

Research on the Requirements of Museum IP Image Design Based on Kano Model — Taking the IP Image Tang Nui of Shaanxi Museum as an Example

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ABSTRACT

Purpose: In recent years, with the successive launch of the museum IP image, the IP image has the problems of homogenization, lack of novelty in design, and strong subjectivity of the designers, etc. To solve these problems, the author analyzes the IP image "Tang Nui" of the Shaanxi History Museum. To solve these problems, the author analyzes the IP image "Tang Nui" of the Shaanxi History Museum and provides strong support for the design of museum IP images through scientific data analysis. **Methods:** A combination of online questionnaire research and offline expert interviews was used. **Conclusion:** The paper uses the IP image "Tang Niu" from Shaanxi History Museum as a case study, and establishes a priority model of the relationship between the museum's IP image and user needs through data analysis. This aims to enhance user satisfaction with the design and provide a digital foundation for future museum IP image design.

Keywords: Kano model, IP image, Design requirements, Museums.

1. INTRODUCTION

With the development of China's economy and the continuous improvement of people's living standards, cultural consumption is a new form of consumption. It has gradually become an important part of social life. The government has also gradually realized the potential of the cultural industry and started to increase its support and investment in the cultural sector. In this context, museums, as an important part of the cultural industry, have become one of the hotspots in the cultural creative industry with their IP image design. Meanwhile, with the rise of tourism, cultural tourism has become one of the focuses of tourism development in various places. As a convergence point of the cross development of the cultural industry and tourism industry, the IP image design of museums is not only a cultural symbol but also an important means to attract tourists and enhance the cultural soft power of the region. Therefore, governments around the world have introduced policies to support the development of cultural tourism, providing market demand and policy support for museum IP image design.

The Ministry of Culture and Tourism released opinions on the development of the digital culture industry to the public on November 26, 2020, proposing to strengthen the development and transformation of cultural IP. The Opinions on Promoting the High-Quality Development of the Digital Culture Industry pointed out that the development of the digital culture industry should promote the deep integration of the culture industry with the digital economy and real economy, expand the supply of high-quality digital culture products, build the ecosystem of the digital culture industry, promote consumption upgrading, and actively integrate into the new development pattern of "double cycle". To effectively promote the development of the digital culture industry, the opinion requires grasping the data-driven, science and technology support, implementing the deployment of the national cultural big data system construction, promoting the integration of cultural data resources; promoting the digitization of excellent cultural resources, digitize and develop cultural resources, and let the excellent cultural resources "come alive" with the help of digital technology. The following is a list of some of the

most important cultural resources that have been developed in the past few years.¹

1.1 Research Status

In recent years, the development of museum IP images has been rapid, and all local museums have successively launched IP visual images with their venue characteristics or regional cultural characteristics. Successful IP image design can create a unique brand image for museums, enhance their status and influence in the cultural industry, attract more audiences and tourists, and at the same time, it also has many functions such as culture, fun, interactivity, etc., which brings cross-border cooperation opportunities for museums. Just as the IP image "Tang Nui" of Shaanxi History Museum has exploded in popularity, through cooperation with other industries, such as cultural creativity, tourism, and other fields, it provides a broader market and development space for the development of museums.

However, some museums pay too much attention to commercialization considerations when designing IP images, while neglecting the respect for cultural connotation and historical inheritance, resulting in the lack of uniqueness and depth of the IP image. At this stage, most of the IP images are more homogeneous, with insufficient design concepts, more subjective influence by designers, and a lack of corresponding theoretical data support.

1.2 IP Image Definition

The "IP" mentioned in this article can neither be equated with the traditional concept of "intellectual property" nor simply summarized as a specific "adaptation right", but is a cultural resource with an adhesive fan base that can develop a long-term derivative industry chain. ", but a kind of cultural resources with a sticky fan base, can develop a long-term vitality of the derivative industry chain. [1] Museum IP image is a medium and carrier of emerging entertainment promotion rooted in the history and culture of museums, drawing on regional characteristics and popular in the times.

