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Research on customer perceived value evaluation of logistics public information platform

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ABSTRACT

Marketing management has transferred to client-centered, so enhancing customer perceived value (CPV) based on the evaluation model is the key to success. On the basis of existing literature, the CPV factors identification process and evaluation method of a logistics public information platform (LPIP) were presented. Based on which, a questionnaire on CPV factors of the LPIP was designed to conduct a pretest and formal test. The CPV factors and sub-factors of the LPIP were identified through analysis and processing the collected data by factor analysis method, and the CPV evaluation model of the LPIP was obtained. Finally, the generation process of the CPV evaluation model of the LPIP was summarized to help manager to set up new CPV evaluation model of the LPIP when the environment changed. The research can help managers to enhance customer perceived value based on the evaluation model.

KEYWORDS

Logistics public information platform; Customer perceived value; Questionnaire survey; Factor analysis.

INTRODUCTION

The logistics public information platform (LPIP) is a common architecture for information interaction among the logistics suppliers, demanders, governmental departments, insurance firms, banks, logistics service providers, and other business stakeholders, which is designed to improve the inter-organizational coordination mechanism and the logistics operation efficiency[1]. In recent years, a lot of LPIPs have been set up in PRC. However, there have been few successful LPIPs. The key to a successful LPIP is not technology, but the business mode. In the customer-oriented economic times, a successful LPIP must be "customer-oriented", which, on the one hand, is able to create value for customers, and on the other hand, requires a large number of users, and has certain profit margin and development potential.

In the 1980s, Professor Poter. M of Harvard Business School pointed out in his Competitive Advantage: The competitive advantage comes from the enterprise to create customer perceived value which is more than the cost[2]. Customer perceived value is the source of competitive advantage for enterprises. When customers approve more customer value from firm, customer satisfaction will be increased, same as customer loyalty and Word-of-Mouth Effects. So customers will buy the firm's products or services repeatedly. On the other hand, the drop-out will be decreased.

Therefore, in the body of this research, the theory and methods of customer value analysis were applied to customer relation management in the LPIP. The introduction is followed by the second section, which looks into factor identification and evaluation method used in this research. The third section presents identification process of LPIP's CPV factors. Generation process of LPIP's CPV evaluation model and the model gained in this research are allocated in the fourth section. Finally, the research is concluded in the fifth section.

Besides, currently, the customer value is researched from three perspectives –customer's, firm's, and both[3]. The LPIP customer value discussed in this study is based on the perspective of customers, to research the value the customers obtain from the services provided by the LPIP. To distinguish it from the customer value from other two perspectives, we call it customer perceived value in this study, and define customers as the supplier and demander of the logistics services.

FACTOR IDENTIFICATION AND EVALUATION METHOD

CPV factors identification process

Currently, CPV factors are identified mainly based on questionnaire survey, recurrence induction method, screening and confirmation. For example, Parasuraman et al. first concluded ten dimensions influencing the service quality with qualitative research like interview based on the service characteristics, and then generated the SERVQUAL model consisting of five dimensions and 22 items through two rounds of questionnaire survey, data analysis, inducing and screening[4]. According to practical situation, the CPV factors of the LPIP were identified by adopting the method used by Parasuraman et al. in exploring the SERVQUAL model. The basic steps as below:

(1) First, the first hierarchy of hypothetical driving factors was put forward through literature review and LPIP background investigation;

(2) The sub-factors of the first hierarchy was generated through qualitative interview with the people who get familiar with the LPIP;

(3) Based on the sub-factors, test and collect data with few samples on a small scale, a questionnaire was prepared, then the data was analyzed in order to generate a preliminary scale through inducing and screening the dimensions and sub-factors;

(4) A questionnaire with the preliminary scale was made again, data with more samples on a large scale was collected, then the data was analyzed again, and finally generate a formal scale.

