

## A Components Model Of Customer Value On E-Commerce

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**Abstract.** Our paper studies customer value of e-commerce based on grounded theory. The customer value model of e-commerce is built up through analyzing the relationship of categorizations and conceptions selected by grounded theory. After that, the evaluation value model is built up by proposing three measurements: the measurement of components, the measurement of relationship and the measurement of influential factors. Finally, we calculate the data from taobao.com utilizing fuzzy comprehensive evaluation method as an empirical research.

**Keywords:** customer value, grounded theory, multi-layer fuzzy comprehensive evaluation

### 1. Introduction

During recent several decades, the booming development in Internet accompanies the rapid development in E-commerce. Since IBM put forward the definition of “E-commerce” in 1996, a series of research over E-commerce have been done during these years.

In traditional commerce, one definition of customer value contains product value, own value, use value and total value (burn, 1993) [1]. Although there are some differences in other definitions of customer value, all of them are based on traditional commerce background. In e-commerce, the definition of customer value becomes more comprehensive. Besides elements contained in traditional definition, other new elements such as website image value, website reputation and website hits rate are involved in the e-commerce definition. As a result, measuring customer value in e-commerce is a huge project and needs lots of entrepreneurs and scholars to solve it. In this paper, our key point is to establish a general framework of customer value.

### 2. The Generation Of Problem and Data Collection

According to the research of Glaser and Strauss, using grounded theory can be divided into following steps: the generation of problem, data collection, data decoding and theory development. In this paper, we will follow these four steps to discuss customer value.

In this paper, we mainly discuss how to establish a general model to analyze customer value in customer's aspect. In 1956, Peter Drucker pointed out that what customer purchase and consumer is value, not product. As a result, most of scholars used the concept of “customer value”, but no one gave a clear definition of it. In 1988, Zaithaml (1988) firstly proposed customer perceived value in customer aspect [2]. She gave a definition that customer perceived value is an integral evaluation of benefits that customer could perceive and service of product. In the following years, scholars had defined customer value in different ways. Bolton and Drew (1991) defined customer value based on input and benefits of customers whose purpose was utility, giving an integral evaluation of it [3]. In other way, Monroe indicated that customers would evaluate benefits of product and service so that they could purchase product even there existed sacrifice [4]. However, most scholars agree with Woodruff's definition of customer value that it is an evaluation of product's attributes and these attributes' utility by customers who is using this product for a certain purpose in a particular scene [5]. In 2006, Kim proposed the segmentation strategies. In his model, customer value can be classified into three categories [6]: (i) segmentation by using only customer value [7], (ii) segmentation by considering both customer value and other information (e.g., customer value, uncertainty, etc.) [8]

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### 3. Decoding and Modeling

#### 3.1. Open decoding

In this part, we interviewed over 100 people who do shopping online frequently. The interview took the products such as clothing, mobile phone, books, which are hot in shopping online, to collect the information.

After a thorough discussion of reviews, we distill some conceptions and categories in 20 conceptions and 112 categories. Some repeated categorizations are merged and some insignificant conceptualizations are abandoned.

Table 1 open decoding (perspective of customer)

category	conceptualization	Dimension
purpose	Communication, convenience, amusement, etc.	5
economic value	cost of money ,cost of time, security of transaction, labor cost, etc.	7
Information value	Accuracy of information integrity of information immediacy of information, etc.	5
emotion value	Popularity, satisfaction of product, satisfaction of service, color tendency, online stores tendency, style tendency, brand tendency, etc.	10
Influencing factor	Comments on website, others suggestions, shopping experience, etc.	5

Table 1 shows 5 total categories, which can be divided into several conceptions.

#### 3.2. Main axis decoding

The purpose of main axis decoding is to discover and build relationships among concepts and categories. As we have distilled lots of concepts and categories in open decoding, it is necessary to develop them into “main categories” and “secondary categories”. Before we use this method, differences between traditional commerce and e-commerce should be emphasized. Although e-commerce can reduce more cost compared with traditional commerce, credit crisis becomes more severe. Nowadays, customers not only concentrate on the price but take sellers’ credit into account. During the whole purchase process, customers’ emotions will decide whether they should buy a product or not. As a result, after using main axis decoding, we can get a specific view that “customers’ emotions” is main category. Before purchase, customers’ emotions may be influenced by lots of comments for the product on e-commerce website; during purchase, it may be affected by price and purchase number of the product; after purchase, if it does not correspond to the description on the website, they will try to return it because of their unhappy emotions.