1.3 Kano Model Definition

The Kano model was invented by Noriaki Kano, a professor at Tokyo Institute of Technology, as a two-dimensional cognitive model used to

1. Ministry of Culture and Tourism promotes digital development and transformation of cultural IPs

categorize and rank real user needs in a product or service, and then to analyze the degree of user satisfaction and the degree of need for a quality element of a product or item. [2] The quality attributes are categorized into five types of needs based on the difference in the values of the data, which are Excitement Quality, Performance Quality, Must-be Quality, Neutral Quality, and Reverse Quality.[3] (See "Figure 1")

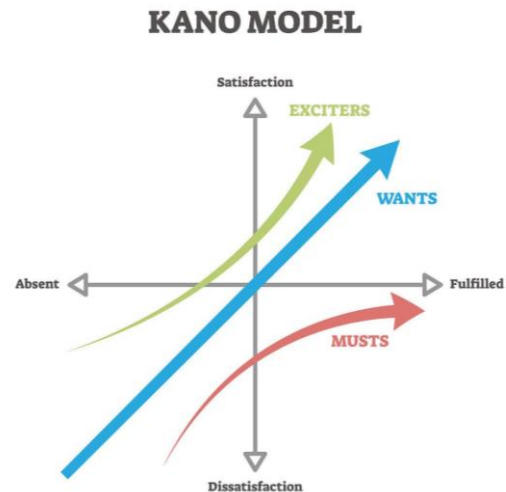


Figure 1 Kano model.

2. DESIGN OF THE RESEARCH PROCESS

The research process of this design is mainly divided into three stages, the first step is to determine and analyze the user's gender, age level, and cultural level by adopting the methods of user research and expert interviews to determine the main user groups and analyze the reliability of the data; the second step is to sort the design elements through the expert interviews, and screen and analyze the data and quality of the questionnaire according to the setting of the Likert scale; the third step is to categorize the user's actual needs through the previous questionnaires and statistical data, and rank them in terms of the weights.

2.1 Analysis of Target User Groups

Through the offline research on the relevant museums to understand the main consumer groups, it is found that the main consumer groups of the museum IP and its derivatives (related cultural creations) are inclined to be young have the corresponding cultural level, and know history and culture, and because of this, they are willing to

spend money on the inheritance of culture, and they are also willing to leave the museum IP-related products at home, so the main groups of the questionnaire are oriented to The main group of this questionnaire is oriented to the youth and customer groups with certain cultural connotation. Through expert interviews and a literature search, the author determines the more important design levels and elements in the museum IP image.

2.2 Analysis of Questionnaire Reliability

To deeply understand the users' needs for the IP image of the museum, this online questionnaire survey was used, with a total of 14 questions, to accurately understand the users' needs, of which 4 questions firstly investigated the information of the user group, and the other 10 questions used the Likert scale.

The reliability and accuracy of the responses in the attitude scale are often reflected by the alpha coefficient, when the alpha coefficient > 0.8 , it indicates a very reliable reliability; when the alpha coefficient is between 0.7-0.8, it indicates a relatively good reliability; when the alpha coefficient is between 0.6-0.7, it indicates a relatively average reliability; when the alpha coefficient is < 0.6 , it indicates a very unreliable reliability; the 100 sets of questionnaire The data were imported into the reliability analysis, and the standardized Cronbach α coefficient was obtained: 0.883, which proved the real reliability of the questionnaire data. A total of 105 sets of questionnaires were sent out, and after screening, 100 sets of them were valid questionnaires.

Data from the questionnaire show that there are slightly more women than men among the

respondents, accounting for 56.31%. In terms of the distribution of age levels, respondents aged 25-50 years old are the most, accounting for 52.43%, followed by those aged 0-25 years old, accounting for 39.81%, and there are fewer respondents aged 50 years old and above, accounting for only 7.77%. In terms of education level, respondents with master's degrees are the most, accounting for 35.92%, followed by bachelor's degrees, accounting for 39.81%, and respondents with doctoral degrees and above are the least, accounting for only 0.97%. This shows that the customer group is mainly between 0-25 years old, and the education level is between bachelor's degree and master's degree. In terms of spending on museum IP images and their derivatives, 31.07% of the respondents are willing to spend between 0-50 RMB, 26.21% of the respondents are willing to spend between 50-100 RMB, and 24.27% of the respondents are willing to spend between 100-200 RMB. Relatively few respondents were willing to spend more than 200 yuan, accounting for less than 20%. Through the survey, it is found that few users are willing to spend more than 100 RMB on IP image-related products, therefore, the selling price of IP image-related products should be set at 0-100 most reasonable RMB.

