What Chinese Female Online Shoppers Need

A Case Study by Applying the Kano Model in E-Commerce

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Abstract. Chinese females always become confused by the "more goods, harder choice" principle when they are shopping online without a definite shopping goal. Taobao wants to provide a high quality shopping guide in its women's market to solve this problem. Before the Taobao women's market is established, we should urgently answer the question of which shopping guide functions should be prioritized most highly? In the past, we solved this problem by using the experience of the web-site operator. However, that the website operator plays a decisive role is a very subjective judgment, and the risk cannot be estimated in advance. The Kano model is good at solving the priority problem of functions. Thus, we selected the Kano model for this study. We evaluated 27 shopping guide functions and used them to prioritize the functions of Chinese female consumers' shopping, which provided an important reference basis for the presentation of a new web page and web page design for the Taobao women's market. A total of 19 shopping guide functions have been realized in the Taobao women's market homepage, and each shopping guide function plays a different role. This study fills in the blanks around how the Kano model may be applied in the field of e-commerce.

Keywords: Kano model, e-commerce, Chinese female consumers, shopping online, no definite shopping goals, shopping guide, Taobao women's market.

1 Introduction

Contemporary e-commerce in China has been increasing at a dramatic rate with the rapid development of the internet. In 2013, China's online shopping market reached 1.85 trillion RMB with 42 percent growth, and online shopping captured 7.8% of the total social retail sales market[1]. At the same time, online shopping has become a hot, daily topic for Chinese female consumers. In the Taobao trade platform, for example, more than forty percent of active sellers' business categories are directly related to Chinese female online shoppers, such as women's clothing and skin care. Both from the perspectives of consumer's and merchants' data, the influence of Chinese women in e-commerce is obvious.

1.1   Shopping Guide Problems Experienced by Chinese Females When Online Shopping

While dealing with a great deal of merchandise supplied by e-commerce websites, consumers with definite shopping goals can use search functions to find their goods satisfactorily. Usually, however, Chinese women do not have definite goals while shopping online. Hence, many e-commerce companies, such as Mogujie and Meilishuo, seize market share by launching a shopping guide service to promote purchases. However, Chinese females are always puzzled by the "more goods, harder choice" principle when they are shopping online. This puzzle has attracted the attention of e-commerce website managers, who have attempted to solve this problem by providing high quality shopping guides. The Taobao company is no exception, and it has sought to improve the shopping guide experience of Chinese female online shoppers by establishing the Taobao women's market.

The so-called e-commerce shopping guide found on websites helps consumers to complete shopping decision-making processes by providing specific functions (including evoking requirements, collecting information, evaluating information and deciding purchases). Website operators first focus on the conundrum that there are so many shopping guide utilities, which should be used first? Thus, before establishing the Taobao women's market, we should preferentially answer the question about how different shopping guide functions should be prioritized.

In the past, we solved this problem by using the experience of the website operator. However, that manner of solving the problem had two disadvantages. First, that the experience of the website operator plays the decisive role requires a subjective judgment. Second, the risk cannot be estimated in advance, be caused to happen or occur as a consequence. To estimate the risk in advance and to generate more stable, accurate data, we introduced a research model in this study.

1.2   Introduction and Selection of the Kano Model

Many function-need assessment models exist; one of the most famous and widely used is the Kano model (Kano, 1984) [4]. The Kano model is good at solving the priority problem of functions. The outcome of the Kano model is stable and reuseable; thus, we chose the Kano model to research shopping guide functions of the Taobao women's market to solve the business problem. This represents the first time that the Kano model has been used in an e-commerce practical application.

Functional Classification of the Kano Model. According to the algorithm of the Kano model, as shown in table 1, the function of the product can be divided into five categories.

Table 1. Evaluation table for classifying quality attributes using the Kano questionnaire (Kano,1984)

Attribute is fulfilled	Attribute is not fulfilled				
	Satisfied	It should be that way	I am indiffe-rent	I can live with it	Dissatisfied
Satisfied	Q	A	A	A	O
It should be that way	R	I	I	I	M
I am indifferent	R	I	I	I	M
I can live with it	R	I	I	I	M
Dissatisfied	R	R	R	R	Q

Notes: M:must-be, O:one-dimensional, A:attractive, I:indifferent, R:reverse,
Q:questionable.

Different categories influence consumer experience to various degrees, and the influences of the qualities in decreasing order is as follows: Must-Be, One-Dimensional, Attractive, Indifferent and Reverse.

