A Method of Evaluating Car-Hailing Service Quality

Qiliang Ren, Cong Bai[*] and Ziyu Zhao

School of Traffic and Transportation, Chongqing Jiaotong University, Chongqing 400074, China

[*]Corresponding author

Abstract—**In order to improve the scientific quality of car-hailing service quality evaluation, the service quality of car-hailing was divided into three main dimensions: service environment quality, service interaction quality and service result quality from the perspective of service process. The specific measures included in the three main dimensions were included. As a sub-dimension, factor was used to construct a multi-dimensional and multi-level service quality evaluation index system. The potential variables and observed variables were determined according to the characteristics of each index. The structural equation model map was drawn according to the structural equation theory model, and the path coefficient was normalized. According to the theory of matter-element extension, the evaluation method of car-hailing service quality was proposed, the service quality evaluation level of car-hailing was determined, and the service quality of Chongqing city car service was selected and evaluated. The results show that the multi-dimensional and multi-level evaluation index system more fully reflects the quality characteristics of the car-hailing service, and the evaluation model can more scientifically and reasonably evaluate the quality of the car-hailing service.**

Keywords—traffic engineering; car-hailing; service quality; evaluation system; structural equation modeling; matter element extension theory

I. INTRODUCTION

As a rental passenger transport mode under the background of "Internet +", the car-hailing service model solves the problem of the asymmetry of traditional rental passenger information and makes outstanding contributions to improving the comprehensive competitiveness of rental passenger transport[1]. With the continuous expansion of the car-hailing and the legalization of car-hailing service model, China's car-hailing service model has been standardized. However, there are still many problems in the quality of car-hailing service, caused by factors such as inadequate regulation and loose supervision[2]. Therefore, the construction of a scientific comprehensive evaluation method for car-hailing service quality is conducted to prove the quality of car-hailing service, standard the mode of car-hailing service and improve the quality of residents' travel, etc.

The car-hailing service model represented by Uber was first established in California, and California was also the first city to recognize the legality of car-hailing. YiDao Car was the earliest company in China to developed car-hailing service model. Joshua Paundra &Laurens Rook[3] analyzed the effects of individual psychological factors and vehicle attributes on passenger perceived service quality. Gooi Sai Weng&Suhaiza Zailani[4] concluded that perceived risk is an important factor in the quality of car-hailing service by data analysis. Mingshu Wang&Lan Mu[5] took the waiting time and running time as the standard for the evaluation of the service quality of car-hailing. Wang Jing[6] pointed out that the review mechanism, service evaluation mechanism and complaint mechanism are important indicators for evaluating the quality of car-hailing service. Zhao Daozhi[7] analyzed the impact of price control strategies on car-hailing service quality. Ying Chang constructed a car-hailing pricing measurement model and a cost linkage pricing model, and discussed the dynamic adjustment mechanism of the car-hailing cost and freight rate linkage. The existing achievements mainly focus on factors affecting the quality of car-hailing service and price setting, etc. The research on the evaluation of the service quality of car-hailing needs to be further improved.

II. INDEX SYSTEM CONSTRUCTION

The multidimensional nature of the service quality of Car-hailing reflects that Car-hailing service is a highly complex process. Therefore, the construction of multi-dimensional and multi-level evaluation index system can better describe the complexity of passengers' perceived behavior process. According to the characteristics of Car-hailing service, the targeted main dimension and sub-dimension are set to reflect the relationship between different dimensions and different levels, which not only reflects the passengers' perception of service quality, but also reflects the relevance of different evaluation indicators of Car-hailing service quality. Referring to the service quality dimension classification standard proposed by Rust and Oliver[8] and regarding Car-hailing service as a complete process. The overall level of Car-hailing service is examined from three main dimensions: service environment quality, service interaction quality and service result quality, and build a multi-dimensional and multi-level service quality measurement model. It can fully reflect the passenger's overall perception of the service environment from the time of receiving the service, the dynamic interaction with the service subject in the service process, and the direct experience and service quality perception of the service effect at each stage after receiving the service. Consistent with the traditional service quality perception process, the quality of service experienced by passengers during the ride is also examined from these three dimensions. Therefore, the service environment quality, service interaction quality, and service result quality can be regarded as the main dimensions of Car-hailing service quality measurement model. Its sub-dimension