CPV evaluation method

After the CPV factors of the LPIP were identified, how to evaluate the CPV is the key task of the next stage. Gale proposed a CPV evaluation method based on quality and price dimensions :"Customer Value Map"[5]. Woodruff added the "Inter-Firm Performance Difference" dimension based on the research results of Gale, the importance and competition difference were measured directly with two scales: CPV driving factor importance scale and inter-firm competition difference scale, and the importance/competition difference matrix was built to analyzed the value factors[6]. Ulage proposed the famous "respective value drivers profile" method through empirical study[7]. In this study, the CPV evaluation model of the LPIP was build based on the "respective value drivers profile" method of Ulage, with the expression shown in formula (1):

$$CPV = \partial_1 x_1 + \partial_2 x_2 + ... + \partial_i x_i \quad (1)$$

Where, CPV is the customer perceived value, x_i stands for each driving factor of CPV, ∂_i is the weight of the influence of the driving factor.

CPV FACTORS IDENTIFICATION PROCESS OF THE LPIP

The first hierarchy of CPV driving factors

Some driving factors of the CPV were mentioned for its definition and evaluation models in the CPV literature. Considering that LPIP has the characteristics of e-commerce, e-intermediary, in this study, we understood related literature on CPV and its driving factors of the service industry, e-commerce service and e-intermediary service. Then, main driving factors in the first layer were summed up. The main views of scholars referred to in this study are as shown in TABLE 1.

TABLE 1 : Main CPV driving factors of service industry, e-commerce service and e-intermediary service

Author	Main CPV Driving Factors
Parasuraman,Zeithaml et al[4]	Tangibles, reliability, responsiveness, assurance, empathy
Zeithaml, Parasuraman et al[8]	Reliability, Accessibility, security, ease of navigation, assurance/trust, site aesthetics, responsiveness, personalization/customization, price knowledge, flexibility, and efficiency
Bourdean[9]	Social value, utilitarian value, hedonic value, learning value, and purchasing value
Li Chunqing, Sun Ying et al[10]**Error! Reference source not found.**	Trust, ease of use, responsiveness, and reliability
Meng Qingliang, Han Yuqi et al[11]	Product quality, cost, time of obtaining product, convenience, purchasing enjoyment, security, environmental impact, and empathy
Wang Huailin, Chen Mingzhi et al[12]	Convenience, product price, personalized experience, security technology, product information, and use cost
Wu Shuang[13]	Functional value, information value, personnel value, and economic value
Lei Xinghui, Zhang Wei[14]	Social value, functional value, emotional value, and program value

The research of CPV in the above literature involves the traditional service industry, overall e-commerce environment, and the subdivided different e-commerce environments. The measurement from such dimensions as social value, functional value, information value, and emotional value belongs to the perceived profits. Product price and use cost belongs to perceived benefit loss. All of these views are not completely applicable to the research on CPV of the LPIP, but are of great reference significance. Therefore, in this paper, we screened these views, based on which, the background investigation and qualitative interview were conducted, and a set of complete test items were established.

According to the document retrieval results, and based on the interview with some domestic LPIP logistics suppliers, demanders, operation and maintenance staffs, and researchers, CPV driving factors of the LPIP were first divided into five driving factors (dimensions): functional value, social value, emotional value, program value, and perceived sacrifices, and then the detailed items was gained through qualitative interview. For example, during the interview with users, the detailed items of functional value, were gained by three different levels of service modes: logistics information sharing and exchange, logistics transaction management, and logistics value-added services; detailed items of social value were obatined from communication, corporate image, personalized service, etc.; for emotional value, detailed items were gained based on communication between customers and staffs of LPIP; the detailed items of program value were obtained from the technological performance and management system of the platform, etc. The detailed items of perceived Sacrifices were gotten according to the monetary cost, time and energy cost of accepting the services. Finally, an item set of CPV sub-driving factors with 33 detailed items was summarized.

Pretest

Based on the 33 detailed items formed in the previous stage, we added four demographics characters of interviewees, and an open-ended question, thus forming a pretest questionnaire. It was expected to identify the items' importance to customers through the pretest, then delete the items that the customers deem unimportant, and add the driving factors (items) that are neglected but important.

