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Research on Consumer Psychological Factors of Kano Model Based on Innovative Design of Veneer Technology

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Abstract: Objective To determine the priority of consumers' emotional demand for veneer product design by using Kano model, and to design a veneer technology product with practicability and daily use value. Methods Consumer demand was investigated, consumer demand factor hierarchy model was constructed based on emotional design theory to analyze consumer demand, and the final design factor was determined by sensitivity ranking of Kano model. Results The Kano model made the product demand analysis process more objective and perfect, realized the exploration and practice of the design innovation of veneer products, and provided positive reference value for the subsequent inheritance of veneer technology. Conclusion Through the expansion of Kano model, it is proved that consumer psychological factors play an important role in the design of veneer products, which solves the problem that the design of veneer products lacks innovation, cannot be integrated into the modern life scene, and is difficult to meet the needs of modern life.

Keywords: Product design of veneer technology; Kano model; Consumer psychology

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Veneer technology has an important historical position in the history of the development of traditional metal technology in China, and there are still inheritors to continue this traditional technology. Mongolian inlaying process is a special process in the traditional metal process of the Mongolian nationality. It mainly uses hammer 揲, chisel, inlaying and other skills on the basis of gold, silver and other craft products, and integrates the composite process of Mongolian, Tibetan, Han and other multi-ethnic crafts, commonly known as "Mongolian inlaying" or "Mongolian inlaying process". In 2021, "Mongolian Mosaic technology" was approved as the intangible Cultural heritage list of Inner Mongolia Autonomous Region. In the same year, it was approved as a national intangible cultural heritage list.

At present, the design of veneer craft products lacks the analysis of user consumption psychology and relies more on the perceptual leadership of designers, so the designed products are highly subjective. This study will focus on the research of veneer craft products, and calculate the priority of consumer demand from a quantitative perspective by using the ranking method of user demand sensitivity based on Kano model. Thus making the veneer technology more competitive in the market.

1. Research Overview

1.1 Research Ideas

The idea of this research is to take the design of veneer technology products as an example, to carry out the decision analysis of the priority of consumer demand factors in a quantitative and qualitative way, so as to guide the design practice.

1.2 Kano model theory and research

Kano model is a method to study the influencing factors of user demand and satisfaction. According to the subjective awareness of consumers, the Kano model divides consumer demand into five categories. In order to understand consumers' demand for veneer products, Kano questionnaire was used to investigate consumers. For each demand element, positive and negative questions are asked, and each question contains 5 different satisfaction level options to test the different responses of consumers. In order to categorize the analysis results of consumer demand information in the early stage of design, Kano evaluation model is used to classify each demand item according to the obtained data.

2. User demand analysis of veneer technology products

2.1 User Research

At the initial stage of design exploration, in view of the existing problems of veneer products in the market, in-depth user research was conducted to collect consumers' demands for the function and decoration of veneer products, and a research team consisting of 5 product designers, 5 veneer practitioners and 5 loyal consumers of veneer products was formed to screen and combine similar demand words. There are 15 primary evaluation indexes including material, color, pattern, etc., and 20 secondary evaluation indexes. Based on Norman's emotional design theory, 20 secondary evaluation indexes are classified from instinct level, behavior level and reflection level. According to the requirements of the three levels of emotion, the elements of the requirements of veneer technology products are matched with the three levels of emotional design.

2.2 Determine the type of demand indicators based on Kano model

According to 20 demand factors, a random survey was carried out on buyers of veneer products, 7 invalid questionnaires were eliminated, and 147 valid questionnaires were obtained. According to the Kano evaluation model, the questionnaire options were counted and the attributes of all the demand factors were obtained. Then, the satisfaction coefficient (SI) and dissatisfaction coefficient (DSI) were calculated according to formulas (1) and (2). The closer the absolute value of SI is to 1, the stronger the effect of improving user satisfaction will be. The closer the DSI value of the dissatisfaction coefficient is to -1, the stronger the effect of reducing user satisfaction is. In order to obtain the user's demand priority for the coating process products more intuitively and clearly, the scatter plot is established according to the Better-Worse coefficient values, as shown in Figure 1.