is the specific measure factor contained in the three main dimensions, and each main dimension contains multiple sub-dimensions. As shown in Table 1, it can be seen that the three main dimensions imply the passenger's perception of the service quality of Car-hailing, and the corresponding 13 sub-dimensions can also reflect the connotation of the three main dimensions.

TABLE I. ANALYSIS OF THE CONTENT OF CAR-HAILING SERVICE QUALITY

Master code	Number	Sub-code	Measure level
Car-hailing Service η	1	Perfection of safeguard mechanism X_1	Service environment quality ξ_1
	2	Stability of market order X_2	
	3	effectiveness of supervision and management X_3	
	4	Reliability of driving behavior X_4	
	5	Vehicle performance reliability X_5	
	6	Service platform reliability X_6	
	7	Fluency of evaluation system X_7	Service interaction quality ξ_2
	8	Feedback of Complaint Handling X_8	
	9	Normativeness of service behavior X_9	
	10	Confidentiality of passenger information X_{10}	Quality of service results ξ_3
	11	Comfort of the ride environment X_{11}	
	12	Driver's morality X_{12}	
	13	Rejection value X_{13}	

According to the analysis of the quality measurement dimension of car-hailing service, in the sub-dimension layer, the related dimensions are not only different but also highly correlated with each other, and also reflect the same theme, forming the upper main dimension facet. And the three main dimensions reflect a higher level factor -the quality of car-hailing service. Therefore, a multi-dimensional and multi-level evaluation system for the quality of car-hailing service can be constructed. As shown in Figure 1.
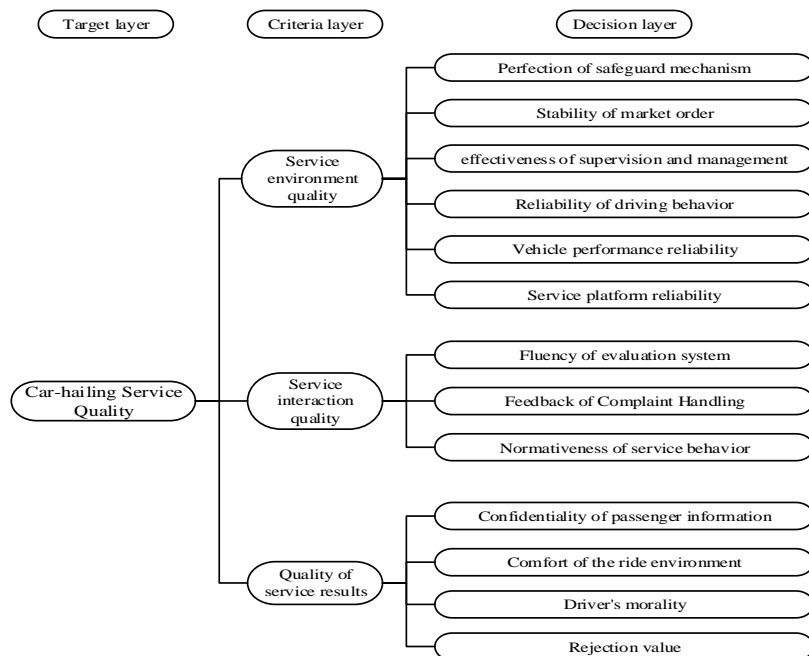