After designing the questionnaire, a pre-inspection was conducted in order to improve the effectiveness of the items of the questionnaire. Forty postgraduates and teachers who are familiar with the LPIP were invited to make a special discussion on the questionnaire. They were asked to fill the questionnaire, and to give opinions and suggestions about the completeness of measurement items, explicit meanings of words, and whether there were any correlation and inclusion relations among the items. The pretest was conducted by random sampling in a networking group of logistics public information personal, and 24 effective questionnaires were returned. After the data were analysed by descriptive analysis, 5 unimportant items with an

average value of less than 3 were deleted, and the rest 28 items were adopted to formal testing. Please see TABLE 2 for detailed items.

TABLE 2 : Detailed items

Dimensions	Items
Functional value	1.1Provision of an enterprise display platform ; 1.2 Timely release, searching and sharing of information on sources of goods and vehicles, transaction, etc. by user 1.3 Timely provision of market operation situation by the platform 1.4 Timely and accurate non-loss data exchange 1.5 Automatic matching or recommendation of logistics service supply and demand information 1.6 Whole-process logistics transaction management service 1.7 value-added credit supervision service 1.8 Business service of mobile terminals like mobile phone 1.9 GPS&GIS&RDIF-based logistics tracking services 1.10 Logistics SaaS service 1.11 Integrated logistics solutions 1.12 Logistics business data analysis and other decision-making supports
Social value	2.1 Improvement of corporate image 2.2 Obtaining logistics knowledge and policy information 2.3 Good communication mechanism and environment of virtual community provided by the platform 2.4 Frequent online and offline theme activities
Emotional value	3.1Information service actively provided by the platform based on your demands 3.2 Timely, accurate and reliable information provided by the platform staff 3.3 Patiently listening to your feedback and timely solution to your problems by the platform 3.4 Personalized services in the whole process from initial software training 3.5 High integrity of platform transaction
Program value	4.1 Security of EDI data exchange 4.2 High transaction security (payment security) 4.3 Attractive platform design, and strong information navigation ability 4.4 Rapid process response speed
Perceived sacrifices	5.1 Currency cost 5.2 Time cost 5.3 Platform leaning energy cost

Formal testing

In the formal testing stage, the network questionnaire survey, EMAIL questionnaire survey and direct interview were employed. The basic data were obtained by these three ways.

The questionnaire survey was conducted from March to April 2014. One hundred and twenty one copies of questionnaire were acquired, and some invalid copies were deleted through screening the duration of answering the questionnaire, deleting the copies of the same IP or the same answers, and deleting the copies with all of the scores being some extreme value, etc., then 96 copies of the effective questionnaire, all of which had no missing value, were retained. Effective recovery rate was 79.3%. The number of effective samples meets the requirements that the sample size should be at least five times of the number of questionnaire items. The result showed that about 63% respondents's age raged from 35 to 45; 36% respondents were business personnel and 23% were intermediate managers; about 61% responders worked in the firm as logistics service demanders, others as logistics service suppliers; about 38% responders checked LPIPs more than once a day.

Five-point Likert scale was used in the questionnaire. The importance of items was a number from 1 to 5, of which, 1 = not all important, 2 = slightly important, 3 = moderately important, 4 = very important, and 5 = extremely important. The higher the number is, the more important the item will be. The average value of the items ranged from 3.44 to 4.33, all more than 3; the median includes 3, 4, and 5; and the standard deviation ranged from 0.676 to 1.23, all more than 0.5. The value of the 28 items basically ranged from 1 to 5, and the distribution of these 28 items in the five levels was comparatively even, which showed that there was sufficient variation information in the data, contributing to the later information extraction.

Data analysis

The objective of data analysis is to condense the information by factor analysis method, to explore the intrinsic value appeal of customers behind the CPV directly measured with the factors obtained in the questionnaire.

First, it is required to analyze the correlation of items under each dimension, and obtain the concentration factors by factor analysis method if there is a correlation, then analyze the correlation of items under the 5 dimensions, and learn about the correlation among the items. We found that the items under different dimensions had a strong correlation by observing the pairwise correlation coefficient matrix, showing the information overlapping among the items. Therefore, it's necessary to condense information and determine the importance of items by factor analysis.

