Research on Packaging Design of Regional Public Brand Based on "Internet+"

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Abstract. This paper takes Suichuan County, Ji'an City, Jiangxi Province regional public brand "Tian Yuan Sui Yue" brand packaging design as an example, comprehensively analyzes and interprets the current problems and solutions of regional public brand packaging design research under the background of "Internet + rural revitalization" strategy. Through the presentation of the data model and data analysis, the design of the packaging of agricultural products is given scientific and accurate, and the competitiveness of the brand is built and the satisfaction of the users is improved from the perspective of packaging design, which provides a reference basis for the subsequent development of packaging design.

Keywords: Internet +; rural revitalization; KANO model; regional public brand; brand design

1 Introduction

In recent years, with the continuous progress of consumption patterns and concepts, "Internet+" has enabled regional public brands to flourish and inject new vitality into poverty eradication and rural revitalization. It has become a huge driving force for the growth of rural economy by boosting the speed of rural poverty eradication and promoting rural revitalization. With the main purpose of design across the border, the "Internet + design" model is proposed to establish a new route of marketing regional public brand products with design for the people and precise policy. The paper introduces the new method of design to help poverty alleviation, rural revitalization and sustainable development of rural cultural heritage for the public.

Through literature analysis method, we collected and sorted out the literature on domestic rural agricultural products marketing mode and rural product branding design under the background of "Internet+", and searched 4,424 pieces of literature on the topic of "agricultural products marketing". The search revealed that there were 4,424 articles on "agricultural products marketing", 1,886 articles on "Internet + rural", and only 16 articles on "Internet + regional public brand design". It is understood that most of the marketing modes of agricultural specialties are still based on traditional offline direct sales and general e-commerce sales mode, and the online agricultural product brand marketing mode using "Internet + design" is on a less and slower rise. There are still many problems such as value disconnect, cultural disconnect and technical disconnect in the whole agricultural products sales channel system.

Implementation of "'Internet+' agricultural products out of the village into the city project". The study of regional public brands provides policy support for the study is also a key step in

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the rural Internet, for the establishment of e-commerce platform coverage and popularity is a strong agent to effectively promote the development of modern rural economy and improve the living standards of farmers. This study takes "Tian Yuan Sui Yue", a regional public brand established in Suichuan County, Ji'an City, Jiangxi Province, as an example. By using the technology of "Internet + Big Data" to support the complex information technology and network system, the study integrates all issues related to the creation and innovation of regional public brands, such as the circulation of agricultural products, operation and management, distribution and transportation, etc., so that the development of regional public brands circulates in an orderly manner at all agricultural levels in a cross-flow mode. The regional public brand development is a cross-flow model that circulates in an orderly manner at all levels of agriculture, actively and effectively linking farmers with the market and providing farmers with comprehensive and clear information support. Through the regional public brand "Tian Yuan Sui Yue" covering the city and Jiangxi area agricultural products production and processing enterprises and trade circulation enterprises and other agricultural-related business entities to provide trade products upstream and downstream related services, with strong unions, urban-rural unions, large supermarket unions and Internet unions as the main line, to establish a modern online and offline integration development covering urban and rural areas. The modern trade circulation network covering urban and rural areas with online and offline integration is established.

Finally, using the basic theories of hierarchical analysis and KANO model, we investigate and analyze the consumer demands existing in the design of agricultural products packaging, and establish the corresponding index weight system, generate the design priority order of importance of key indexes, and establish the demand evaluation index weights by analyzing the order of functional demands, so as to propose the corresponding agricultural products packaging design strategies. Starting from rational design, it gives scientificity and accuracy to the packaging design of agricultural products, creates brand competitiveness and enhances user satisfaction from the perspective of packaging design, and provides a reference basis for the subsequent packaging design development.

2 New path of regional public brand e-commerce in the context of "Internet+"

2.1 Overview of agricultural product packaging design

With the increasing degree of commercialization of agricultural products in China, the establishment of regional brands is the way to promote development [1]. However, agricultural products packaging design market has not received sufficient attention, on the one hand, agricultural products packaging presents excessive packaging; on the other hand, it presents rough and simple packaging, lack of creativity in packaging, which cannot be well transformed into economic benefits.

Several Opinions of the State Council on Promoting the Integrated Development of Cultural Creativity and Design Services and Related Industries, issued by the State Council in 2014, clearly states that "focus on the excavation of rural cultural resources, constantly enrich the creativity and design of agricultural products, agricultural landscape, environmental protection

packaging, and vernacular culture, make efforts to cultivate a number of well-known brands of leisure agriculture, enhance the added value of agricultural products, and promote the creative and design products industrialization" [2]. National policies have begun to pay attention to the important role of design in promoting the construction of regional public brands, agricultural packaging design, and local economic development.

