are met, they bring additional surprise and satisfaction to consumers. Meeting such demands can more effectively attract consumers who pursue

personalization and a sense of fashion.

According to the analysis of different consumer demands, on the one hand, consumers' sense of identity with traditional culture is enhanced, and they hope to express respect and inheritance for traditional culture by purchasing and using products with ethnic characteristics. Therefore, traditional elements of Mongolian embroidery should be fully integrated into product design to highlight unique cultural charm and cultural value. On the other hand, consumers also put forward higher requirements for the modern sense and practicality of products. On the basis of meeting cultural inheritance, products need to adapt to modern life scenarios and have both practicality and a sense of fashion. Mongolian embroidery can be applied to modern clothing, accessories, household items, etc., so that it has both cultural connotation and can be integrated into daily life.

Consumers' personalized demands are also increasingly prominent. The new generation of consumers is no longer satisfied with uniform products and pursues more personalization and uniqueness. Product design should focus on personalized expression; and as consumers' environmental awareness increases, they also pay more attention to the environmental attributes of products. In the production process of Mongolian embroidery products, eco-friendly materials should be prioritized, sustainable production processes should be adopted, and consumers' response and demand for environmental protection concepts should be followed. Currently, consumers' demands for Mongolian embroidery products show characteristics of diversification and personalization. Their product design should also focus on the combination of traditional culture and modern aesthetics, actively responding to consumers' identification with cultural confidence, personalized expression, and environmental values. Through continuous innovation and optimization, Mongolian embroidery products can gain greater market development space, realizing the creative transformation and innovative development of excellent traditional Chinese culture.

5. Research Results and Discussion

5.1 Research Conclusions

This study used a variety of methods such as interviews, questionnaire surveys, and the KJ-Kano integrated model to explore how to effectively enhance consumer satisfaction and market competitive advantage by optimizing product design, providing a theoretical basis and practical strategies for product optimization and market expansion. The research results indicate that consumer demand for Mongolian embroidery products presents multiple levels and dynamics, which can be specifically classified into must-be attributes, one-dimensional attributes, attractive attributes, and indifferent attributes according to the classification logic of the Kano model. Consumer demand for Mongolian embroidery product design shows obvious hierarchy and diversification, including both expectations for basic functions and attention and pursuit of cultural value, personalized style, and environmental protection concepts. Therefore, in the design and application of Mongolian embroidery products, the combination of traditional culture and modern aesthetics should be emphasized to meet consumers' pursuit of cultural identity and personalized expression. Through continuous innovation and optimization, Mongolian embroidery products can gain greater development space in the market, realizing the creative transformation and innovative development process of traditional culture empowering "ethnic design". Accordingly, the following conclusions are drawn:

Current consumers value both the ethnic cultural symbols derived from embroidery and their adaptability in modern life scenarios, making must-be attributes the basic requirements of consumers for Mongolian embroidery products. Attributes such as rich colors, harmonious matching, and environmental sustainability constitute the basic quality of product design. If missing, it will significantly reduce consumer satisfaction. Therefore, in the design process, the combination of traditional elements and modern aesthetics should be emphasized, balancing the fit between traditional cultural elements and current popular trends, thereby realizing the organic unity of its cultural value and practical function, and meeting consumers' dual needs for the basic function and cultural value of Mongolian embroidery products.

One-dimensional attributes have a significant effect on improving consumer satisfaction. Demands such as fine craftsmanship, pure handmade production, and strong design sense reflect consumers' high attention to product quality and innovation. Consumers pay high attention to the craftsmanship quality of Mongolian embroidery products and expect to feel the value of the product through exquisite craftsmanship and unique design. Meeting these demands can significantly enhance the market competitiveness of the product and increase consumers' attention to Mongolian embroidery products. In design, the optimization of craftsmanship and innovation in design should be emphasized to improve the overall quality of the product.

Attractive attributes provide differentiated competitive advantages for product design. Demands such as modern fashion sense, personalized design, and high recognition are not basic requirements of consumers, but if met, they can significantly improve consumer satisfaction and surprise. As consumers' pursuit of personalization and a sense of fashion increases, especially when national confidence and cultural identity are increasingly enhanced, the new generation of consumer groups hopes to express cultural identity, cultural confidence, and personal interpretation by purchasing products with ethnic characteristics. Therefore, the integration of personalization and a sense of fashion needs to be emphasized in product design, and innovative design should be used to meet consumers' pursuit of uniqueness and personalization.