Factor analysis is a multivariate statistics method. Through researching the internal dependency of the correlation coefficient matrix among multiple variables, a few random variables that can integrate all variables are extracted. These random variables cannot be measured directly, which are common factors. It aims to reduce the number of variables, and explain the original problems with a few common factors instead of the original variables. The basic model is as blow:

Supposing there are N samples, P measurable indexes, $X = (x_1, x_2, ..., x_P)^T$, and the unmeasurable common factor is $F = (F_1, F_2, ..., F_m)^T$, then the basic model is as shown in formula (2):

$$\begin{cases} X_1 = a_{11}F_1 + a_{12}F_2 + ... + a_{1m}F_m + \varepsilon_1 \\ X_2 = a_{21}F_1 + a_{22}F_2 + ... + a_{2m}F_m + \varepsilon_2 \\ ..... \\ X_P = a_{P1}F_1 + a_{P2}F_2 + ... + a_{Pm}F_m + \varepsilon_P \end{cases} \quad \textbf{(2)}$$

Where, the matrix $A=(a_{ij})$ is a factor loading matrix, a_{ij} is a factor loading, i.e., the correlation coefficient of the common factor F_i and the variable X_j. The more the a_{ij} is, the more the loading of the common factor F_i on the variable X_j will be. ε_i is a special factor, denoting the influencing factor besides the common factor, which can be neglected in application.

After obtaining the common factor, factors analyzing model can be obtained by using regression estimation. Each common factor is expressed in the linear form of the variables, as shown in formula (3). The scores of factors can be calculated to make a comprehensive evaluation on the analysis object.

$$F_i = b_{i1}X_1 + b_{i2}X_2 + ... + b_{iP}X_P \qquad (i = 1,2,..., m) \quad \textbf{(3)}$$

In this research, the following requirements were noted when applying the factor analysis in practice:

(1) The sample size should not be too small. In this study, there are 96 effective samples, and the functional value only covers 12 variables (It has the highest numbers of variable).

(2) The variables should have correlations. If the variables are independent, it is impossible to extract the common factor. Actually, the items under different dimensions generally have correlations, and are judged by the Bartlett's Test of Sphericity.

(3) Partial correlation among variables should be inspected. In this study, partial correlation among factors with KMO were tested. The more the KMO statistic approaches 1, the stronger the partial correction among variables will be, and the better the factor analysis effect will be. In the practical application, the KMO statistic should be above 0.7, so as to obtain a better effect. In this study, the results meet this requirement.

(4) The common factors in the factor analysis should be of practical significance. In the principal component analysis, the principal component stems from matrix transformation. This method enables the first common factor to carry information as much as possible, and the second common factor to carry the rest information as much as possible, but it is very difficult to explain the practical significance of the common factors. In this study, to give practical significance to the common factors, the factors were extracted by principal component analysis and rotated by varimax, to make the common factors easy to understand.

In this research, each dimension of the CPV of the LPIP was analyzed by the factor analysis method, hoping to condense information and obtain the weight coefficient matrix of the measurable items through factor analysis. Here, the functional value was taken as an example to explain the factor analysis.

The functional value items of 96 effective samples were analyzed by the factor analysis method with SPSS STATISTICS 20. The result of the Bartlett's Test of Sphericity of the functional value was significant. The KMO value is 0.833. As mentioned above, the KMO value is more than 0.7, with a better factor analysis effect, indicating that the data meet the requirements.

First, the general principal component analysis method was adopted for the factor analysis, but the common factors obtained were not easy to understand and explain. Therefore, the common factors was rotated by varimax, to change the distribution of the original information among the common factors, and then the scores of the common factors was calculated by regression method. Finally, 3 common factors were extracted, which contained 12 items and accounted for 77.16% variance showed in TABLE 3. The later factor explanation effect was very good.

TABLE 3 : Total variance explained of functional value

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulative %
1	6.177	51.475	51.475	3.578	29.816	29.816
2	1.999	16.660	68.134	3.116	25.964	55.779
3	1.083	9.026	77.160	2.566	21.381	77.160
4	0.645	5.377	82.537			
5	0.543	4.525	87.062			
3…	…	…	…			
12	0.100	0.831	100.000			

Extraction method: principal component analysis.