2.2 Agricultural product information data

Through the construction of e-commerce platform, the whole region is linked as a whole, and the Internet information technology is used as a fulcrum to link the production, sales, product circulation, operation and management, logistics and transportation of regional agricultural products to help the creation of regional public brand, so that the development of regional public brand interacts with each other at all levels in an orderly, two-way circulation. This research joint Suichuan County People's Government to build Suichuan County e-commerce public service center Suichuan specialties O2O online shopping experience hall, "Internet + green water and green mountains" to promote the development of Suichuan red and green ancient color. By creating and cultivating the regional public brand "Tian Yuan Sui Yue" and building Suichuan agricultural products online poverty alleviation pavilion, we will promote the development of rural e-commerce, enhance brand influence and bring more agricultural products to the market through "Tian Yuan Sui Yue". See Fig. 1.

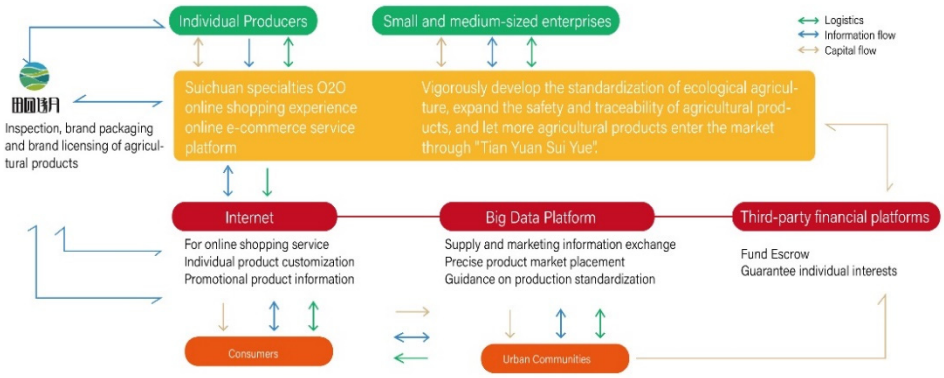

Fig. 1. Project flow chart

3 Countermeasures of "Internet + design" to help upgrade regional public brands

3.1 Establish the symbolic language of regional public brand

Visual communication design is the surface expression of visual image recognition, the first and most intuitive form of perception for the public, and its core is logo design [3]. Creative design using the latest computer software Adobe Illustrator 2022 (AI for short), a powerful vector graphics processing software, the software includes the new Adobe Mercury Performance System, which supports 64-bit native systems can perform tasks such as opening Ado-

be Illustrator 2022 is a powerful vector graphics processing software, the software includes the new Adobe Mercury Performance System, which supports 64-bit native system can perform tasks such as open, save and export large files and preview complex designs, while having greater memory support and more computing power. The Suichuan County regional public brand logo is designed as a circle, which represents the sun, signifying that the sun shines on the village's 10,000 mu of land, to reflect the natural roundness and harmony of rural life. Green, blue and yellow are used in the color, representing the sky, the earth and the fields respectively, signifying the natural, healthy and vibrant nature of the land, and also emphasizing the agricultural attributes, thus enhancing the communication value of the brand sign, Se Fig. 2.

Fig. 2. "Tian Yuan Sui Yue" brand design

3.2 Analysis of agricultural products packaging demand research based on KANO model

The Kano model was originally proposed by the Japanese scholar Noriaki Kano as a tool to study customer needs. In it, charisma needs, expectation needs and essential needs represent five different levels of customer need types. Attractive Needs (A), Desired Needs (O), Essential Needs (M), Undifferentiated Needs (I), and Reverse Needs (R). At present, Kano model has become an important design method, through the application of Kano model, to establish the relevant evaluation index weights, according to which to provide ideas for brand packaging design.

Based on the theory of KANO model, the indexes of evaluation of consumer demand elements of agricultural products are established after summarizing the consumer demand, and the design elements that can better meet the user demand are organized and excavated. See Table 1 for details.

Table 1. Classification of consumer demand elements

Serial number	Demand element	Serial number	Demand element
1	Pattern design	9	Useful Features
2	Text recognition	10	User Experience
3	Appearance color	11	Green
4	Customization	12	Certification Label
5	Locality	13	Structure
6	Craftsmanship	14	Material
7	Window design	15	Cost-effectiveness
8	Specification Size		

3.3 Questionnaire design and survey

The KANO model questionnaire was two-dimensional. A total of 130 questionnaires were distributed, of which 60 were filled out online and the remaining 70 were filled out offline. Excluding invalid questionnaires, there were 111 valid questionnaires, with an effective rate of 87.69%.

