Consumer Online Shopping Satisfaction Evaluation Research

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Abstract: *The innovation of Internet technology and the popularity of mobile network make online shopping gradually develop into a new sales model. In the increasingly fierce market competition, in order to perceive the needs of consumers online shopping, timely analysis of the key factors affecting consumer online shopping satisfaction, and construct the evaluation model of consumer satisfaction index system (4 first-level indicators, 7 second-level indicators and 17 tertiary indicators) by using fuzzy comprehensive evaluation method. Through the model Through the model can see that all kinds of products and 24-hour shopping services are the most important factors for consumers, on this basis, put forward measures and suggestions to improve consumer satisfaction.*

Keywords: *Consumer, Online Shopping, Satisfaction Evaluation, Countermeasure Analysis*

1. Introduction

Nowadays, with the rapid development of the Internet, e-commerce is more and more accepted by the masses, and people's working style and living conditions have also changed dramatically. Online shopping has become an important way for people to spend, so it has also produced valuable business data (Jing, 2021). Alibaba, JD.com and other representative large companies through various channels for the collection and processing of big data analysis; however, due to the data structure of big data is too complex and diverse, and some data privacy issues. Therefore, it is necessary to use data model to analyze consumer's online shopping satisfaction.

The use of big data mining technology for product positioning has become an unstoppable trend. Most researches use the online consumer experience as an entry point to analyze the incongruity of payments after online shopping (i.e., the incongruity that occurs between online payments and product receipts). The former helps reduce post-online payment misalignments and enables consumers to experience higher satisfaction, higher willingness to buy back, and lower complaints than they do to provide an online experience (Chen and Gao, 2020). This research investigates factors that may affect customer satisfaction with online shopping, and establishes a theoretical framework to explain the causal relationship between perceived benefits, perceived risks, online shopping trust, and customer satisfaction. Correlation and regression analysis of 402 respondents with online shopping experience in China showed that perceived benefits (i.e., shopping convenience, product selection and enjoyment), product risk and online shopping trust were important predictors of customer satisfaction.

This paper distributes questionnaires to netizens with online shopping experience, and extracts valid information from empirical data through quantitative analysis of the collected sample data, such as the validity analysis of questionnaires, model testing, etc. Investigate and analyze the impact of various indicators on customer satisfaction, identify customer needs, according to the combination of theory and practice, for e-commerce enterprises to identify and improve the network marketing model, so as to enhance the competitiveness of the enterprise market (Liang, 2015).

2. Consumer Online Shopping Satisfaction Evaluation System Inquiry

2.1 Consumer Online Shopping Satisfaction Data Mining Process

2.1.1. The Main Stages of Data Mining

The data is prepared to choose the appropriate data set based on what we need to accomplish and what we want to achieve.

After the data crawl acquisition is required for pre-processing of data, it is necessary to pre-process the data, such as removing duplicate data, empty values, special symbols, incomplete data and so on. The main purpose of pre-processing is to improve the quality of data, including data cleansing, integration, regulation and conversion to structured data.

After processing in the previous step, the data is transformed into the desired characteristics. Such characteristics require accurate and effective elaboration of the data. The appropriate features can greatly improve the effect of mining, and at the same time help the next step of data model improvement. A model supported by existing data is established, and the most suitable model for this experiment is selected according to the characteristics of the data set.

A model supported by existing data is established, and the most suitable model for this experiment is selected according to the characteristics of the data set. When you don't know which model is suitable for your experiment, you can use the existing model to mine the data until the selected model result error is within the expected range. Once the model is selected, the parameters in the model need to be adjusted appropriately, and although the existing model can adapt to the dataset of this experiment, it can adjust the parameters to make the model in optimal condition.

After the results analysis and improvement of the model, the model can be used to evaluate and improve optimization (Zhanng and Yan, 2004).

