

Research on the Differences between Different Service Objects in the Perception of E-Commerce Service Quality

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Abstract. In e-commerce environment, service objects' perception of e-commerce service quality has become one of the important indicators to evaluate the development of e-commerce. In this paper, by choosing some senior high school students and college students as research objects and taking their shopping experience on Taobao.com as example, the differences of different service objects in perceived e-commerce service quality are analyzed, and finally it is concluded that different service objects have different requirements and perception of e-commerce service quality.

Keywords: Service Objects, E-commerce, Service Quality, Perceived Differences

1. Introduction

With the accelerated development of the Internet and the popularization of web technology, the development speed of e-commerce stores has been extremely fast so that countless new e-commerce websites are born every day. With too many e-commerce websites, customers can make a choice only by the instant clicks of mouse. If the demand of customers is not fulfilled by merchants in network channels, the sources of customers will be less when competitors step into the market in succession. In such a shopping process, customers' perception of e-commerce website service quality as well as its importance has become apparent gradually. Therefore, the perception of e-commerce website service

quality has changed into an important subject in the field of e-commerce research (Parasuraman et al. , 2005)).

In this paper, by choosing some senior high school students and college students as the main service objects in the sales mode of e-commerce environment and based on the numerical attributes reduction of neighborhood granulation and roughness approximation, an attributes scale about customers' perception of service quality is established (Parasuraman2005), and then the tendency characteristics of different service objects in choosing perceived service quality attributes are compared and also their results in service quality evaluation are obtained and analyzed with analytical hierarchy process (AHP) and fuzzy comprehensive evaluation (Jiang, 2009), so as to lay a certain foundation for the research on the differences between different service objects in the perception of e-commerce service quality.

2. The Establishment of the Evaluation Indexes for the Perception of E-commerce Service Quality

By referring to the academic research results of many years, seven e-commerce service quality dimensions (easy-to-use, practicality, reliability, responsiveness, interactivity, empathy, and entertaining) are identified in this research (Yoo and Donthu, 2001). After survey study is applied and seven dimensions are used as the starting points, 28 questions are designed as the original scale for the service quality evaluation of this research; with Likert five-point scale, the importance of each factor and the satisfaction on all current services are measured with the actual perception by customers. Before the formal questionnaire is used, an online questionnaire as pretest is released in this research so as to improve the questions and suggestions proposed in the testing process and determine the items, and then a field visit investigation is implemented.

3. Analysis on the Differences in the Perception of E-commerce Service Quality

The research objects chosen in this paper are some senior high school students and college students with shopping experience on Taobao.com. 167 college students effectively accessed to the questionnaire link and correctly filled the questionnaire, and 113 senior high school students effectively filled the questionnaire.

3.1 Reliability and Validity Tests

According to the researches of scholars, high reliability is expressed with Cronbach's Alpha>0.7. In this research, Cronbach's Alpha coefficient of the original questionnaire for college students is 0.798 and that for senior high school students is 0.744, suggesting the questionnaire is of higher reliability.

An evaluation index system is established, and then evaluation index weights are determined based on AHP and then overall e-commerce service quality is evaluated with fuzzy comprehensive evaluation. The system is proven to be of feasibility after analysis and comparison.

3.2 Data Analysis Methods

With the combination of AHP with Fuzzy, not only the non-objective evaluation caused by the fuzziness of indexes can be processed well, and also the weight distribution difficulties caused by too many indexes can be prevented (Jiang, 2009).

3.3 Solving and Determining the Evaluation Index System by Model

Evaluation index attribute reduction is implemented as follows. First, $NDT1=\langle U1,A1,D1 \rangle$ is established: the data of 167 college students is used as the set ($U1$) of discourse domain; the set of evaluation dimension attributes is the set ($A1$) of condition attributes; decision attribute item ($D1$) is composed by the mean of the importance of all $U1i$ ($i = 1, 2, \dots, 167$) evaluation indexes. Then, $NDT2=\langle U2,A2,D2 \rangle$ is established: the data of 113 senior high school students is used as the set ($U2$) of discourse domain; the set of evaluation dimension attributes is the set ($A2$) of condition attributes; decision attribute item ($D2$) is composed by the mean of the importance of all $U2i$ ($i = 1, 2, \dots, 113$) evaluation indexes. $\delta=0.125$ is set, namely the diameter of the neighborhood is equal to 0.125; 0.8 is set as the value of variable precision π . In Matlab2009b environment, the forward greedy numerical attributes reduction is solved through programming, so evaluation index attributes are solved and also evaluation dimensions are re-captured.