To summarize, it is ideal to set the main user group as women between the ages of 25 and 50 with bachelor's and master's degrees and to preset the sales pricing of the museum's IP pictograms and their derivatives at between 0 and 100 yuan.

2.3 Classification of User Requirements

The content of the expert interviews led to the categorization and numbering of the elements of user needs to produce the following "Table 1".

Table 1. User requirement element numbers

Attributes	serial number	Museum IP image needs
Emotional dimension	D1	Story content or meaning given by the times
	D2	Characterization
	D3	Exaggerated forms and expressions
	D4	Customized color scheme
Cultural dimension	D5	Period makeup
	D6	Period costume
Environmental dimension	D7	Incorporation of event-specific elements
	D8	Emoji packages
Practical dimension	D9	Posters
	D10	Related Derivatives

Table 3. Requirement attribute categorization result map

Summary of KANO model analysis results									
Functions/Services	A	O	M	I	R	Q	Classification result	Better	Worse
Contextualized by story or time period & No contextualized by story or time period	29.00%	19.00%	40.00%	8.00%	2.00%	2.00%	Must-be Quality	50.00%	-61.46%
Personality traits & no personality traits	40.00%	4.00%	2.00%	34.00%	1.00%	19.00%	Excitement Quality	55.00%	-7.50%
Exaggerated forms and expressions & Unexaggerated forms and expressions	22.00%	3.00%	2.00%	44.00%	9.00%	20.00%	Neutral Quality	35.21%	-7.04%
Customized Colorways & No Customized Colorways	37.00%	5.00%	1.00%	35.00%	2.00%	20.00%	Excitement Quality	53.85%	-7.69%
Period Makeup & No Period Makeup	31.00%	7.00%	2.00%	40.00%	3.00%	17.00%	Neutral Quality	47.50%	-11.25%
Ancient Style Clothing & No Age Ancient Style Clothing	25.00%	7.00%	2.00%	46.00%	3.00%	17.00%	Neutral Quality	40.00%	-11.25%
Specific Activity Element & No Specific Activity Element	30.00%	5.00%	1.00%	43.00%	3.00%	18.00%	Neutral Quality	44.30%	-7.59%
Emoticons & No Emoticons	30.00%	39.00%	8.00%	19.00%	2.00%	2.00%	Performance Quality	71.88%	-48.96%
Poster & No Poster	24.00%	5.00%	0.00%	50.00%	4.00%	17.00%	Neutral Quality	36.71%	-6.33%
Derivatives & No Derivatives	29.00%	40.00%	8.00%	20.00%	2.00%	1.00%	Performance Quality	71.13%	-49.48%

As the traditional Kano model method will ignore the influence of the original scale on the satisfaction of other attributes, thus appearing to analyze the results appears to be insufficiently intuitive, so the creation of the B-W four-image coordinate system, weighting fixed points, by calculating the corresponding coefficients and establishing the corresponding coordinates ("Figure 2"), you can be more intuitive to see the user for the museum's IP image demand weighting degree.

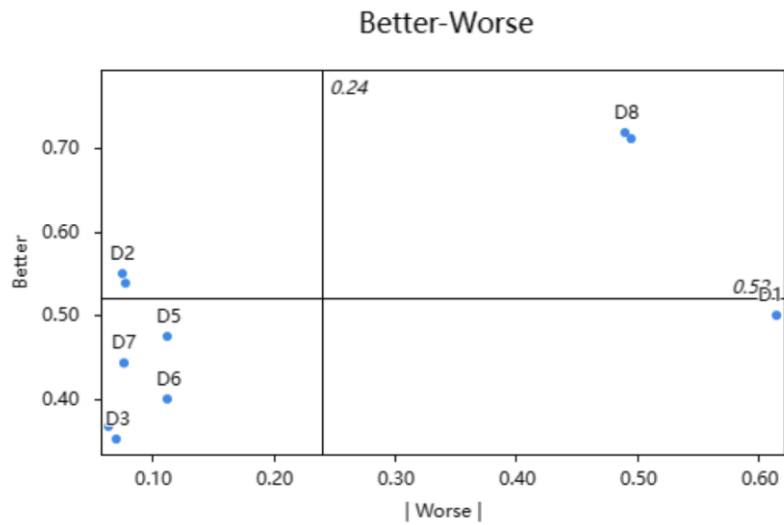


Figure 2 Coordinate diagram of Better and Worse coefficients.