2.2 Measures of Consumer Satisfaction

2.2.1. Multi-level Fuzzy Comprehensive Evaluation Method

Fuzzy comprehensive evaluation method adopts the theory and technique of fuzzy mathematics to make fuzzy comprehensive evaluation of the evaluation object affected by many factors, so as to obtain the method of evaluation result, which has the characteristics of clear results and strong system, can solve the problem of fuzziness and difficult to quantify well, and is suitable for solving the problem that various objects can not accurately determine the index value. It mainly determines the weight of evaluation index by determining a set of evaluation index sets, evaluation scale and hierarchical analysis method, and then uses questionnaires to determine the evaluation factors (Gu and et al., 2016).

2.2.2. Determination of Consumer Satisfaction Indicators

In this study, according to the index system of online shopping and combined with the characteristics of online group purchase itself, the satisfaction index of online shopping consumers can be divided into the following 4 parts.

The first is the website function index, including the renewal speed of the products/services of the group purchase website, the design of website navigation, the function of website classification retrieval, the speed of website access, the diversity and convenience of payment methods.

The second is security index, including the privacy of online shopping security and online shopping online payment security.

The third is the business index, including the product products of online shopping products category richness, price, degree of preference, product service provider home information authenticity and detail, product and service information description of the authenticity and detail, product quality and practicality.

The fourth is the service index, including the response to customer inquiries, product service providers home customer service (e.g., product consulting, ordering, booking), after-sales service quality (such as logistics tracking, return processing, etc.).

According to the characteristics of online shopping and the four aspects of online shopping evaluation, the four factors of the hypothesis model of online shopping are website function index, security index, business index and service index (Li and Hu, 2015).

3. Survey and Research on Consumer Online Shopping Satisfaction Evaluation System

3.1 Research Methods

In this paper, the online questionnaire method is used. The first is to understand the basic information of the interviewees, the second is to determine the weight of consumer satisfaction

indicators, and the third is the survey questions of consumer satisfaction. Each of these questions corresponds to a third-level indicator of consumer satisfaction.

3.2 Data Collection

According to the purpose of the survey, the respondents of the survey selected consumers who had shopped at Tmall Mall. Tmall Mall is the largest market share of B2C shopping sites, choose Tmall Mall as the target mall has a certain representative. A total of nearly 200 questionnaire results were recovered, excluding incomplete and unfiled non-conforming questionnaires, with 179 valid questionnaires.

3.3 Data Processing and Analysis

Applying the data of questionnaire statistics to the specific process of fuzzy comprehensive evaluation method introduced in the previous part, the final evaluation results can be calculated, the specific steps are as follows.

Calculating the second-level index membership matrix, according to the statistical results of the data, it can know that the third-level indicators X11, X12, X13 corresponding to the online store image X1 evaluation rating V of the degree of membership as shown in Formula 1.

$$R_t = \begin{bmatrix} 0.016 & 0.008 & 0.097 & 0.333 & 0.546 \\ 0.016 & 0.023 & 0.473 & 0.364 & 0.546 \\ 0.016 & 0.085 & 0.434 & 0.326 & 0.139 \end{bmatrix} \tag{1}$$

Among them, the judgment matrix is represented by Rt.

The specific calculation of the parameter weighted average method is as follows, in judging vector B (B1, B2, Bj,... Bn) gives each rating the parameter value C1, C2 ,... Ck, with a high to low rating and equal spacing (see the Formula 2).

$$C = \frac{\sum_{j=1}^{n} b_j^t c_k}{\sum_{j=1}^{n} b_j^t} \tag{2}$$

Where t is the pending coefficient. Depending on the circumstances, it is generally desirable to have 1,2.

4. Survey and Research Analysis of Consumer Online Shopping Satisfaction Evaluation System

4.1 Evaluation of Second-level Indicators of Consumer's Online Shopping Satisfaction

This survey of consumer online shopping satisfaction between the general to satisfaction, but biased towards satisfaction, which can show that consumers online shopping satisfaction overall presents a state of satisfaction. However, from the intermediate data results can still see some weak links and urgent problems to be solved. The results of the fuzzy evaluation of the second and third-level indicators are quantified by the method of taking values in the formula of the weighted average method of parameters.