FIGURE I. MULTI-DIMENSION AND MULTI-LEVEL NETWORK APPRAISAL INDEX SYSTE

III. EVALUATION METHODS

A. Determination of Index Weights Based on Structural Equation Model

Due to the different types and measurable degrees of the service quality evaluation indexes of car-hailing, variables that cannot be directly measured in the service quality of car-hailing and the three main dimensions are defined as potential variables, and 13 indicators, such as the perfection of guarantee mechanism and stability of market order, can be directly measured. The observation variables are represented by $X_1, X_2, \ldots, X_{13}$. The three main dimensions are determined by the goodness of guarantee mechanism, stability of market order and other indicators, which are defined as potential variables ξ_1, ξ_2 and ξ_3. The comprehensive evaluation of car-hailing service quality is defined as internal derivative potential variable η. In summary, the assumptions are as follows:

H1: Comprehensive evaluation of car-hailing service quality is a high-order factor of service environment quality, service interaction quality and service result quality;

H2: The quality of the service environment is a high-order factor of the perfection of guarantee mechanism, the stability of the market order, the effectiveness of supervision and management, the reliability of driving behavior, the reliability of vehicle performance, and the reliability of the service platform;

H3: Service interaction quality is a high-order factor of evaluating system smoothness, complaint handling feedback, and service behavior normative;

H4: Service result quality is a high-order factor of passenger information confidentiality, riding environment comfort, driver morality and rejection value;

H5: Service environment quality has a positive direct impact on the high order factors of overall evaluation of car-hailing service quality. The higher the quality of service environment, the better the comprehensive evaluation is, and vice versa;

H6: Service interaction quality has a direct positive impact on the higher order factors of comprehensive evaluation of car-hailing service quality. The higher the quality of the service interaction, the better the comprehensive evaluation is, and vice versa;

H7: Service result quality has a positive direct impact on the high order factors of comprehensive evaluation of car-hailing service quality. The higher the quality of the service results, the better the comprehensive evaluation is, and vice versa;

H8: The perfection of guarantee mechanism, stability of market order, effectiveness of supervision and management, reliability of driving behavior, reliability of vehicle performance and reliability of service platform have a positive direct impact on the higher order factors of service

environment quality. The higher the result, the better the quality of the service environment is, and vice versa;

H9: The accessibility of the evaluation system, the feedback of complaint handling and the service behavior norm have a positive direct impact on the high order factors of service interactive quality. The higher the result, the better the service environment quality is, and vice versa;

H10: Passenger information confidentiality, riding environment comfort, driver morality and rejection value have a direct positive impact on the higher order factors of service result quality. The higher the result, the better the service environment quality is, and vice versa.

According to the theoretical model of structural equation, the structural equation model diagram for the comprehensive evaluation of car-hailing service quality is drawn, as shown in Fig. 2. Among them, the ellipse represents the latent variable and the square represents the observed variable. In the figure, X1, X2, …, X13 correspond to X1, X2, …, X13 in Table 1; $\xi1$, $\xi2$, $\xi3$ correspond to ξ_1, ξ_2, ξ_3; e1, e2, …, e13 represent exogenous observation variable errors; ζ_1, ζ_2, ζ_3 represent the error of the extrinsic latent variable; δ represents the error of the internal derivative potential variable; $\lambda1$, $\lambda2,\ldots,$ and $\gamma1$, $\gamma2$, $\gamma3$ are path coefficients.
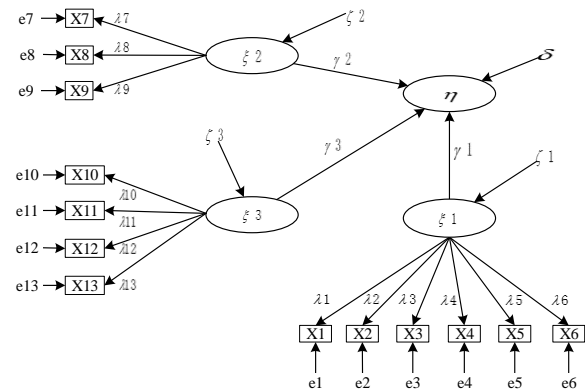