$$SI = \frac{F(A)+F(O)}{F(A)+F(O)+F(M)+F(I)} \quad (1)$$

$$DSI = \frac{F(O)+F(M)}{F(A)+F(O)+F(M)+F(I)} \quad (2)$$

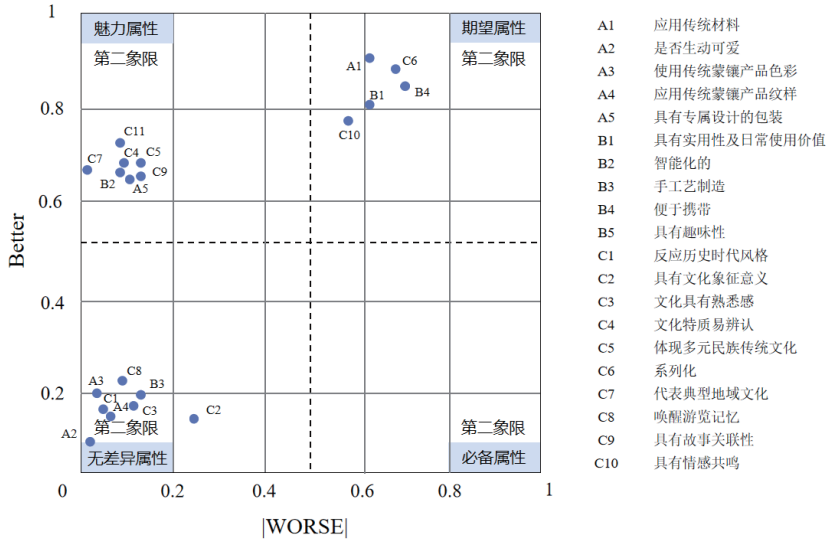

Fig1. Better worse scatter chart

As can be seen from the chart, there is a close relationship between expectant demand and consumer satisfaction, and it is also an important factor to promote product innovation. In the actual design scheme, the design expression that reflects this kind of demand as much as possible is helpful to enhance the satisfaction of consumers. Therefore, in the design and development of Mongolian and inlaid process products, we should focus on the five aspects of reflecting the traditional culture of multi-ethnic groups (C5), having

practicability and daily use value (B1), applying traditional materials (A1), serialization (C6), and ease of carrying (B4).

2.3 Conclusion Analysis

In the traditional Kano model, the priority order of demand factors is M>O>A>I. According to the demand factor sensitivity (S) index, the higher the value of S, the higher the importance of the demand, which should be given priority in design practice [1]. According to formula (3), the sensitivity of each demand factor is calculated to obtain the priority of the demand factor. The sorting results are shown in Table 2.

According to the ranking results, in the instinctive level, the priority of demand is A1 > A5 > A4 > A3 > A2, where the sensitivity coefficient of quoting traditional materials (A1) is the highest and belongs to the expected attribute, indicating that users attach great importance to whether to extend the use of veneer original materials, such as gold, silver, red coral, lapis lazuli, etc., in product design.

In the level of behavior, the priority of demand is B1 > B4 > B5 > B2 > B3, and the sensitivity coefficient of practicality and daily use value (B1) is high, and it is in the second place of the expected attribute, indicating that users attach great importance to whether the veneer technology products can be integrated into daily life. Whether it is easy to carry (B4) sensitivity coefficient ranks second and belongs to the expected attribute, indicating that users pay great attention to its size, weight and other basic issues in the use process.

In the reflection level, the priority of demand is C5 > C6 > C10 > C7 > C4 > C9 > C2 > C8 > C3 > C1, which means that the sensitivity coefficient of reflecting the multi-ethnic traditional aesthetic taste (C5) is the first and the expected attribute is the first, indicating that the multi-ethnic culture contained in the veneer process will greatly affect user satisfaction and should be paid attention to. The inheritance of traditional technology (C6) ranks second with a high sensitivity coefficient and is an expected attribute, indicating that it will also affect user satisfaction.

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

According to the previous analysis, the top features in Table 2 are selected as the main priority design elements, including the embodiment of multi-ethnic traditional culture (C5), practicability and daily use value (B1), application of traditional materials (A1), serialization (C6) and portability (B4). Prioritizing the elements to guide the design can maximize the satisfaction of user consumption psychology, increase product value, and create higher profit margins.

Peroration

It is found that the consumer demand of veneer technology products is mainly concentrated in the expectation demand, that is, the product features with practicability and daily use value. This reflects the user's subjective feelings when using the previous veneer process products, which can not be integrated into daily life. Therefore, the product design method based on consumer psychology can be applied to the development of other intangible heritage technologies. Because this method is based on the design of user needs as the starting point, it is essentially a user-centered design research.

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