Research on Village Home-Stay Environment Design Based on KANO Model

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Abstract. Objective To explore the potential demand of consumer for village home-stay environmental design by using KANO model. Method Using a combination of qualitative and quantitative research methods, using text mining tool ROST CM and visualization software NETDRAW for desktop research, combining literature research and user interviews, constructing a village home-stay environmental design indicator system, designing KANO questionnaires for data collection, using statistical software SPSS Perform data statistics and analysis with EXCEL, and get the KANO attributes of various demand indicators. Conclusion In the service demand of village home-stay, there are 9 “attractive needs” (accounting for 45%), 5 “must-be needs” (accounting for 25%), and 6 “Undifferentiated needs” (accounting for 30%), no "one-dimension needs ". Among them, characteristic decoration (0.755), taste and style (0.691), "home" atmosphere (0.613), and smart home (0.607) are important factors in the environmental design of village home-stay. This study provides theoretical reference for the environmental design and management development of village home-stay.

Keywords: environmental design, KANO model, village home-stay.

1 Introduction

Village home-stay is an accommodation facility with small scale in villages to provide tourists with chances to experience local natural and cultural landscape and local production and life. It plays an important role in village travel and embodies local culture in villages. In the context of poverty alleviation and village home-stay in China, there are some high-quality village home-stay with good reputation, which has promoted village travel and other service industries. However, as the village home-stay is still at the primary stage as a whole, the overall service quality is intermingled and imbalanced. With the rapid development of village travel and the improvement of tourists’ demand for the quality and service of village home-stay, it is requested that the village home-stay needs to focus on the demand of tourists and the influence of demand indicators at different levels on tourists’ satisfaction of village travel when developing and improving its service. These efforts aim to accelerate the upgrading of village travel from sightseeing to deep experience and the fast development of the building of “Beautiful Villages” and new urbanization. In recent years, many scholars at home and abroad have discussed and explored village home-stay. The hot issues are mainly the status and trend of home-stay industry, the choices of home-stay tourists, and the influencing factors of the

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attractiveness and tourists' satisfaction of village home-stay. For example, Rasoolimanesh et al. [1] used the Partial least squares structural equation model to demonstrate the significantly positive effects of the customer perceived value on tourists' satisfaction of the village home-stay including functional value, emotional value and social value. Voon et al. [2] combined the methods of focus group and questionnaire survey to investigate tourists' experience of the village home-stay, and measured the tourists' satisfaction from nine dimensions such as culture, tour guides, accommodation, service, food and drink, travel, natural environment, channels and sanitation. Based on the structural equation model, Dey et al. [3] discussed the influence of tourists' travel destination and their travel motivation on the way they choose village home-stays. The result of Dey's research showed that cultural and village scenic spots, and the location and transportation were the two attractive factors of travel destination, and the two factors were significantly correlated to the choice of village home-stays. In China, the related researches on home-stay mainly combine application and cases, with discussion angles including the status, development strategies, evaluation and satisfaction of service quality, and design aesthetics. For instance, Wu et al. [4] analyzed the business model and development of village home-stays in ethnic regions under the background of sharing economy, and combined empirical research to demonstrate the influence of the number and policies of village home-stays as well as the number of trips on the village travel income in ethnic regions. Li et al. [5] explored the relationship between regional culture and the landscape design of village home-stays in the context of rural revitalization by taking village home-stays in Hangzhou as an example and then summarized the methods and potential problems of designing the landscape of village home-stays. This paper will develop an indicator system for the environmental design of village home-stays based on the KANO model theory and from the viewpoint of tourist needs, providing theoretical support and a frame of reference for the design, development, management decision-making, and enhancement of service quality of village home-stays.

2 Research approach and method

The technical route of this study is shown in Figure 1. Firstly, a large number of comments were extracted from the village home-stay booking platforms of major tourism websites, and high-frequency word network analysis was carried out by using text mining tool ROST CM and visualization software NETDRAW to extract the relevant evaluation indicators of homestand environmental design. Then, combining literature research and user interviews, the index system of homestand environmental design was constructed. Based on this, the questionnaire of village home-stay was designed based on KANO model, and the questionnaire was distributed and data collected. According to the data statistics and analysis results, corresponding suggestions and conclusions were put forward to improve the environmental design quality of village home-stay and tourists' satisfaction.