According to the one-dimensional quality theory, in situations where an attribute is fulfilled, the customer will tend to feel satisfied. However, when the impact on satisfaction is not proportional, the fulfillment of this attribute will not increase customer satisfaction; instead, non-fulfillment of it will result in dissatisfaction. This represents the Must-Be quality. In situations in which an attribute is not fulfilled, the customer will tend to feel dissatisfied; however, if the impact on dissatisfaction is not proportional, the non-fulfillment of this attribute will not increase customer dissatisfaction. In other words, it will lead to customer satisfaction when fulfilled, but it will not result in customer dissatisfaction when not fulfilled. This is the Attractive quality. In situations in which the quality element results in neither satisfaction nor dissatisfaction, whether fulfilled or not, we have the Indifferent quality. In situations in which the quality element results in dissatisfaction when fulfilled and in satisfaction when not fulfilled, we have the Reverse quality. Fig. 1 illustrates the concept of the non-linear relationship of performance and satisfaction in Kano's two-dimensional quality model. Because the Reverse quality does not represent a legitimate customer need in real world practice, this study focuses on a discussion of the first four qualities: Must-Be, One-Dimensional, Attractive and Indifferent.

The Kano Model's Better–Worse Coefficient Analysis and Functional Sequences.
Based on the percentage of the categorizations of functional requirements, and according to the calculation formula of the Kano model's quality, as proposed by Berger (1993) [5], we can obtain the Kano model's Better–Worse coefficient. Better coefficients can be interpreted as satisfaction coefficients; after increases in functions, user satisfaction will rise; the larger the positive value, the more user satisfaction will rise and the more quickly it will rise. The Worse coefficient can be conceptualized as a dissatisfaction coefficient; it shows that, if there is no function or the function is
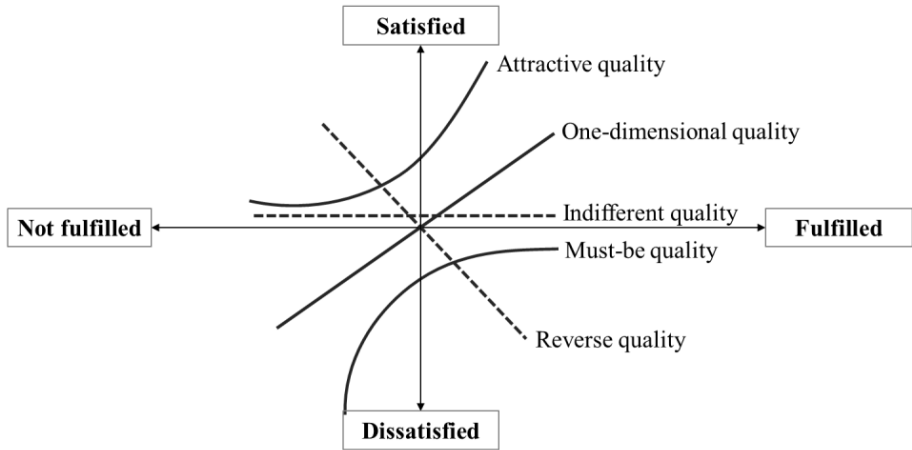
Fig. 1. Kano's two-dimensional quality model (Berger et al., 1993)

eliminated, user satisfaction decreases; the more negative the value, the more user satisfaction declines and the faster it declines. We can combine these two coefficients to obtain the functional sequences. The higher the Better coefficient value, the higher the priority the function has. With the Better coefficient value holding steady, functional sequences increase the worse coefficient value, and the lower Worse coefficient value, the lower priority [5] .

2   Method

2.1   The Questionnaire Design

Function Selection of the Shopping Guide. We used competitive products analysis to determine which functions of shopping guides should be selected. First, considering the status quo of Chinese female online shopping, we chose 19 typical e-commerce websites of four types on which to perform a competitive products analysis, such as Tmall, JD of B2C type, and Mogujie, Meilishuo of Advisory shopping guide website type etc. These selections are shown in Table 2.