In the B-W four-quadrant coordinate system, user needs are represented by the absolute value of the Worse (horizontal axis) and the Better value (vertical axis), thus clearly depicting the different need attributes. Specifically: the first quadrant represents the user's Performance Quality, where the requirements have a higher Better value and a higher absolute value of Worse. These requirements should be prioritized. The second quadrant demonstrates Excitement Quality, which is characterized by high Better values and low absolute Worse values. These needs should also be prioritized. The third quadrant deals with Neutral Quality, which are attributes characterized by low Better values and low absolute Worse values, and usually, these types of needs are not provided. The fourth quadrant, on the other hand, is concerned with Must-be Quality, and even though the Better value is low, these needs must be met due to the high absolute Worse value. When prioritizing user requirements, the general order is Must-be Quality > Performance Quality > Excitement Quality > Neutral Quality.

3. ANALYSIS OF RESULTS AND WEIGHTING OF USER REQUIREMENTS

Based on the data obtained and analyzed in Chapter 2, it is evident that out of the 10 user requirements in this study, there are 1 Must-be Quality requirement, 2 Performance Quality requirements, 2 Excitement Quality requirements, 5 Neutral Quality requirements, and no Reverse Quality requirements.

In the B-W four-quadrant coordinate system diagram, firstly, according to the importance of Must-be Quality demand in the fourth quadrant is greater than Performance Quality demand in the first quadrant, Performance Quality demand in the first quadrant is greater than Excitement Quality demand in the second quadrant, and the second quadrant is greater than Neutral Quality demand in the third quadrant, i.e., $M > O > A > I$. Excitement Quality requirements are greater than Neutral Quality requirements in the third quadrant, i.e., $M > O > A > I$. Prioritization is performed to obtain the results $D1 > D8, D10 > D2, D4 > D3, D5, D6, D7, D9$. Second, the requirements in each quadrant are prioritized by "Satisfaction S" to rank, satisfaction is the distance of each demand from the origin, the farther the distance, the higher the demand priority, on the contrary, the closer the distance, the worse the demand priority. According to the value of the horizontal and vertical coordinates of the user requirements in the B-W quadratic coordinate system diagram, "Table 4" is presented. Finally, the user requirements are reordered according to the order of attributes first and satisfaction second, which results in the following weighting order "Table 5".

Table 4. Satisfaction S

Demand	Horizontal coordinate (x)	Vertical coordinate (y)	Satisfaction (S)
D8	0.489583333	0.71875	0.869651311
D10	0.494845361	0.711340206	0.866531488
D1	0.614583333	0.5	0.792283203
D2	0.075	0.55	0.555090083
D4	0.076923077	0.538461538	0.543928293
D5	0.1125	0.475	0.488140605
D7	0.075949367	0.443037975	0.449500782
D6	0.1125	0.4	0.415519253
D9	0.063291139	0.367088608	0.372504784
D3	0.070422535	0.352112676	0.359085881

Table 5. Ranking of importance

Required Attributes	Order of importance
Must-be Quality	D1
Performance Quality	D8 > D10
Excitement Quality	D2 > D4
Neutral Quality	D5 > D7 > D6 > D9 > D3

The final conclusion is that $D1 > D8 > D10 > D2 > D4 > D5 > D7 > D9 > D3$. Therefore, when designing the IP image of a museum, the first step should be to consider the story connotation of the IP image of the museum or the meaning given by the era on the emotional level, the second step should be to consider the design of emoticon bag and related derivatives of the IP image of museum in the practical level, and the third step should be to consider adding some interesting designs to the IP image of museum in the emotional level, such as character portraits and customized attributes with color schemes. The third step should be to add some interesting designs to the museum IP image on the emotional level, such as character portraits and customized attribute color schemes.