KANO Model originated from the two-factor theory in behavioral science and it was put forward by Professor Noriaki Kano et al. from Tokyo University of Science. It was the first time that the satisfaction and dissatisfaction factors had been introduced into the field of quality management. Five influencing factors that affect satisfaction were defined (Figure 2), namely must-be (M) needs, one-dimension (O) needs, attractive (A) needs, Undifferentiated (I) needs, reverse (R) needs.

At present, the model has been widely applied in the academic research in the social sciences, including pedagogy, management science, and medicine, etc. There is also a large number of documents in design science and they have applied and explored KANO Model from different angles[6-9], mainly in the innovative design and satisfaction research of products, packaging, interactive interface and other directions, and few studies have been carried out in combination with the environmental design of village home-stay accommodation, while the excellent, benign and targeted environmental quality is an important factor affecting the experience of village home-stay. Therefore, this study applies KANO model method to the environmental design thinking of village home-stay, screens and classifies tourists' demands, and realizes the accurate allocation of environmental design accordingly, providing theoretical basis and reference for environmental designers and operation managers.

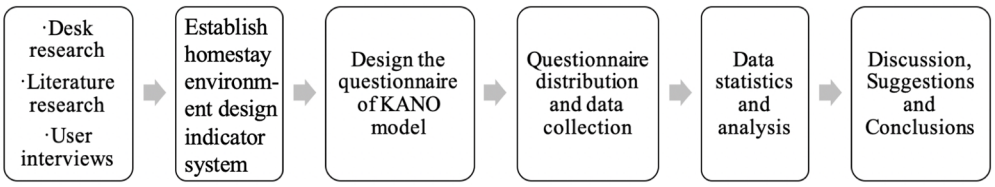

Fig. 1. Research design

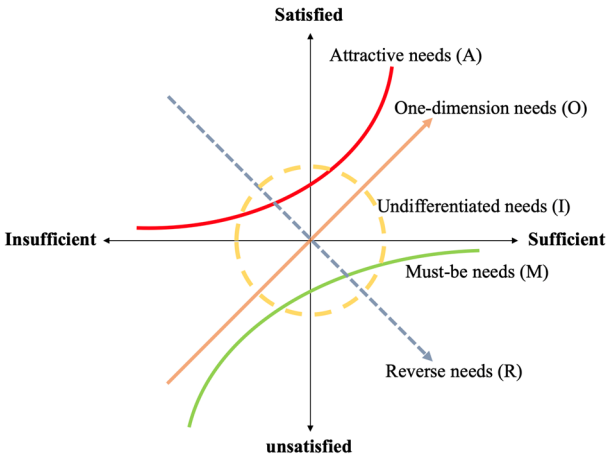

Fig. 2. KANO Model

3 Research process

3.1 Desk research

In this desk research, 608 comments were extracted from popular travel websites and platforms including Ctrip, Tuniu Travel, Meituan, Qunar, etc. Zhuhai is where samples were selected and the overall comment is above the score of 4.5. Text mining tools like ROST CM and visualized software like NETDRAW were used to analyze the network of high frequency words. Among these words, some have similar meanings, like “Shufu” and “Shushi” (meaning comfortable), “Zhoubian” and “Fujin” (meaning surrounding places), “Laoban” and

"Fangdong" (meaning the person who provides accommodation), "Bianli" and "Fangbian" (meaning convenient), "Ganjing" and "Zhengjie" (meaning clean), and these words can be integrated into one word, respectively "Shushi", "Zhoubian", "Laoban", "Bianli" and "Zhengjie". Besides, the words that are not relevant to the comments on the village home-stay were deleted, such as "Ruzhu", "Difang", "Fenzhong" and "Zhejia", etc. Finally, the semantic graph of high frequency words and visualized network (Figure 3) was obtained. The bigger the point, the higher the frequency of the word. Seen from the figure, the physical demands which tourists concern most in a village home-stay are room sanitation, convenient transportation, service attitude, room facilities, price-performance ratio, room style, surroundings, breakfast and parking lots. Besides, the sentimental demands that tourists concern most are cleanness, convenience, enthusiasm, completeness, quietness, consideration, spaciousness, warmth and sweetness.