3.4 Determining Index Weight

Firstly, determining the weights of all indexes of the secondary index system. The primary indexes of college students include easy-to-use ($A11$), practicality ($A12$), interactivity ($A13$), responsiveness ($A14$), empathy ($A15$), and entertainment ($A16$); the primary indexes of senior high school students include easy-to-use ($A21$), practicality ($A22$), responsiveness ($A23$), empathy ($A24$), and entertaining ($A25$). According to the importance gradient obtained from the attribute reduction of the above survey data results, a scale 1~9 is used again for giving a value to the importance of all indexes:

$$A1=[A11,A12,A13,A14,A15,A16]=[7,9,5,5,3,1]$$

$$A2=[A21,A22,A23,A24,A25]=[3,7,5,9,1]$$

Secondly, establishing the set of comments. In questionnaire survey, the membership (VK) of each secondary index of Taobao.com service quality

perceived by interviewees to the k th level is analyzed with 5 Likert standards, and the discourse domain of comment levels is $V=\{V_1, V_2, V_3, V_4, V_5\}=\{1, 2, 3, 4, 5\}=\{\text{very dissatisfied, dissatisfied, general, satisfied, and very satisfied}\}$. Indexes are directly scored by the interviewees evaluating the service quality. The value of V_{ij} is the quotient through dividing the number of the interviewees (thinking factor A_{ij} is at the k th level) by the total number of interviewees. Then, the set of level weights is $A_{ij}=(V_{ij1}, V_{ij2}, \dots, V_{ij5})$. V_{ijk} has been normalized.

3.5 Solving by Fuzzy Comprehensive Evaluation

Firstly, primary Fuzzy Comprehensive Evaluation. Single fuzzy evaluation is $B=A*R=\{b_1, b_2, \dots, b_n\}$, in which R is a comprehensive evaluation matrix as follows (Lv, 2012).

$$R = \begin{pmatrix} R_1 \\ M \\ R_n \end{pmatrix} = \begin{pmatrix} r_{11} & L & r_{1m} \\ M & O & M \\ r_{n1} & L & R_{nm} \end{pmatrix} R = \begin{pmatrix} R_1 \\ M \\ R_n \end{pmatrix} = \begin{pmatrix} r_{11} & L & r_{1m} \\ M & O & M \\ r_{n1} & L & R_{nm} \end{pmatrix}$$

Where, $R=(r_{ij})n*m$ and $r_{ij} \in [0,1]$ are established; n is the number of evaluation indexes. A is the weight set of evaluation indexes: $A=(a_1, a_2, \dots, a_n)$ $\sum a_i=1$. Thus, $b_j=\sum a_i*r_{ij}$ ($j=1 \dots m$) is established. Here, b_j is the function of r_{ij} , namely evaluation function.

Secondly, Secondary Fuzzy Comprehensive Evaluation.

$$B = A * R = A * \begin{pmatrix} B_1 \\ M \\ B_n \end{pmatrix} = \begin{pmatrix} A_1 & * & B_1 \\ M & * & M \\ A_n & * & B_n \end{pmatrix}$$

Where, n is the number of primary evaluation indexes; $A=[A_1, A_2, \dots, A_n]$ is the weight vector of primary evaluation indexes. After calculation, B is the quantitative value of each gradient membership.

Thirdly, solving by Fuzzy Comprehensive Evaluation. Based on the above principle, five secondary comprehensive evaluation matrixes are established according to the membership of the comments set, and then each weight solved with AHP are used for multiplying the corresponding secondary comprehensive evaluation matrix. Thus, the result of the primary fuzzy comprehensive evaluation is obtained (Zhang and Li, 2006).

Therefore, the product of the primary indexes weights W_1, W_2 and the primary fuzzy comprehensive evaluation matrix R_1, R_2 is the result of the primary fuzzy comprehensive evaluation: $B_1 = W_1 * R_1 = [0.0539, 0.1980, 0.3642, 0.3640, 0.0211]$; $B_2 = W_2 * R_2 = [0.0190, 0.1911, 0.3602, 0.3783, 0.0712]$.

Lastly, evaluation results. In this questionnaire survey, five Likert standards are used as the comments set scores corresponding to the choice questions of matrix: [very dissatisfied, dissatisfied, general, satisfied, and very satisfied] = [1,

2, 3, 4, 5]. According to the above stipulated rating scores, the evaluation result of college students E1 and senior high school students E2 on perceiving Taobao.com service quality is as follows:

$$E_1 = B_1 * V^T = B_1 * (1,2,3,4,5)^T = 3.1040.$$

$$E_2 = B_2 * V^T = B_2 * (1,2,3,4,5)^T = 3.3510.$$

4. Conclusion

From the overall result, it is seen that the evaluation of college students on Taobao.com service quality is different from that of senior high school students, suggesting the requirements of college students on online shopping service quality are higher. The selection of service quality attributes can reflect that college students pay particular attention to the timeliness of service quality, while senior high school students are more likely to feel satisfied with the current service quality compared with college students. However, more specific reasons for this result remain to be further researched in details..

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