FIGURE II. EVALUATION SYSTEM PATH MODEL DIAGRAM OF CAR-HAILING SERVICE QUALITY

According to Fig.2, the structural equation model can be constructed as follows:

$$
\begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_{13} \end{bmatrix} = \begin{bmatrix} \lambda_1 & 0 & 0 \\ \vdots & \vdots & \vdots \\ \lambda_6 & 0 & 0 \\ 0 & \lambda_7 & 0 \\ 0 & \lambda_8 & 0 \\ 0 & \lambda_9 & 0 \\ 0 & 0 & \lambda_{10} \\ \vdots & \vdots & \vdots \\ 0 & 0 & \lambda_{13} \end{bmatrix} \times \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ \vdots \\ e_{13} \end{bmatrix} \quad \begin{bmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \end{bmatrix} = \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \end{bmatrix} \times \eta + \begin{bmatrix} \zeta_1 \\ \zeta_2 \\ \zeta_3 \end{bmatrix} \quad (1)
$$

$(13 \times 1) \qquad (13 \times 3) \qquad (3 \times 1) \quad (13 \times 1)$

AMOS17.0 was used to construct a complete path map of the service quality evaluation system of car-hailing. The survey data of various observation variables were input to obtain the influence coefficients of explicit variables on latent variables and the path coefficients among related factors, and the weight of evaluation indexes was obtained through normalization processing of these coefficients.

After obtaining the estimated values of the model parameters, the model is evaluated and tested according to Table 2. When the obtained results do not meet the fitting requirements, the model needs to be modified, and the weight of indicators can only be determined until the results are satisfactory.

TABLE II. COMMONLY USED FITTING INDEX OF STRUCTURAL EQUATION MODELING

Adaptive index	Judgment criteria
Chi-square value χ^2	The smaller the better, generally $p > 0.5$ used as a criterion
χ^2 / df	Between 2-3, and the closer to 2, the better the matching of the model
Goodness of fit index GFI	The closer the value is to 1, the better the applicability of the model. In general, GFI>0.9
Approximate root mean square error RMSEA	The closer the value is to 0, the better the applicability of the model. In general, RMSEA<0.1
Canonical fit index NFI	The closer the value is to 1, the better the applicability of the model. In general, NFI>0.9
Value-added fit index IFI	The closer the value is to 1, the better the applicability of the model. In general, IFI>0.9

According to the path coefficient obtained above, the weight of each index can be obtained after normalization, and the weight w of each index is calculated as:

$$w_{\gamma k} = \frac{\gamma_i}{\sum\limits_{i=1}^{3} \gamma_i} \qquad w_\lambda = \frac{\lambda_j}{\sum\limits_{j=1}^{l} \lambda_j} \times w_{\gamma k} \qquad (2)$$

Where $w_{\gamma k}$ is the weight coefficient of service environment quality, service interaction quality and service result quality; w_λ is the weight coefficient of 13 evaluation indexes, including guarantee of system perfection and market order stability; l refers to the number of evaluation indexes contained in three levels: service environment quality, service interaction quality and service result quality.

B. Evaluation Model Construction

1) Evaluation process

In order to clarify the scoring criteria in the survey process, the quantitative interval of each survey indicator is divided into five levels according to Table 3, and then the classic domain and the node domain are formulated according to the evaluation content. Secondly, a matter-element matrix is constructed to calculate the correlation coefficient according to the factors corresponding to the evaluation indexes. Thirdly, the degree to which the selected evaluation indexes are consistent with each evaluation grade is tested by determining the comprehensive correlation degree, and finally the evaluation result of the service quality of car-hailing is obtained. The evaluation process is shown in Fig. 3.