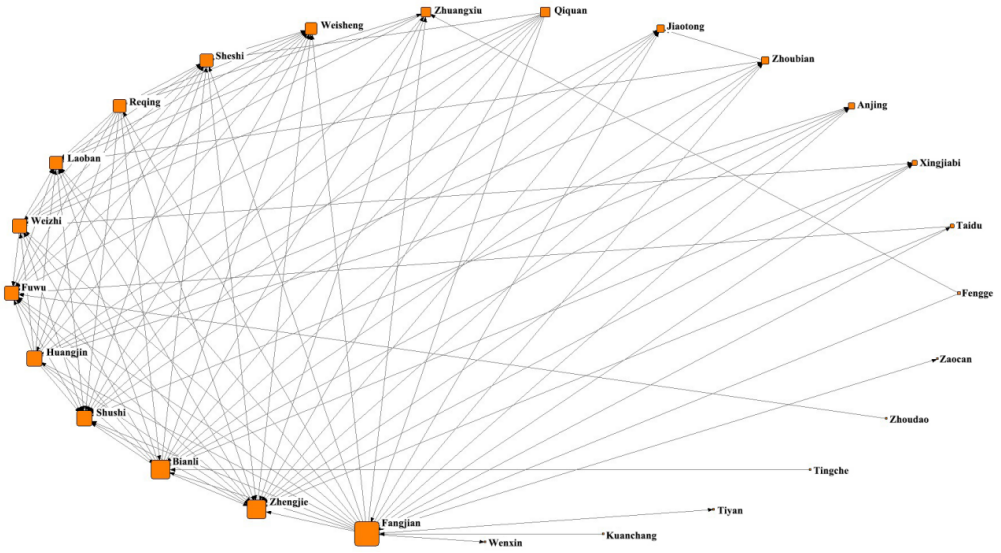

Fig. 3. The semantic graph of high frequency words and visualized network

3.2 Questionnaire design

To ensure the reliability and validity of questionnaire designing, we pointed out in this research that the observed variable and demand indicator should refer to authoritative documents at home and abroad. Then, we integrated the desk research and interviews with users, and a design indicator system of village home-stay environment was obtained (Table 1). It was found in the research process that the demand for safety appeared more frequently in the document research while this kind of demand was less referred in the online comments. The demand for "quiet and comfortable" and "free parking" appeared less in the document research while these words were highly used in the online comments. Therefore, the three demands of safety, quietness and comfort, and free parking were applied to the questionnaire as variables to be verified in this research. Then, four scopes, namely the demand for accommodation, service, feelings and other demands, were listed to discuss. A total of 20 core survey items presented in pairs. According to the requirements of KANO questionnaire, the

question of each demand indicator is composed of pros and cons (Table 2). Besides, based on the KANO two-dimensional attribute evaluation table to count the frequency of each service demand, there were a total of 25 permutations and combinations of options for each question (Table 3).

Table 1. Design indicator system of village home-stay environment.

Indicator types	Environmental design indicator	Literature sources
Residential demand	Cleanness, quiet and comfortable Complete facilities Convenient transportation Beautiful surroundings Abundant tasty food Unique decoration Intelligent house Free parking	N. Gunasekaran [10] Wang, etc[11] Desktop research for high-frequency words
Service demand	Special activities Breakfast service Pick-up service Tour recommendations Online reservation and payment	Lu , etc[12] Ding[13]
Emotional demand	Unique dressing Taste and style Atmosphere of home	N. Gunasekaran [10]
Other demand	High price-performance ratio Security and normality Good online comments Branding operation	N. Gunasekaran [10] Wang, etc[11] User interviews

Table 2. KANO model questionnaire example.