Table 2. Names and classification of e-commerce websites of four types

Classification	Detailed names of websites
B2C	Tmall、 JD、 Amazon、 Dangdang、 Jumei、 Vip、 Moonbasa、 Glamouar、 Suning、 Yintai
C2C	TaoBao、 Ymatou、 Paipai
Brand's official website	Uniqlo、 Only
Advisory shopping guide website	Mogujie、 Meilishuo、 Guang、 Xiangqu

Second, we extracted and defined the guide function of the competing products' websites (the non-involvement of the search function, the details shown with merchandise, online payment and other aspects of functional analysis). Considering the similarities and differences between the functions, we extracted 72 specific functions. At the same time, all of the functions were redefined to ensure that each function could be accurately recognized by Chinese women. This extraction produced a challenge insofar as 72 functions far exceeded what has been considered in previous studies investigating the Kano model; meanwhile, we could not obtain valid data.

To solve this problem, we used expert assessment to select the most valuable features of those functions, including two user research experts and two website operator experts. Each expert was weighted equally. The assessment dimensions included the following: 1) the degree of coincidence between shopping guide functions and the Taobao women's market orientation and 2) how the shopping guide function might contribute to the market value. The assessment scores ranged from 1 to 5, with higher scores indicating more qualified representations to the target market and higher contributions to the market value. Ultimately, 27 shopping guide functions' score exceeded 6 points; these were selected to be investigated in the questionnaire. These findings are summarized in Table 3.

Table 3. 27 shopping guide functions and their scores by competitive products analysis

Function	Score	Function	Score
Age guide	7（4，3）	Location guide	6（3，3）
Appearance classification	8（4，4）	Material classification	10（5，5）
Body type guide	8（5，3）	My wardrobe	8（4，4）
Color classification	8（4，4）	My XX home page	6（3，3）
Commodity categories	10（5，5）	New arrivals guide	8（4，4）
Commodity using effects classification	7（3，4）	Public praise recommendation	10（5，5）
Common people try on/trial	10（5，5）	Purpose-specific guide	6（3，3）
Experienced shopper's recommendation	10（5，5）	Seasons classification	6（3，3）
Fashion trends section	8（4，4）	Size assistant tool	10（5，5）
Features recommendation	10（5，5）	Size classification	10（5，5）
Festivals guide	7（4，3）	Style classification	9（5，4）
Friends share/recommendation	8（5，3）	Using occasion guide	9（4，5）
Incentive rebates recommendation	6（3，3）	Workmanship classification	7（4，3）
Match function	10（5，5）		

The Questionnaire Content. The questionnaire included three aspects: 1) the basic consumer shopping situation (e.g., the Taobao Shopping common mode/frequency/scene); 2) the shopping guide functions (in accordance with the requirements of the Kano questionnaire, users were asked to evaluate how well the site provided this function on a 1 to 5 scale, with options of "Satisfied," "It should be that way," "I am indifferent," "I can live with it," and "Dissatisfied"; and 3) the consumers' basic information (e.g., gender, age, education).

2.2 Questionnaire Administration

From 9:30 on August 26, 2013 to approximately 9:30 on August 27, 2013, we placed the questionnaire on the Taobao homepage, and consumers were invited to click the link to respond to the questionnaire.

2.3 Data Recycling

After 24 hours of data collection, we had collected 26,912 raw data entries. After rigorous data cleaning, we obtained 14,483 valid responses from Chinese women consumers.

2.4 Data Analysis

Functional Requirements Classification. On the basis of this large set of valid data, we classified the functions of a shopping guide according to a data analysis of the Kano model.

Through confirmed functional requirements classification following the Kano model, we proposed a new analysis algorithm.

Upon initiating the research using the Kano model, researchers identify the quality that the largest number of respondents selected as the classification of one function. To classify the results more accurately, some researchers introduce the chi-square test and choose the larger of two quality dimensions for significance testing. If the difference is not significant, according to the M>O>A>I priority order, the quality of the function is classified. If the difference is significant, it is ensured that the sum of the largest proportion of quality as the functional requirements classification.

However, we found that the chi-square test results were affected by the sample size. First, if the sample size was too little, it would have a large error and the results would need to undergo further calculation correction. Second, if the sample size was large enough, the results would be significantly different in theory and would lead to selection of the quality with the largest number of people as the final functional requirements classification.

Focusing on the above problems, we used the sample proportion test(reflecting a condition of small sample size) and the quality convergence figure (a Matlab program that we wrote for a situation representing a largeenough sample size) methods to determine the combined function requirements classification, which successfully reduced the influence of the sample size on the result.

Function Priority Order. First, we assessed according to the functional classification of M>O>A>I priority. For the same classified internal function, we synthesized Better-Worse coefficients and then sorted further. Finally, we obtained the prioritization of all of the functional requirements.