According to the cross-tabulation analysis of the survey data, the percentage of KANO attributes (i.e. affiliation degree) of KM, KO, KA and KI in all samples, and after excluding the reverse demand (KR) and suspicious results, the demand attribute classification of each agricultural packaging design index can be obtained from the survey results. See Table 2 for details.

Table 2. KANO attributes of evaluation metrics

	Evaluation indicators	Affiliation				Dmand Properties
		KM	KO	KA	KI	
1	Graphic design	0.3947	0.0263	0.1228	0.3860	M
2	Text identification	0.3772	0.0702	0.0965	0.3684	M
3	Appearance color	0.1930	0.2193	0.1667	0.3596	I
4	Customization	0.0789	0.0263	0.0965	0.6404	I
5	Locality	0.0439	0.0263	0.4561	0.3860	A
6	Craftsmanship	0.0439	0.0614	0.0702	0.7193	I
7	Window design	0.0614	0.0880	0.3334	0.4386	I
8	Specification size	0.1228	0.0526	0.0526	0.6667	I
9	Practical Function	0.0614	0.0526	0.4386	0.3070	A
10	User Experience	0.1316	0.0263	0.0877	0.6842	I
11	Green	0.1228	0.0263	0.0789	0.7105	I
12	Certification Label	0.1667	0.0702	0.3334	0.3772	I
13	Structure	0.2895	0.0526	0.1053	0.4386	I
14	Material	0.1667	0.0439	0.0965	0.5614	I
15	Cost-effectiveness	0.0965	0.0351	0.0614	0.6930	I

A quantitative KANO model was constructed and the weights of each category affiliation in the KANO model were established by applying the hierarchical analysis (AHP). The specific steps are as follows.

① Construct the decision matrix A=（a_{ij}）$_{(m\times n)}$.Let the importance of n requirement items be evaluated by m users, and aij is the rating of the jth requirement item by the i-th user, so as to build the decision matrix A.

② Normalize the decision matrix A. Normalize each column element of the decision matrix, where B=（b_{ij}）$_{m\times n}$，$b_{ij}=a_{ij}\frac{a_{ij}}{\sum_{i=1}^{m}}$,i=1，2，…，m，j=1，2，…，n.

③ The normalized matrix is summed by rows to obtain the column matrix, where $\varpi=\sum\frac{n}{i=1}b_{ij}$，i=1，2，…，m，j=1，2，…，n.

④ The weight vector is obtained by dividing the summed vector by n, i.e., W=（w_i）$_{n\times 1}$, where $w_i=\frac{\varpi}{n}$.

⑤ The maximum characteristic root is calculated as $\lambda max=\sum_{i=1}^{n}=\frac{(AW)_i}{w_i}$.

⑥ Consistency test is performed. The consistency index of the judgment matrix A is $CI=\frac{\lambda_{max}-n}{n-1}$, and the consistency ratio index is $CR=\frac{CI}{RI}$, where RI is the average random consistency index, and its value can be queried from Table 3 When CR < 0.1, A is said to have a consistency matrix.

Table 3. Standard values of average stochastic agreement index RI

Order	1	2	3	4	5	6	7	8	9	10
RI	0	0	0	0.58	0.89	1.12	1.24	1.41	1.45	1.49

Based on the above steps, a judgment matrix is constructed based on the membership degree of the demand attributes of the 15 evaluation indicators in Table 2, a judgment matrix with the membership relationship of the demand attributes of the evaluation index is constructed and normalized according to the column, the membership value of each evaluation index in the normalization matrix is multiplied by the evaluation index attribution weight, and then the values in the same row of the matrix are added, and finally the sum vector is divided by n to obtain the final weight vector, and then the maximum mother feature root is obtained and the matrix consistency test is performed. Verdict matrix A

$$A=\begin{bmatrix}0.394\ 7 & 0.026\ 3 & 0.122\ 8 & 0.386\ 0\\ 0.377\ 2 & 0.070\ 2 & 0.096\ 5 & 0.368\ 4\\ \vdots & \vdots & \vdots & \vdots\\ 0.166\ 7 & 0.070\ 2 & 0.333\ 4 & 0.377\ 2\end{bmatrix} \quad (1)$$

The matrix A is normalized to give the matrix B.

$$B=\begin{bmatrix}0.142\ 4 & 0.024\ 2 & 0.028\ 9 & 0.032\ 9\\ 0.136\ 1 & 0.064\ 5 & 0.022\ 7 & 0.031\ 4\\ \vdots & \vdots & \vdots & \vdots\\ 0.060\ 1 & 0.064\ 5 & 0.078\ 5 & 0.032\ 2\end{bmatrix} \quad (2)$$

After correcting the calculation, the maximum characteristic root was obtained as $\lambda max=\sum_{i=1}^{n}=\frac{(AW)_i}{w_i}=4.069\ 1$. CI=0.023, CR=0.025 6<0.1, which passed the matrix consistency test.