If this service is provided, what do you think:	If this service is not provided, what do you think:
(1) really like	(1) really like
(2) like	(2) like
(3) neutrality	(3) neutrality
(4) barely accept	(4) barely accept
(5) dislike	(5) dislike

Table 3. The KANO two-dimensional attribute evaluation table**.**

Design indicator Scale		Negative question				
		really like	like	neutrality	barely accept	dislike
Positive question	really like	Q	A	A	A	O
	like	R	I	I	I	M
	neutrality	R	I	I	I	M
	barely accept	R	I	I	I	M
	dislike	R	R	R	R	Q

Note: The A is “attractive needs”, the O is “one-dimension needs”, the M is “must-be needs”, the I is “Undifferentiated needs”, the R is “reverse needs”.

3.3 Statistical data and analysis

3.3.1 Test on Reliability and validity

This questionnaire was undertaken in the online platform of WJX (https://www.wjx.cn/), and a total of 136 copies were distributed. By eliminating 24 invalid questionnaires with short answering time or obvious problems, a total of 112 valid questionnaires were obtained. The valid questionnaire response rate was 82.4%. There were 39 males and 73 females who completed the questionnaire, respectively accounting for 34.2% and 65.2%. The statistical software SPSS was used to test the reliability and validity of the 40 demand index questions in the questionnaire (Table 4). The Cronbach's coefficient a was 0.873 (>0.7), indicating a high level of reliability, and the survey data was true and credible. The KMO value was 0.730 (>0.6) and the sig value was 0.000 (<0.05), indicating that the questionnaire had a good structural validity.

Table 4. The testing of validity and reliability.

Cronbach's Alpha	items	Kaiser-Meyer-Olkin metric	Bartlett's sphericity test		
			Approximate chi-square	df	Sig.
.873	40	.730	1830.333	780	.000

3.3.2 KANO attributive classification and prioritization

Based on KANO Model, the environmental design index of village home-stay accommodation was classified and classified in two dimensions (Table 5). Besides, it calculated the Better-Worse coefficient according to the frequency value in each demand indicator, and used the absolute value of Worse coefficient as the abscissa and the Better value as the ordinate to draw a quartile chart of the Better-Worse coefficient analysis of the environmental design indicators of village home-stays in Excel (Figure 4). The quartile chart divided the vertical and horizontal coordinates into four quadrants with 0.5 as the dividing line. According to the first quadrant value Better>0.5, |Worse|>0.5, it is the one-dimension needs. When the second quadrant value Better>0.5, |Worse|<0.5, it is the attractive needs. When the third quadrant value Better<0.5, |Worse|<0.5, it is the Undifferentiated needs. When the fourth quadrant takes Better<0.5, |Worse|>0.5, it is the must-be needs [14]. Finally, the landing quadrant and priority of each demand indicator were obtained.

The statistical results showed that in the design of village home-stay environment, there were 9 attractive needs (accounting for 45%), 5 must-be needs (accounting for 25%), and 6 Undifferentiated needs (accounting for 30%), and no one-dimension need was found. In the designing idea of village home-stay service, it can be sorted according to the priority of the KANO model in the order of "must-be needs> one-dimension needs> attractive needs> Undifferentiated needs". The must-be needs are “cleanness, quietness and comfort”, “complete facilities”, “online reservation and payment”, “security and normality”, “good online comments”, showing that they are what customers think a village home-stay should provide as “must-be” needs. The attractive needs are beautiful surroundings, unique decoration, intelligent house, special activities, pick-up service, tour recommendations, taste and style, atmosphere of home and a high price-performance ratio. In these attractive needs, priority to a high Better value can reach better effects; improving the quality of these services can both eliminate customers' dissatisfaction of and increase their satisfaction [15]. Undifferentiated

needs include free parking, branding operation, unique dressing, breakfast service, convenient transportation and abundant tasty food, which will not affect customers' living experience by and large. Instead, they can be the opportunities of cost saving.

Table 5. The design indicator classification of village home-stay environment.