As shown in TABLE 4, each item corresponded to a common factor with factor loading higher than 0.5, and the rest with factor loading lower than 0.4. Meanwhile, each common factor at least included 3 items with factor loading more than 0.5, indicating the ideal discriminant validity and convergent validity of the factors. Therefore, the results indicated that the scale had well construct reliability, discriminate and convergent validity. Finally, the functional value's scale of the LPIP was consisted of 3 common factors and 12 items. We analyzed and concluded the meanings of the 3 common factors. The 3 factors were named as per their contributions in a descending order: advanced value-added services value, IT support services value and basic information services value.

TABLE 4 : Rotated component matrixa of functional value

Factor	Component		
	1	2	3
1.1	0.147	0.830	0.334
1.2	0.265	0.110	0.882
1.3	0.328	0.197	0.804
1.4	0.239	0.748	0.010
1.5	0.284	-0.015	0.800
1.6	0.711	0.261	0.306
1.7	0.814	0.192	0.301
1.8	0.701	0.331	0.303
1.9	0.136	0.894	0.108
1.10	0.356	0.847	-0.048
1.11	0.813	0.261	0.206
1.12	0.881	0.135	0.241

Extraction method: principal component analysis; a. rotation converged in 6 iterations.

In addition, the other four value dimensions are respectively condensed into a common factor through factor analysis, with the cumulative contribution ranging from 65% to 82%, significant Bartlett's Test of Sphericity, and the KMO value being more than 0.7, indicating a good factor analysis effect.

Conclusion of the scale

First, the first hierarchy of hypothetical driving factors were put forward through literature review and LPIP background investigation; then the items (sub-factors) of the first hierarchy of driving factors were generated through qualitative interview with the persons who get familiar with the LPIP operation mechanism; a questionnaire was made, a pretest with few samples was conducted on a small scale, and a preliminary scale was generated through conclusion and screening of the items; a questionnaire was made again with the preliminary scale, and finally a scale consisting of five dimensions was obtained through data analysis by factor analysis method. The functional value covered 3 factors, and the social value, emotional value, program value and cost value are respectively merged into a factor. The final structure scale of CPV factors of the LPIP is shown in TABLE 5.

CPV EVALUATION MODEL OF THE LPIP

Generation process of the CPV evaluation model

Analysis result of Section 3 revealed that the function value composed of 3 common factors: advanced value-added services value, IT support services value, and basic information services value. The score of each common factor was obtained for each sample from the score coefficient matrix, and then the functional value score of each sample was calculated based on the standardized variance contribution of the 3 common factors. Customer values of the other 4 dimensions were respectively condensed into a single common factor, and then the final score of each sample was obtained on these 4 dimensions directly from the score coefficient matrix. Finally, the weights of the five dimensions were obtained by the linear regression method, and the CPV evaluation model of the LPIP was established.

TABLE 5 : Structure scale of CPV factors of the LPIP.

Driving factors	Number of sub-factors	Questionnaire No.	Factor Loading
Advanced value-added services	5	1.6	0.711
		1.7	0.814
		1.8	0.701
		1.11	0.813
		1.12	0.881
IT support service	4	1.1	0.830
		1.4	0.748
		1.9	0.894
		1.10	0.847
Basic information services	3	1.2	0.882
		1.3	0.804
		1.5	0.800
Social value	4	2.1	0.908
		2.2	0.913
		2.3	0.919
		2.4	0.865
Emotional value	5	3.1	0.716
		3.2	0.890
		3.3	0.825
		3.4	0.789
		3.5	0.817
Program value	4	4.1	0.894
		4.2	0.917
		4.3	0.924
		4.4	0.896
Perceived Sacrifices	3	5.1	0.941
		5.2	0.772
		5.3	0.839