In addition, although indifferent attributes have little impact on consumer satisfaction, they should also be used as a reference for product optimization when resources permit. For example, although product practicality and cost-effectiveness are not the focus of consumers' attention, their impact on the overall value of the product still needs to be considered in design. And as the concept of environmental protection becomes deeply rooted in people's hearts, consumers are paying more attention to the environmental value of products. The Mongolian embroidery industry should implement environmental protection concepts in production and design practices, align with consumers' environmental concerns, injecting new vitality into industrial development.

5.2 Suggested Strategies and Discussion

1)From appealing to products to "shaping" culture, enhance the inheritance value of ethnic embroidery products. In the design process of Mongolian embroidery products, must-be attributes should be strengthened to ensure basic quality, such as maintaining the traditional characteristics of high saturation color matching and full patterns, paying attention to the harmony of color matching, and focusing on simplicity and elegance. On this basis, one-dimensional attributes can be highlighted to enhance product competitiveness, such as combining modern technology to optimize traditional embroidery processes and improve production efficiency. Integrate modern design concepts, combine traditional patterns with modern elements, and integrate current popular trends to enhance the fashion sense of traditional embroidery. In addition, the pure handmade attribute can be appropriately strengthened, and the uniqueness and added value of the product can be enhanced through methods such as "limited edition" and "customization". Narrate the cultural background and the stories behind the production process to strengthen cultural connotation. Reasonably pay attention to indifferent attributes to balance cost and benefit, focus on product practicality, optimize production processes and cost control, and improve cost-effectiveness.

2)Value orientation and communication from ethnic symbols to cultural resonance. For the design of Mongolian embroidery products, not only should product quality be improved, but brand development and innovation should also be emphasized. For example, channels and methods such as social media and fashion blogger promotion can be used to display the process of craft inheritance and innovation, and enhance the artistic value of the product. By holding embroidery training classes and intangible cultural heritage inheritance activities, more intangible cultural heritage enthusiasts can participate, and for the needs of cultural enthusiasts, activities such as cultural exhibitions and intangible cultural heritage activities (holding embroidery culture festivals, intangible cultural heritage exhibitions, etc.) can be used to strengthen the artistic value of the craft itself, to enhance consumers' cultural identity and cultural confidence in Mongolian embroidery products. Cultural and educational activities can also be carried out in schools, communities, and other places to display the charm of Mongolian embroidery and increase public awareness and protection awareness of traditional culture.

3) Focus on environmental protection and sustainable production development, and empower products with new value through "redesign". Since the 21st century, with the popularization of sustainable development concepts and the improvement of environmental awareness, sustainable development concepts and the recycling of product materials and resources have become trends in product development. In the design and production process of Mongolian embroidery products, eco-friendly materials can be used accordingly, such as replacing animal fur with synthetic leather, and energy consumption and waste emissions can be reduced by optimizing production processes to enhance the environmental value of embroidered products; old product recycling and reuse activities can also be appropriately carried out to strengthen the concept of sustainable development and balance the direct benefits between society and economy. The development of the Mongolian embroidery industry can also drive local employment and promote regional economic development; use online channels such as e-commerce platforms and social media to expand sales scope and influence, and display products through methods such as live streaming and short video promotion; open brand specialty stores or showrooms to provide consumers with opportunities to experience product production firsthand. On this basis, launch co-branded

products through cross-border cooperation, leverage brand influence and fan base to expand market coverage, and enhance the added value and market competitiveness of Mongolian embroidery products through brand operation, promoting the creative transformation and innovative development of Mongolian embroidery culture.

6. Conclusion

This study conducted a systematic analysis of the design demand for Mongolian embroidery products, clarified the hierarchy of consumer demand through various research methods, and proposed targeted design optimization and market promotion strategies. During the implementation of this study, every effort was made to ensure rigorous research, but there are certain limitations. Although the sample covered consumers of different ages, genders, and occupations, the sample collection was relatively concentrated, lacking extensive research; secondly, the prediction of future trends and tracking of dynamic demands were slightly insufficient, and research on environmentally friendly production and systematic brand promotion was lacking. In future research, the scope of research can be expanded to cover more regions and consumer groups, track changes in consumer demand in real-time, deepen the application of eco-friendly materials and optimization strategies for green production processes, systematically integrate brand resources, improve multi-channel promotion strategies, to enhance brand influence and market competitiveness, and promote the sustainable development of the Mongolian embroidery industry.

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