Table 4. Kano model's results

Functional classification	Order	Shopping Guide Function	Better coefficient	Worse coefficient
One-Dimensional quality(10)	1	Common people try on/trial	0.8012	-0.5578
	2	Public praise recommendation	0.7437	-0.4669
	3	Size assistant tool	0.7007	-0.4286
	4	Commodity using effects classification	0.6774	-0.4376
	5	Appearance classification	0.6772	-0.4676
	6	Material classification	0.6681	-0.4524
	7	Seasons classification	0.6650	-0.5206
	8	Size classification	0.6636	-0.5525
	9	Color classification	0.6108	-0.4168
	10	Commodity categories	0.5849	-0.5002
Attractive quality(12)	1	Match function	0.7260	-0.3006
	2	My wardrobe	0.7052	-0.3427
	3	New arrivals guide	0.7036	-0.3339
	4	Style classification	0.6724	-0.3671
	5	Incentive rebates recommendation	0.6573	-0.2890
	6	Using occasion guide	0.6549	-0.3473
	7	Body type guide	0.6471	-0.2867
	8	Festivals guide	0.6388	-0.3122
	9	Purpose-specific guide	0.6376	-0.3030
	10	Features recommendation	0.6278	-0.2683
	11	Fashion trends section	0.6236	-0.3421
	12	Age guide	0.6164	-0.3372
Indifferent quality(5)	1	Experienced shopper's recommendations	0.5317	-0.1735
	2	Location guide	0.5250	-0.2358
	3	Workmanship classification	0.5136	-0.2594
	4	Friends share/recommendation	0.4723	-0.1509
	5	My XX home page	0.4718	-0.1941

3   The Kano Model's Results

The functions' priorities in the Taobao women's market are shown in table 4. From the 27 functions of the shopping guide, 10 functions belonged to the One-Dimensional quality. These functions had the most impact on women's market experiences. If these functions were provided, satisfaction was found to directly improve; if not, satisfaction was found to decrease, and it would be suggested to implement these functions. Furthermore, according to sorting the Better–Worse coefficients, 3 of the 10 One-Dimensional quality functions that fell into the former category were "Common people try on/trial," "Public praise recommendation," and the "Size assistant tool."

12 reflected the Attractive quality: if these functions were provided, it enhanced user satisfaction; if not, it did not affect the user's experience. These functions act as "surprise" functions provided to consumers, and they might be selected according to the actual situation of a business.

5 belonged to the Indifference quality and had no direct effects on customer satisfaction. These might be weighed according to the actual situation of a business.

4   The Application of the Kano Model's Results

In addition to the user researchers, web site operators, product managers, designers, and engineers all participate in the Taobao women's market. The manner in which specific functions on the page are applied is shown in figure 2.
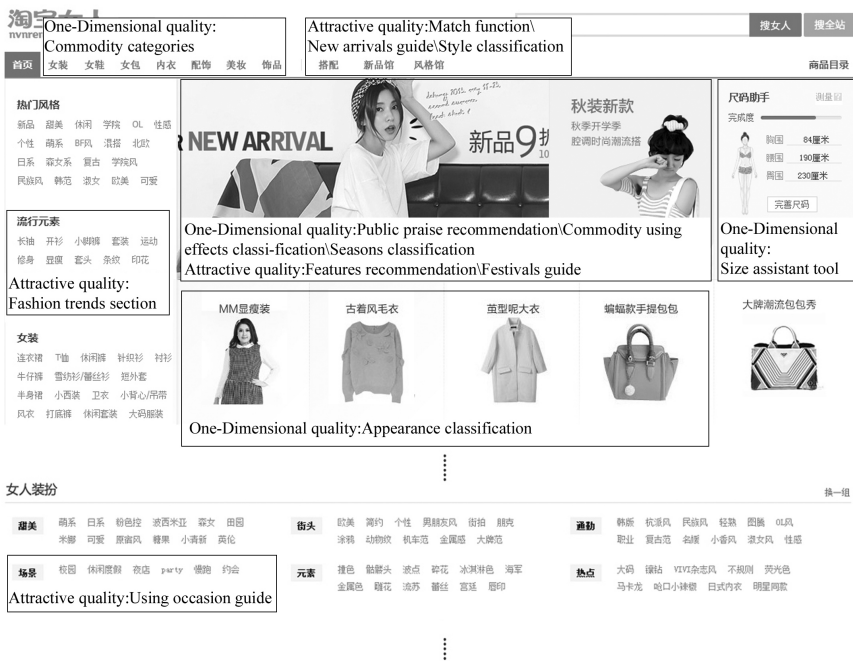