Indicator types	No.	Environmental design indicator	Frequency						KANO attribute	Satisfaction coefficient	dissatisfaction coefficient
			A	O	M	I	R	Q		Better	Worse
Residential demand	1	cleanness, quiet and comfortable	15	8	53	34	1	1	M	0.209	-0.555
	2	complete facilities	18	2	59	31	0	2	M	0.182	-0.555
	3	convenient transportation	47	5	17	41	0	2	I	0.473	-0.200
	4	beautiful surroundings	49	10	9	43	0	1	A	0.532	-0.171
	5	abundant tasty food	44	9	17	41	0	1	I	0.477	-0.234
	6	unique decoration	77	6	8	19	0	2	A	0.755	-0.130
	7	intelligent house	56	12	18	26	0	0	A	0.607	-0.268
Service demand	8	free parking	23	5	46	36	1	1	I	0.255	-0.464
	9	special activities	62	4	9	36	1	0	A	0.595	-0.117
	10	breakfast service	49	3	20	40	0	0	I	0.464	-0.205
	11	pick-up service	55	11	13	32	1	0	A	0.595	-0.216
	12	tour recommendations	52	7	12	39	0	2	A	0.536	-0.173
	13	online reservation and payment	19	6	64	22	0	1	M	0.225	-0.631
Emotional demand	14	unique dressing	34	1	5	71	1	0	I	0.315	-0.054
	15	taste and style	68	8	15	19	1	1	A	0.691	-0.209
	16	atmosphere of home	64	4	10	33	1	0	A	0.613	-0.126
	17	high price-performance ratio	49	9	12	40	1	1	A	0.527	-0.191
Other demand	18	security and normality	8	20	65	19	0	0	M	0.250	-0.759
	19	good online comments	29	9	47	26	0	1	M	0.342	-0.505
	20	branding operation	29	1	8	71	2	1	I	0.275	-0.083

Note: Satisfaction coefficient Better/SI=(A+O)/(A+O+M+I), dissatisfaction coefficient Worse/DSI= -1 *(O+M)/(A+O+M+I)

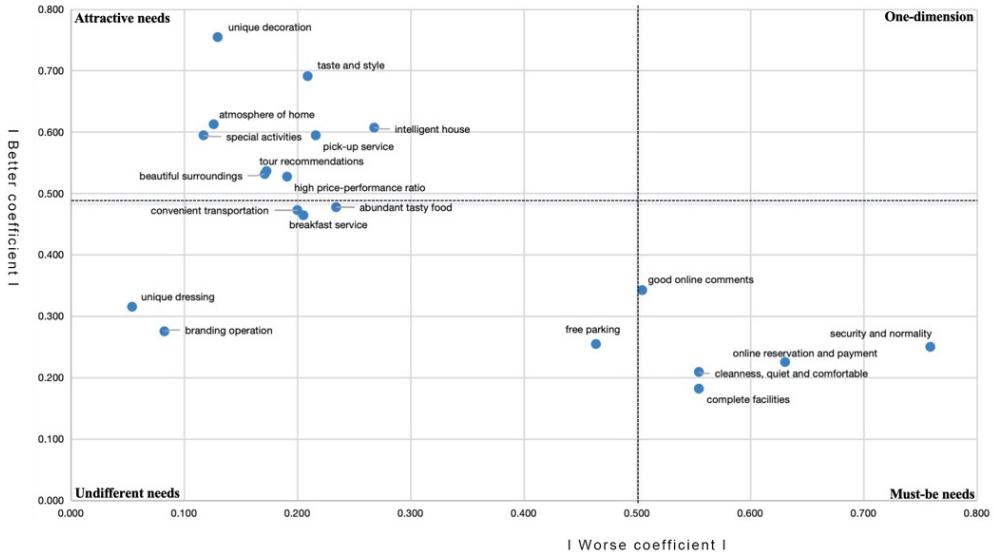

Fig. 4. The quartile chart of the Better-Worse coefficient analysis of residential environment design indicator