From the evaluation of 7 secondary indicators, the evaluation value of the indicators from high to low is convenience (4.55), security value (4.04), online store image (3.91), customer expectations (3.74), quality of service (3.58), product value (3.36), information value (3.12). Of these, two indicators exceed 4 and the other five are between 4 and 3, all of which are greater than 3.1 (see the Figure 1).
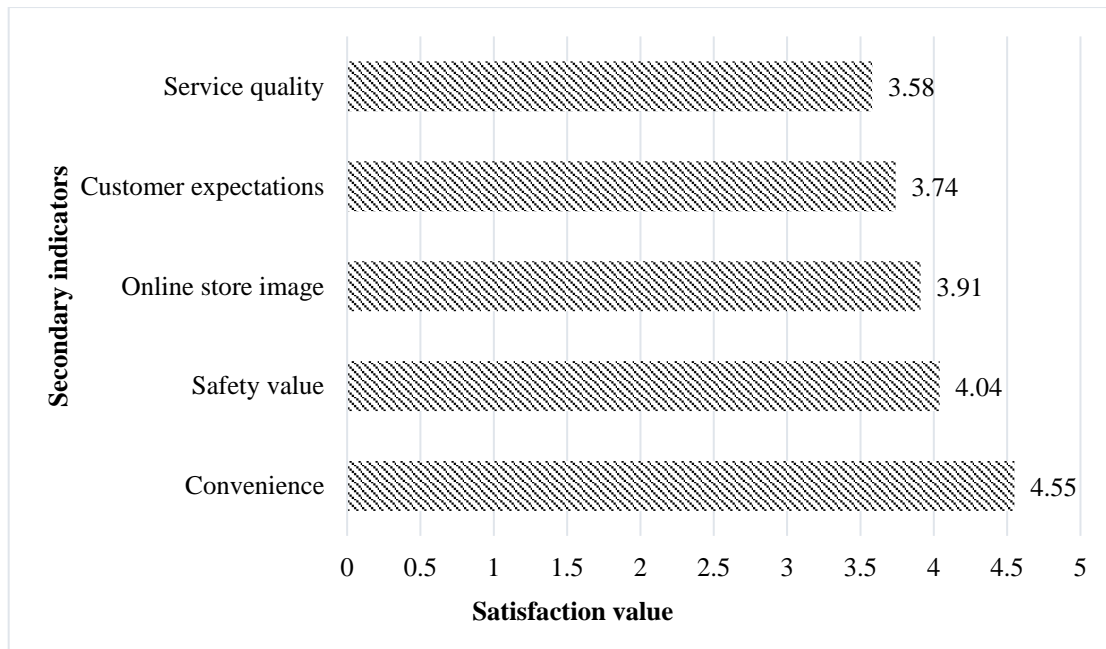
Figure 1: Evaluation of secondary indicators of consumer online shopping satisfaction based on data-driven networks.

From the above data can be seen, the convenience index evaluation is the highest, close to 5, indicating that online shopping with its convenience this advantage has become the first choice of consumers online shopping, to adapt to the modern people's fast-paced living and working state. It is also this unique feature; the development of online shopping has also led to the prosperity of the logistics industry. Information value index evaluation is the lowest, mainly because consumers on the description of online goods information is not accurate enough or people's understanding of the view of deviation, indicating that the shopping process instability still exists.

4.2 Evaluation of Third-level Indicators of Consumer's Online Shopping Satisfaction

For the 17 tertiary indicators, satisfaction between the general to the satisfaction of consumers accounted for the majority, satisfied and very dissatisfied with the minority (see Table 1). As shown in Figure 2, indicators with a satisfaction value of 4.5 points or more are product type, commodity price, 24-hour service, and perceived convenience of web design. Among them, the satisfaction value of product category and 24-hour shopping service is greater than 4.5, the satisfaction value of the remaining indicators is between 3.0-4.5 points, in descending order of the cost of logistics and distribution (4.11), points and discounts (4.06), after-sales communication channels (4.05), logistics distribution mode (3.93), product quality (3.82), online customer service level (3.52), product description (3.35), perceived security of online payment (3.09), timeliness of complaint and return processing (3.08), attitude towards handling complaints and returns (3.05) , customer service attitude and response speed (3.02), logistics and distribution speed (3.01), personal privacy protection (3.00).