Evaluation model

Evaluation model of functional value

Score of advanced value-added services

The score model of each factor was obtained by regression estimate method, and each common factor was expressed in the linear form of variables. Concerning the consistency of the data at later stage, the coefficients were standardized to a certain scale to make the sum of the coefficients as 1. The final score of advanced value-added service factor $F_{1.1}$ was calculated in formula (4) as follows:

$$F_{1.1} = 0.162\ X_{1.6} + 0.211\ X_{1.7} + 0.149\ X_{1.8} + 0.221\ X_{1.11} + 0.257\ X_{1.12} \quad \textbf{(4)}$$

Score of IT support services

Same as above, the final score of IT support service factor $F_{1.2}$ was calculated in below formula (5):

$$F_{1.2} = 0.260\ X_{1.1} + 0.219\ X_{1.4} + 0.286\ X_{1.9} + 0.235\ X_{1.10} \quad \textbf{(5)}$$

Score of basic information services

Same as above, the final score of basic information services factor $F_{1.3}$ was calculated in below formula (6):

$$F_{1.3} = 0.366\ X_{1.2} + 0.312\ X_{1.3} + 0.322\ X_{1.5} \quad \textbf{(6)}$$

Variance contributions of the 3 common factors of the functional value were respectively: 29.816%, 25.964%, and 21.381%. Variance contribution is a significant index to evaluate the importance of a common factor, and the variance contributions of these 3 common factors were standardized, and the standardized data were used as the weights to evaluate their social values, and finally the evaluation model of the functional value was established as shown in formula (7).

$$F_1 = 0.385\ F_{1.1} + 0.336\ F_{1.2} + 0.279\ F_{1.3} \quad \textbf{(7)}$$

Evaluation model of social value

Items of the social value dimension were condensed into one common factor. Therefore, we can directly obtain the score model by the method of regression estimation and express each common factor into the linear form of variants. Concerning the consistency of the data, the coefficients were standardized to a certain scale to make the sum of the coefficients as 1. The final score of social value F_2 was calculated in below formula (8):

$$F_2 = 0.252\ X_{2.1} + 0.253\ X_{2.2} + 0.255\ X_{2.3} + 0.240\ X_{2.4} \quad \textbf{(8)}$$

Evaluation model of emotional value

Similar to the analysis process of the social value, the final score of emotional value F_3 was calculated in formula (9):

$$F_3 = 0.178\ X_{3.1} + 0.221\ X_{3.2} + 0.204\ X_{3.3} + 0.195\ X_{3.4} + 0.202\ X_{3.5} \quad \textbf{(9)}$$

Evaluation model of program value

Similar to analysis process of the social value, the final score of program value F_4 was calculated in formula (10):

$$F_4 = 0.246\ X_{4.1} + 0.253\ X_{4.2} + 0.254\ X_{4.3} + 0.247\ X_{4.4} \quad \textbf{(10)}$$

Evaluation model of cost perception

Similar to the analysis process of the social value, the final score of cost perception F_5 was calculated in formula (11):

$$F_5 = 0.368\ X_{5.1} + 0.302\ X_{5.2} + 0.330\ X_{5.3} \quad \textbf{(11)}$$

CPV evaluation model of the LPIP

Assumed that the importance of functional value, social value, emotional value, program value, and cost perception have multiple linear relationship with CPV. Then, based on the results of the questionnaire, the average value of the items was obtained as the dependent variable, while the results of the evaluation models for functional value, social value, emotional value, program value, and cost perception were used as the independent variable, so as to establish a multiple linear regression model.

In this study, in order to eliminate the influence on the average value calculation caused by different number of items of different dimensions, the arithmetic mean value of the importance of each dimension $\overline{X_1}, \overline{X_2}, \overline{X_3}, \overline{X_4}, \overline{X_5}$ were calculated respectively first, and then the importance of the overall value of each sample $\overline{X}$.