4 Discussion and analysis

According to the calculating result by Better-Worse coefficient, unique decoration (0.755), taste and style (0.691), atmosphere of home (0.613) and intelligent house (0.607) have a more significant influence on village home-stay environment design. At present, environment design of village home-stay in China are facing such problems as a lack of regional culture characteristics and cultural atmosphere. Regional culture has experienced a long history, featuring originality and uniqueness [16]. In the idea of designing village home-stay, it is not advised to simply use the evaluation standards of high-end hotels in cities. Instead, regional culture elements should be combined with the buildings, internal room and decorations of village home-stay to enable tourists to experience local culture and provide them with local and authentic accommodation services. Village home-stay should not only let tourists feel the comfort of the living function, but also be equipped with aesthetic function and emotional function. Therefore, in terms of designing the style of village home-stay, a distinct theme and aesthetic connotation should be considered to show a unique taste and style as well as good life attitudes. Besides, a fine quality of furniture, designing and service should be taken into account to provide an atmosphere of home. In addition, traditional and modern styles need to be combined, and modern intelligent household facilities and technologies should be introduced according to the room's characteristics, so as to improve the living quality of village home-stay and satisfy the modernized demand for consumer groups of village travel [17].

The limitation of this study is that due to the long and repetitive content of KANO questionnaire, the quality of the collected data may decline, and the data need to be carefully screened in the post-processing. Other scientific research methods can also be added in the

follow-up research to calculate the evaluation weight of various design indicators, so as to assist the village home-stay operators or designers to make more scientific decisions, so as to create valuable and high-quality Village home-stay's environment and improve tourists' satisfaction.

5 Conclusions

With regard to the environment design of village home-stay, in-depth study of customer needs is essential to gain competitive advantage. Based on the KANO model theory and from the perspective of consumer demand, this study explores the classification of design indicators, KANO attributes and importance ranking in the environmental design of village home-stays, identifies and screens out different needs, pays attention to the attractive needs and one-dimension needs that can improve tourists' satisfaction, ensures the quality level of must-be needs, and eliminates the Undifferentiated needs. Finally, from the qualitative point of view, the environmental design strategy of village home-stays is put forward. Under the guidance of this method, designers can accurately design and develop key needs in combination with the current situation of time and resource allocation in the actual village home-stay environment, which has positive significance for improving tourists' stay experience and improving rural tourism service quality, and also provides theoretical reference for the environmental design and management development of village home-stay.

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References

[1] R.S. Mostafa, D. Norziani, J. Mastura. Journal of Hospitality and Tourism Management. 26, 72-81(2016)

[2] V. Boo-ho, H. Jamil, J. Patricia-melvin, et al. International Journal of Geomate. 12, 96-100(2017)

[3] D. Banasree, M. Jones, C. Chee-hua. International Journal of Culture Tourism and Hospitality Research, 4, 639-666(2020)

[4] W. Song-kai, Z. Chi.Journal of Guangxi University (Philosophy and Social Science), 2, 46-52(2021)

[5] L. Shan, Q. Den-yin. Art Panorama, 2, 162-164(2021)

[6] C. Zhao-jie, L. Yuan, Z. Kang-jie, L. Jiang-yu, Y. Yu. Packaging Engineering, 10, 130-137(2019)

[7] F. Yue-feng. Zhuang Shi, 11, 124-125(2019)

[8] Y. Da-li. Packaging Engineering, 16, 147-153(2020)

[9] L. Chun-fu, X. Zi-hao, F. Xiao-yun. Packaging Engineering, 20, 91-96(2020)

[10] G. N, A. Victor. Procedia-Social and Behavioral Sciences, 62, 1127 - 1132(2012)

[11] W. Hui-lin, W. Meng-ying. Chinese Journal of Management, 3, 433-438(2015)

[12] L. Hui-juan, L. Xiang. Areal Research and Development, 1, 112-117(2020)

[13] D. Fei-yang, G. Qing-mei. Social Science Front, 3, 254-258(2019)
[14] Y. Sen-lin, C. Qian. Packaging Engineering, 1-12(2021). (to be published)
[15] W. Chen-sheng. User experience and system innovation design, Beijing: Tsinghua University Press (2018)
[16] W. Wei-guang. Art Observation, 1, 8-9(2015)
[17] Y. Zheng-gang, L. Heng, W. Dong. Guizhou Ethnic Studies, 7, 139-144(2020)