Table 1: Data-driven network consumer satisfaction with online shopping three-level indicators.

| Secondary indicators	Three-level indicators	Satisfaction value
Perceived quality	Product Category	4.6
	Product quality	3.82
Perceived convenience	Provide 24-hour service	4.65
	Web Design	4.51
Logistics	Logistics and distribution costs	4.11
	Logistics distribution method	3.93
After-sales service	After-sales communication channels	4.05
	Attitude to handle complaints and returns	3.00
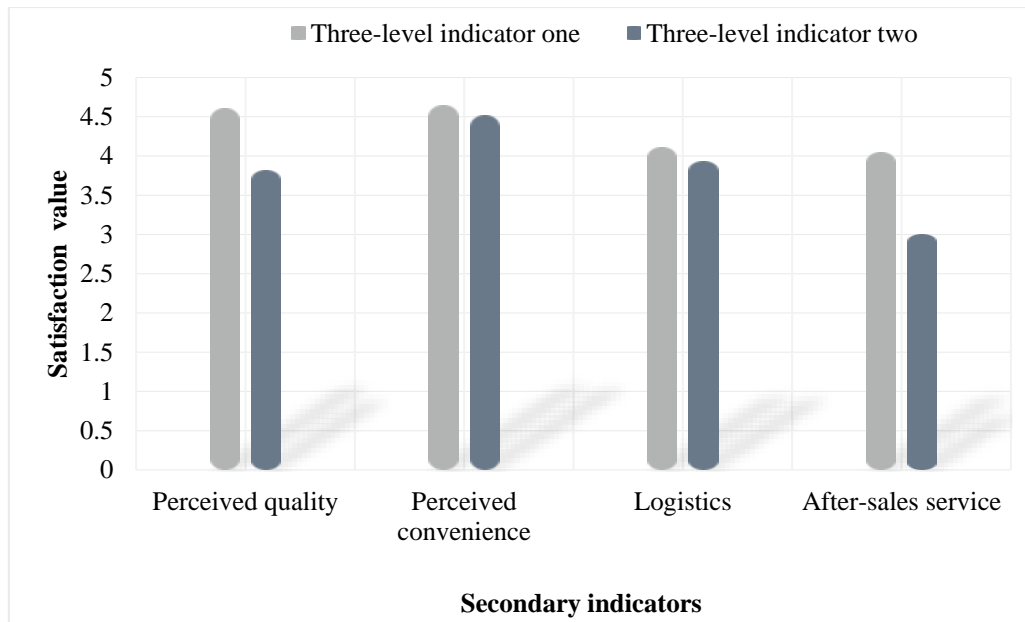
Figure 2: Data-driven network consumer satisfaction with the three-level online shopping index.

The lowest satisfaction score is for personal privacy protection within perceived security metrics. Online shopping requires the registration of a range of personal information, including detailed address, telephone, name and identity information, which can have adverse consequences if used by outlaws. So many online shoppers are reluctant to disclose their true information in case of phone and online scams. In addition, some online consumers on the site to buy some private supplies do not want to let others know, these are personal privacy. Consumers are most dissatisfied with the privacy protection of Tmall's website, so they should strengthen our work in this area in the future. In second place is the speed of logistics and distribution, and the last indicator of personal privacy protection difference of only 0.05 points.

5. Conclusion

With the rapid development of the Internet, e-commerce has also entered the fast track of development. The results of this paper show that the main factors influencing consumers' online shopping satisfaction include perceived quality, perceived price and perceived convenience, which are the inevitable important links of online shopping, and the three aspects that e-commerce enterprises should focus on in the future (Jiang, 2016).

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