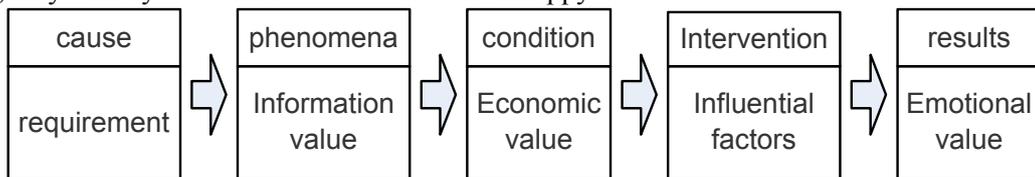


Figure1. Paradigm model of core category

After main axis decoding, we can get a paradigm model shown in fig. It clearly reveals relationships among categories we summarized in open decoding.

#### 3.3. Selectivity decoding

In this process, a core category needs to be chosen and a more distinct explanation of the whole event needs to be developed. As there is only one main category in our main axis decoding, we set it as our core category. On the other hand, as e-commerce is a newly developing type of transaction, a different customer value formation explanation compared with traditional commerce is our focus.

Customers’ purposes to purchase depend on their own requirements or others’ requirements. Then they will search their wanting products on e-commerce websites such as Amazon.com or eBay.com. During their searching, products’ information provided on the website will be considered at first. If the descriptions match with their products, they will compare price of a same product on different e-commerce websites. If they find

out an ideal product, they will read comments for this product by other customers'. Comments will influence their attitudes towards the product. If some negative comments for the product appear on the website, even it is cheap, customers may be give up it and turn to its substitutes. It is because e-commerce customers cannot try the product in reality compared with traditional commerce, others' comments which we define as "influential factors" are important for them to judge their products' values. After products have been purchased on internet, customers' emotions will be influenced by the speed of express companies. If it is too slow to get their products and the quality or use of the product is not as good as they expect, customers' may be return products and it will affect their re-purchase behavior. As a result, customers' emotions play an important role in the whole process.

## 4. Customer Value Model

### 4.1. Customer Value of E-commerce Model

It is clear that customer value is determined by the angle of customers and enterprises. As the models are similar, we take the angle of customers as example. Customers' requirement is the cause of transaction. It is regarded as input information in this model. Because the requirement is undetermined in many cases, it contains influential factors. Meanwhile, other main influential factors should be taken into consideration in customer value. Because these factors affect measurement results of customer value a lot, and sometimes would cause unexpected changes.

As the sequence of transaction, information value is considered first. The integrity, timeliness and accuracy of information which provided in internet affect customers' decision to purchase or not. This information also affects economic and emotional value. Exactly, emotional value determines mostly whether customers are satisfied with the transaction and whether customers are enjoying the procedure. Therefore, the model of customer value can be illustrated as

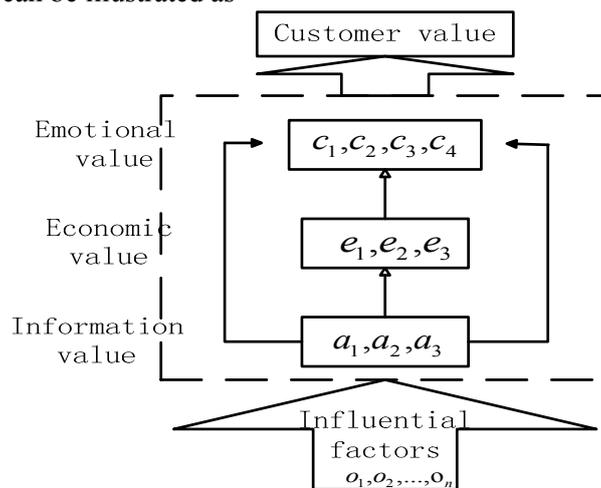


Figure 2 Customer value of e-commerce model

Where  $c_1, c_2, c_3, c_4$  represent the conceptions of emotional value, such as popularity, satisfaction of product, satisfaction of service, colour tendency, etc.  $e_1, e_2, e_3$  represent the conceptions of economic value, such as cost of money, cost of time, security of transaction, etc.  $a_1, a_2, a_3$  represent the conceptions of information value, such as accuracy of information, integrity of information, timeliness of information, etc.  $o_1, o_2, \dots, o_n$  represents kinds of outside influential factors, such as the situation of rivals, instance, shopping experience, other's suggestions, etc.