4. THEORETICAL APPLICATION — ANALYSIS OF IP IMAGE "TANG NUI" IN SHAANXI HISTORY MUSEUM

As the IP image of Shaanxi History Museum ("Figure 3"), the key to the success of "Tang Nui" lies in its skillful integration of tradition and modernity, and its innovation based on history and culture.[5] Firstly, the visual image of "Tang Nui" originates from the Tang three-color figurines of ladies, and Xi'an's history and culture of the Tang

Dynasty provides a fertile cultural soil for the creation of the design of "Tang Nui". Secondly, through the integration of the characteristics of traditional Chinese painting and the expression of animation, "Tang Nui" shows a unique image that has both the charm of Chinese painting and fashionable elements. [6] In addition, "Tang Nui" is not only a cultural symbol of the Shaanxi History Museum but also an important IP image representative of Chinese traditional culture in the current "national trend" and "revival of traditional culture". In terms of derivatives, the Shaanxi History Museum is a major IP image representative of Chinese traditional culture. In terms of derivatives, the Shaanxi History Museum has developed a series of peripheral products based on the theme of "Tang Nui", such as dolls, pillows, fans, cell phone cases, refrigerator stickers, key chains, and so on. ("Figure 4" "Figure 5"), these products not only strengthen the impression of "Tang Nui" as the spokesperson of the museum but also effectively promote the economic income of the museum. Finally, "Tang Nui" has been authorized to cooperate with products in many industries, and its popularity and influence have been further enhanced. All these have enabled "Tang Nui" to attract more young people to enter the museum to understand and appreciate the traditional Chinese culture.



Figure 3 Shaanxi History Museum IP image "Tang Nui".



Figure 4 "Tang Nui" Keychain.



Figure 5 Tang Nui dolls and pillows.

Although the IP image of Shaanxi History Museum "Tang Nui" has made remarkable achievements in many aspects, there are still some shortcomings in some aspects, and to make "Tang Nui" achieve better results in the future, it is necessary to pay attention to the following aspects.

According to the results of the above analysis, it is crucial to incorporate the connotation of the story and the meaning given by the times in the design of museum IP characters. This can not only enhance cultural communication, and make the audience resonate with the cultural values and historical stories, but also make the IP image jump out of the category of traditional cultural heritage carrier, and become an indispensable "small staff" in the museum with flesh and blood. Secondly, the IP image of the museum should be launched promptly and continuously with emoticons and cultural

derivatives. Emoticons, as one of the popular network communication methods, can enhance the interaction between the crowd and the IP image of the museum, and also deepen the crowd's impression of the IP image of the museum, which is a "bonding rope" between the users and the museum and the IP image. The IP image of cultural derivatives is the best business card for the museum's external publicity, arousing the curiosity of unfamiliar users for the museum, to achieve the purpose of attracting traffic, but also to bring economic benefits for the museum. Finally, it is necessary to add custom color schemes and special character traits to the IP image of the museum. Incorporating different custom color schemes and different character traits can add fresh blood to the IP image of the museum, change the stereotypical impression of the IP image, and increase the multiplicity of the IP image. [7]

Therefore, in the subsequent development of "Tang Nui", first of all, we should adjust and change the connotation of the story and the meaning given by the times, update and push the emoticons and related cultural derivatives on the public platform at regular intervals, and pay attention to increase the customization service of "Tang Nui" for the customers.

5. CONCLUSION

This article takes the museum IP image as the research object, and the conclusion is applied to the IP image of Shaanxi History Museum "Tang Nui" for the secondary feedback, using the feedback data from the preliminary research, combining the method of Kano model to determine the user's most real demand for the museum's IP image, and prioritizing the user's needs through the combination of the Kano-BW model, combining with the secondary feedback of "Tang Nui" to validate the conclusion, to provide the data and theoretical support for the subsequent designers to carry out the design of the museum's IP image, as well as to provide the existing museum IP image with a new way of thinking to change and innovate.

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