TABLE III. SURVEY INDICATOR INTERVAL DIVISION

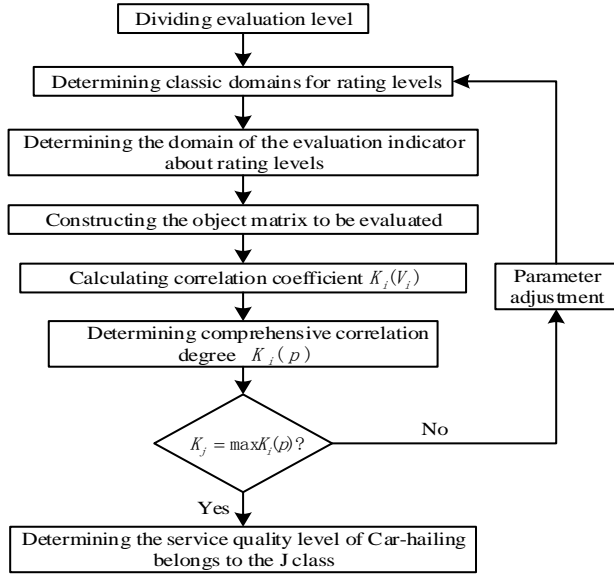| Rating level	Assessment level	Score interval
Level 1	Very satisfied	[90，100]
Level 2	More satisfied	[80，90)
Level 3	General	[70，80)
Level 4	Not satisfied with	[60，70)
Level 5	Very dissatisfied	[0，60)

FIGURE III. MATTER ELEMENT EXTENSION EVALUATION FLOW CHART

2) Determining the Classic Domain and the Node Domain

According to the evaluation indexes of car-hailing service quality, the 13 evaluation indexes, such as guarantee mechanism perfection and market order stability, are represented by C_1, C_2, …, C_{13}, which are taken as the basis. The evaluation grade can be divided into five grades according to Table 3 by referring to the numerical interval of the survey indexes in the data survey. The matrix of "classical domain" is constructed as follows:

$$R_i = \begin{bmatrix} N_i & C_1 & v_{i1} \\ & C_2 & v_{i2} \\ & \vdots & \vdots \\ & C_{13} & v_{i13} \end{bmatrix} = \begin{bmatrix} N_i & C_1 & [a_{i1}, b_{i1}] \\ & C_2 & [a_{i2}, b_{i2}] \\ & \vdots & \vdots \\ & C_{13} & [a_{i13}, b_{i13}] \end{bmatrix} \quad (3)$$

Where R_i is the comprehensive evaluation matter element model of the service quality of the i -the car-hailing; N_i is the service quality evaluation index of the i -th network; and $v_{ik} = [a_{ik}, b_{ik}]$ ($k = 1, 2, \cdots, 13$) is the value range of the k-th evaluation index of the service quality of the i -th network.

The way to construct the node domain is to respond to the basic characteristics of the service quality evaluation index of car-hailing and its corresponding magnitude value in the form of matrix. The domain matter element matrix is recorded as R_p :

$$R_p = (N_p, C, V_p) = \begin{bmatrix} N_p & C_1 & v_{p1} \\ & C_2 & v_{p2} \\ & \vdots & \vdots \\ & C_{13} & v_{p13} \end{bmatrix} = \begin{bmatrix} N_p & C_1 & [a_{p1}, b_{p1}] \\ & C_2 & [a_{p2}, b_{p2}] \\ & \vdots & \vdots \\ & C_{13} & [a_{p13}, b_{p13}] \end{bmatrix} \quad (4)$$

Where R_p is the matter-element within the allowable value range of the comprehensive evaluation index of car-hailing service quality; N_p is the grade of car-hailing service quality; $v_{pk} = [a_{pk}, b_{pk}]$ is the value range of different levels of car-hailing service quality.

3) Building assessment matter-element matrix

The evaluation indexes of car-hailing service quality are sorted out, and the matrix is used to react. The matrix is defined as the matter-element matrix to be evaluated, denoting as R_0 :

$$R_0 = (P_0, C, V) = \begin{bmatrix} P_0 & C_1 & v_1 \\ & C_2 & v_2 \\ & \vdots & \vdots \\ & C_{13} & v_{13} \end{bmatrix} \quad (5)$$

Where P_0 is the matter element to be evaluated, that is the comprehensive evaluation of car-hailing service quality; v_k is the value of the k -th car-hailing service quality evaluation index.