### 4.2. The Evaluation Value Model

The customer value model in customer's perspective is to provide an evaluation from each customer on the enterprises. Therefore enterprise can upgrade their market strategy and win more customers and eventually becomes competitive. Based on the model above, we divide customer value measure into several groups as follows:

Group1 measures all letters in the customer value of e-commerce model, which is the basis of customer value. It can be measured by evaluation scores. To assess customer value, this is the first and important step. By this step, we can evaluate the groups below.

Group2 measures relationship between components of customer value, which is represented by lines in the fig3. The measurement has been given out by the model above. Using the measurement, the enterprises can find out the problem of service and fix it. In particularly, the model can adjust the exact relationship as the influence of elements changes.

Group3 measures the influential factors on customer value. In fact, many of the influential factors are unexpected. To assess the unexpected influential factors, we choose several main influential factors such as rivals, instance, self experience and other's behavior. Although such influential factors vary a lot among different people, they influence customer value a lot. Hence these factors should be considered and adapted by enterprises.

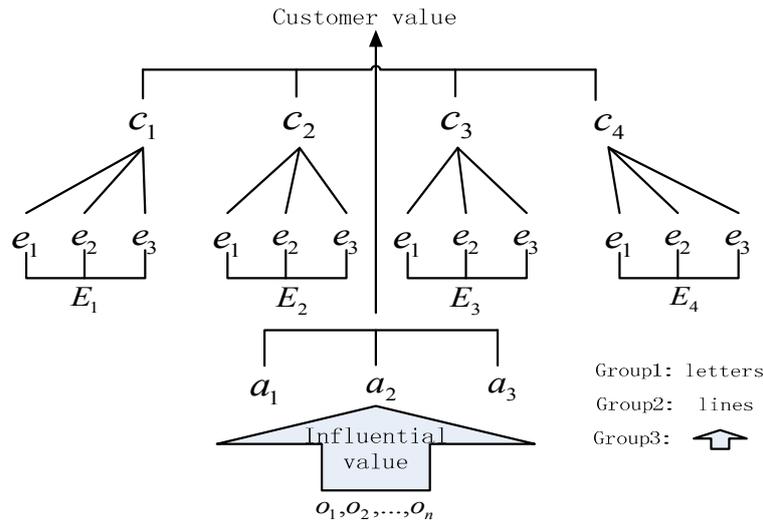


Figure 3 the evaluation value model

Customer value model is illustrated in Fig.3. The 3 Groups have been illustrated before and the relationships between them have been illustrated in model 1. Because of elements of every categorization are too much and bring difficult to study, so only some of the important elements are chosen.

## 5. Empirical Study

In this part, we study customer value in customer's perspective; customer value in enterprise's perspective can be engaged in the same way. As we have data from an e-commerce website called taobao.com, we extract 100 online shopping customers from 2631 customers who share the same purpose of buying books online as samples and we use method of fuzzy comprehensive evaluation to calculate customer value based on our data. In this section of paper, we use a well-developed method AHP to determine weights of indexes in our model.

### 5.1. Determination of index and weight for each level of customer value

We leave messages online to 100 customers which we mention above to do some interviews. Based on these interviews, following the steps of building customer value model above, we determine two levels in our customer value model.

The first-level dimension indexes can be divided into four aspects, such as emotional value, information value, economic value and influential factors. The second level of emotional value contains website reputation, website image value, service satisfaction and product satisfaction. The second level of economic value contains product cost, time cost and labor cost.

The second level of information value contains information accuracy, information integrity and information timeliness. The second level of influential factors contains others' suggestions and shopping experience.

As AHP is well-developed and widespread used in many areas. We directly show the weight of each level obtained by AHP which is based on views of 10 senior customers on taobao.com.