Taking $\overline{X}$ as the dependent variable, and F_1, F_2, F_3, F_4, and F_5 as the independent variable, a linear regression model was established. According to the results, the models had high fitting degree and applicability; meanwhile, the result of F-test had shown that the linear relationship existed between the independent variable and the importance of overall value (CPV); besides, each independent variable passed Student t test. Therefore the explanatory variables had a remarkable influence on the explained variable, i.e. the CPV. Then, the final CPV evaluation model of the LPIP was established as shown in formula (12).

$$CPV = 0.035 + 0.206\ F_1 + 0.200\ F_2 + 0.201\ F_3 + 0.189\ F_4 + 0{,}196\ F_5 \quad \textbf{(12)}$$

In practical operation, customers give scores on the performance of the 28 items; then the scores of the 3 principal factors of the functional value will be obtained by formulas (4), (5), and (6); then the score of functional value F_1 will be got by formula (7). Meanwhile, by substituting the items 2.1-2.4, 3.1-3.5, 4.1-4.4, and 5.1-5.3 corresponding to into formulas (8) - (11), each customer's scores F_2, F_3, F_4, and F_5 can be obtained respectively. Putting the mean value of the five dimensions into the LPIP customer value evaluation model formula (12), the final score of the CPV of the LPIP can be obtained.

During the specific evaluation process, the final CPV score of an LPIP can be obtained according to the flow shown in Figure 1. The CPVs of different platforms can be compared by using "respective value drivers profile" to analyze their advantages and disadvantages and seek for means to increase their CPVs.

As shown in Figure 1, after obtaining the scores for each driving factor, we can connect the scores in five driving dimensions in the chart, to form a pentagon. Scores of different LPIPs can be put into the same chart, by means of which, we can not only have the total score of each LPIP, but also compare the values of each driving factor dimension of different

LPIPs. To ensure the sum of the weights of all below value driving factors is equal to 1, the coefficients of formula (12) were standardized.

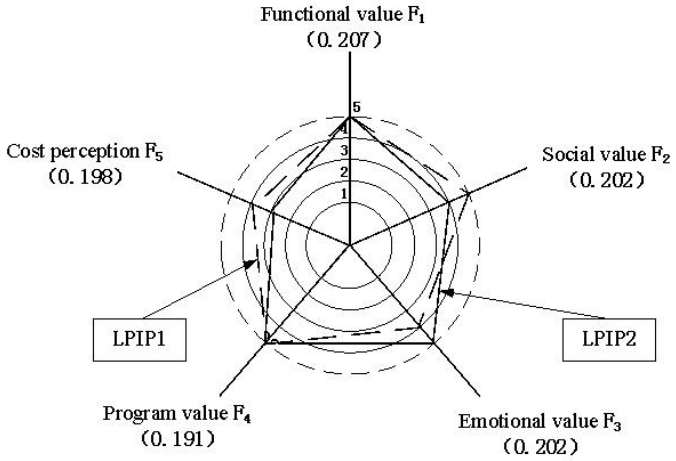

Figure 1 : CPV driving factors perspective diagram of the LPIP.

CONCLUSIONS

This research developed the identification flow and evaluation method for CPV factors of the LPIP. According to this flow and method, CPV driving factors and sub-factors of the LPIP were determined, and the CPV evaluation model of the LPIP was obtained. Based on the results of this study, we put forward some suggestions to help the managers of LPIPs to improve their their CPV in order to contribute to the customers.

(1)The customers have the highest requirements on the function value for it has the highest weight (0.206). In this research, the driving factors of functional value were divided into advanced value-added services, IT support services and basic information services. Different service demands are raised in different developmental stage of LPIPs, then the manager should take different measures to attract customers in different stage.

(2)The weight of the emotional value is second, which means the LPIP customers have gradually entered the "Perceptual Consumption" stage. At this stage, customers focus no more on the quantity or quality of a product, but the emotional links with LPIP websites.

(3)The weight of the social value, which is almost the same as that of the emotional value, represents the special demands of customers of the LPIP as a web-based platform. The customers want to present a good social image, obtain the required policy information, and establish solid social network with help from such platform.

In combination with the "driver element of perspective Figure", this evaluation model can be used to evaluate the advantages and disadvantages of the CPV of different LPIPs. Managers can make sure in which stage the LPIP is, and take effective measures to increase CPV to attract more existing and potential customers. As a result, the LPIPs will integrate more logistical resources, and more comprehensive logistics service network will be built.

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