Through the above data statistics and analysis, and combined with the marketing staff, design workers, and consumers to evaluate the weights of each indicator KANO attribute affiliation. The weights of each evaluation index are shown in Table 4.

Table 4. Affiliation weights of KANO attributes of packaging design

Excellent Packaging Design	Required Attributes	Desired Attributes	Attractive Attributes	Undifferentiated Attributes	Weight
Required Attributes	1	1/2	3	5	0.10626
Desired Attributes	2	1	4	1/3	0.27373
Charismatic Attributes	1/3	1/4	1	2	0.09203
Undifferentiated Attributes	1/5	3	1/2	1	0.04156

The normalized matrix is multiplied with the weight matrix affecting the packaging design to obtain the combined weight matrix. That is

$$U=\begin{bmatrix} 0.142\ 4 & 0.024\ 2 & 0.028\ 9 & 0.032\ 9 \\ 0.136\ 1 & 0.064\ 5 & 0.022\ 7 & 0.031\ 4 \\ \vdots & \vdots & \vdots & \vdots \\ 0.060\ 1 & 0.064\ 5 & 0.078\ 5 & 0.032\ 2 \end{bmatrix} x \begin{bmatrix} 0.105\ 26 \\ 0.272\ 73 \\ 0.093\ 03 \\ 0.042\ 56 \end{bmatrix} \quad (3)$$

The percentage of each influencing factor is multiplied by the weight affecting the packaging design to derive the final weight priority system of the packaging design index (Table.4). Finally, the first five key indicators are appearance color, text recognition, window de-signing, certification label and structure, and the research on the data is in line with the influence of color language visual perception on graphics and text information transmission function. See Table 5.

Table 5. Packaging design index weighting system

Serial number	Packaging design evaluation index	Weights
1	Appearance color	0.0673
2	Text recognition	0.0353
3	Window design	0.0333
4	Certification label	0.0326
5	Structure	0.0281

3.4 Regional agricultural product packaging design strategy based on KANO model

In this study, the packaging design of Suichuan kumquat, a regional public brand of Suichuan County, was designed with the main image of Suichuan kumquat planting terraces as the design element, and contrasting and high purity colors were chosen to highlight the theme (Fig. 3). To meet the needs of different consumers, a variety of packaging structures were used, such as net packaging, ordinary gift boxes, high-end gift boxes, and supermarket supply and bulk packaging to make the entire packaging form uniform. Finally, the vectorized illustration was processed on Adobe Illustrator 2022 computer software, the system color display contains 4 color systems, 326 colors and 76,246 pixel points, after the illustration was completed, it was imported into Adobe Photoshop 2022 for the rendering of the packaging design drawings, and finally the visual effect of the completed packaging was presented, making the whole illustration can stimulate consumers' senses and bring out the tone of the product, see Fig. 3.

Fig. 3. Suichuan kumquat packaging design

4 Strategic significance of "Internet + Design" to help marketing regional agricultural products

The use of the "Internet + design" model connects the countryside and the city as a whole, "providing an alternative path to poverty alleviation and prosperity for the rural revitalization strategy, triggering changes in public policies through Internet technology and design interventions, and achieving the optimization of rural production factors in resource allocation [4]. . The creation of personalized regional brands has become an important grasp for the development of rural revitalization strategy, promoting the transformation of China into a strong agricultural country and a strong brand country, and the transformation from "selling products" to "selling brands", using design to empower the development of special agricultural products out of the mountains to provide more development opportunities and ways of realization. We will use design to empower and bring special agricultural products out of the mountains to provide more opportunities and ways to realize.

5 Conclusion

Through the application of KNAO model for rationalized design and the research and exploration of "Internet+design" model for regional public brands, we have upgraded the packaging of regional agricultural products from brand building to branding. Through the exploration of regional public brand regional culture and brand value, we summarized the methods and sig-

nificance of brand value enhancement of rural agricultural products through brand design practice [5]. Design innovation will also become an extremely important way in the development of rural revitalization strategy. The success of brand creation is to deeply implement the characteristic rural agricultural revitalization development strategy, to promote the whole Suichuan County and even the national poor areas to accelerate the realization of high-quality agricultural development, and to complete the great development strategy goal of achieving poverty eradication and building a well-off society at an early date.

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