Table 3 weight of customer value

First level	weight	Second level	weight
emotion value	0.4393	Website reputation	0.0459
		Website image value	0.0294

		Service satisfaction	0.1728
		Product satisfaction	0.1912
economic value	0.3251	Product cost	0.1858
		Time cost	0.0929
		Labor cost	0.0464
Information value	0.1469	Information accuracy	0.0793
		Information integrity	0.0240
		Information timeliness	0.0436
Influential factory	0.0888	Others' suggestions	0.0178
		shopping experience	0.0710

## 5.2. Fuzzy Evaluation

From the calculation above, we have got the indexes and weights. After that, we use fuzzy evaluation to calculate the customer value. Assume that the comment set is

$$V = \{v_1, v_2, v_3, v_4\} = \{\text{very important, important, general, unimportant}\}.$$

Because we study on customer value of ecommerce, and such enterprises have large amount of data. So we can translate the data into different level. Take consumption of the customer as example, if the amount of consumption is more than 1000, we remark it as better. If the amount of consumption is more than 500 and less than 1000, we remark it as good. If the amount of consumption is more than 200 and less than 500, we remark it as general. If the amount of consumption is less than 200, we remark it as bad. Similarly, we can gain the comments set of all the categories. Through calculation of 100 customers, we can gain second-level index of website reputation.  $A_{11} = (0.90, 0.10, 0, 0)$  is the comments set of website reputation. It means, in 100 customers, 90 consider website reputation very important, 10 consider it important and so on. Similarly, we can obtain comments sets of other three indexes of emotion value:  $A_{12} = (0.83, 0.10, 0.07, 0)$ ,  $A_{13} = (0.73, 0.21, 0.06, 0)$ ,

$A_{14} = (0.80, 0.10, 0.06, 0.04)$ . Therefore, we can obtain the fuzzy evaluation matrix of first-

$$\text{level } R_1 = \begin{bmatrix} 0.90 & 0.10 & 0 & 0 \\ 0.83 & 0.10 & 0.07 & 0 \\ 0.73 & 0.21 & 0.06 & 0 \\ 0.80 & 0.10 & 0.06 & 0.04 \end{bmatrix}. \text{ Basing on the data shown in table 3, the weight vector of second-level}$$

is  $W_1 = (0.0459, 0.0294, 0.1728, 0.1912)$ . So the comments set of emotion value is  $E_1 = W_1 R_1 = (0.3448, 0.0629, 0.0239, 0.0076)$ .

Similarly, we can calculate all the comments set  $E_i$  ( $i=2,3,4$ ). According to the comments sets of first-

$$\text{level index, whole comments matrix of the customer value is } R = \begin{bmatrix} 0.3448 & 0.0629 & 0.0239 & 0.0076 \\ 0.2461 & 0.0474 & 0.0307 & 0.0009 \\ 0.0976 & 0.0325 & 0.0147 & 0.0021 \\ 0.0483 & 0.0215 & 0.0114 & 0.0076 \end{bmatrix}. \text{ And}$$

the whole comments set of customer value is  $E = WR = (0.2501, 0.0497, 0.0237, 0.0046)$ . If more specific evaluation scores are needed, the comments set can be supposed to  $V = \{v_1, v_2, v_3, v_4\} = \{10, 7, 4, 1\}$ . In this way, we can obtain the specific evaluation scores, and the result is shown below:

Table 4 weight of customer value

	Evaluation grade	Evaluation score
The whole customer value	Important	2.9483
Emotion value	Very important	3.9915
Economic value	Important	2.9165
Information value	General	1.2644
Influential factory	Unimportant	0.6887

## 6. Conclusion

This paper built a model to evaluate the customer value of e-commerce. To construct the model, the measurement of components, the measurement of relationships between components and the measurement of influential factors are needed for a complete analyze of customer value of ecommerce. In this paper, only the first measurement is calculated to evaluate the customer value. To make the research moving forward, more studies on the rest measurements should be conducted.

Customer value of e-commerce is a huge system. The particularity of e-commerce gives the possibility to acquire large amount of data for an objective result. The model in this paper is based on the data and makes Mass operation possible. In the future, more research on measurement of relationships between components and the measurement of influential factors should be conducted and the difference in composing and measurement of various kinds of products will be researched.

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