Fig. 2. The realization of shopping guide functions on the Taobao women's market homepage

4.1   The Realization of Shopping Guide Functions' One-Dimensional Quality: 6 on the Taobao Women's Market Homepage and 4 through Relevant Pages

10 shopping guide functions reflecting One-Dimensional quality have been applied on the Taobao women's market to ensure the most fundamental experiences on the page. The "Public praise recommendations", "Size assistant tool", "Commodity using effects classification", "Appearance classification", "Seasons classification" and "Commodity categories" have substantial influences on demand in the early stages of the consumer arousal and are reflected on the homepage of the Taobao women's market. Material, color and size are inherent attributes of commodity, as is the dimension "Common people try on/trial" which consumers think about at a later stage in the shopping guide decision-making process. This reflects the continuous operation of consumers, which is continued through secondary and other pages of the market.

4.2   The Realization of the Shopping Guide Functions' Attractive Quality: 7 on the Taobao Women's Market Homepage

To guide consumers' shopping and to create a characteristic of the Taobao women's market, the market focuses on attractive quality shopping guide functions. There are 7 attractive qualities shown in the Taobao women's market homepage: "Match function", "New arrivals guide", "Style classification", "Using occasion guide", "Festivals guide", "Features recommendation" and "Fashion trends section". As the influence of match on Chinese females increases, "Match function" gradually will become one of the core functions of the Taobao women's market.

4.3   The Realization of the Shopping Guide Functions' Indifference Quality: 2 on the Taobao Women's Market Homepage

The Taobao women's market does not abandon the shopping guide functions' indifference quality. Consumers can see abundant Social Network Site (SNS) information and news to explore SNS's value in the Taobao women's market. Now, "Experienced shopper's recommendation" and "My XX homepage", which reflect the indifference quality, have been realized in the Taobao women's market. Discussion

The applications of this research show that the Kano model can solve the problem of function priority in e-commerce. It can also be applied at present to a new web page and web page design. The results of the Kano model are available in and applicable to the field of e-commerce. In addition to the content presented in the application, the Kano model has further room for development in the field of e-commerce.

4.4   The Extended Application of Research Results

The Results of the Kano Model Help Improve Drainage Efficiency. E-commerce websites often have difficulty in introducing new UV. Through the Kano model, we can obtain the largest function point that affects customer satisfaction. Furthermore,

we can focus on these functions to improve drainage efficiency. In Kano model research, larger Better coefficients indicate that user satisfaction can be more greatly promoted. Through the use of the Better coefficient to order functions, we can obtain functions that have the largest influences on consumer satisfaction. For example, when the Taobao women's market, as shown in table 4, is in the process of introducing new UV, it can pay more attention to the "Common people try on/trial", "Public praise recommendation", "Match function", "My wardrobe" and "New arrivals guide."

The Results of the Kano Model Help Realize Personalized Service. In this research, nearly 70% Chinese female customers under 26 years of age regard the Age guide as having an attractive quality; in contrast, nearly 30% Chinese female customers above 27 years old regard the Age guide as having an indifferent quality. Female customers grow with different needs at different stage, so the Taobao women's market should consider personalized services combining user characteristics. To make a bold prediction, we suggest further consideration be based on this study's findings to form specific products' direct applications on corresponding pages and to match customers' needs based on data we obtain to provide the fittest content, thereby boosting the ability to meet the "varied people, varied content"(Precise personalized recommendations and accurate information display) principle.

4.5   The Breakthrough of Study Method of the Kano Model in E-Commerce

In this research, we confronted challenges resulting from particular aspects of e-commerce and then endeavored to make breakthroughs in the following areas.

First, due to our identifying too many shopping guide functions when we first chose function points, valid data could not be collected. We resolved this problem by leveraging expert evaluations, resulting in the identification of the most valuable 27 out of the original 72 function points.

Second, due to a defect of the chi-square test when classifying function points, we combined the sample proportion test and the quality convergence figure (a Matlab program written by ourselves) to confirm the classification of function points, thereby reducing the impact of sample size on results.

Beyond the breakthroughs we have already made, we will conduct more studies to explore the impact of function numbers and customers' experiences, optimizing the Kano model study method's application on the area of e-commerce.

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