4) Calculating the correlation coefficient

According to the calculation of correlation function, the evaluation level of car-hailing service quality is:

$$K_i(v_i) = \begin{cases} -\dfrac{P(v_i, v_{ij})}{|v_{ij}|} & v_i \in v_{ij} \\ \dfrac{P(v_i, v_{ij})}{P(v_i, v_{pj}) - P(v_i, v_{ij})} & v_i \notin v_{ij} \boxplus P(v_i, v_{ij}) \neq 0 \\ -P(v_i, v_{ij}) - 1 & v_i \notin v_{ij} \boxplus P(v_i, v_{ij}) = 0 \end{cases} \quad (6)$$

Where the values of $|v_{ij}|$, $p(v_i, v_{ij})$, and $p(v_i, v_{pj})$ are:

$$|v_{ij}| = |b_{ij} - a_{ij}| \quad (7)$$

$$P(v_i, v_{ij}) = \left| v_i - \frac{1}{2}(a_{ij} + b_{ij}) \right| - \frac{1}{2}(b_{ij} - a_{ij}) \quad (i = 1, 2, \cdots, n; j = 1, 2, \cdots, m) \quad (8)$$

$$P(v_i, v_{pj}) = \left| v_i - \frac{1}{2}(a_{pj} + b_{pj}) \right| - \frac{1}{2}(b_{pj} - a_{pj}) \quad (j = 1, 2, \cdots, m) \quad (9)$$

According to the calculation of correlation coefficient, the degree of correlation of car-hailing service quality belonging to a certain level can be obtained. When the calculation results are between [0,1], the rating results of car-hailing service quality

meet the requirements, and the larger the obtained value, the higher the membership of the car-hailing quality is.

5) Determining comprehensive correlation degree

Comprehensive correlation degree reflects the degree of correlation between the service quality of car-hailing and the evaluation grade, taking into account the weight coefficient. Its expression is:

$$K_i(p) = \sum_{i=1}^{n} w_i k_i(v_i) \qquad (j = 1, 2, \cdots, n)$$

(10)

Where $K_i(p)$ is the degree of association of the service quality of car-hailing with respect to the i-th level; w_i is the weight of the index obtained by the structural equation model

If Kj=maxKj(p)>0, then the assessed car-hailing service quality belongs to level j

If all j is Kj(p) ≤0, it indicates that the final evaluation result of car-hailing service quality is not in the determined evaluation grade and cannot meet the basic requirements of matter-element evaluation. Corresponding indexes should be improved and modified, and the evaluation grade should be determined by calculation again.

IV. CASE APPLICATION

A. Data collection and inspection

In 2016, the average daily travel volume of Chongqing's online car reached 228,000. The way of car-related travel has become an important way for Chongqing residents to travel. A random survey was conducted on the quality of Chongqing's car-hailing service using both online questionnaires and paper questionnaires. The distribution and recovery of the questionnaire are shown in Table 4.

TABLE IV. QUESTIONNAIRE RECYCLING STATISTICS

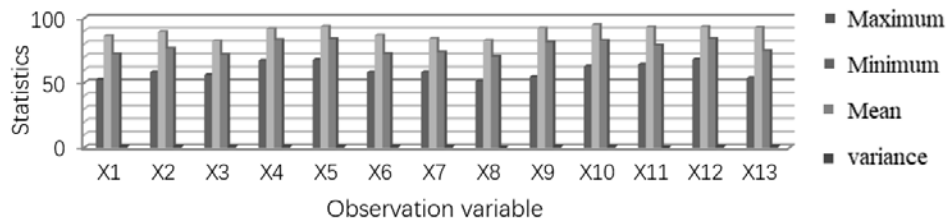| Distribution method	Number issued (parts)	Recycling quantity (parts)	Effective quantity (parts)	Recovery rate(%)	Efficient(%)
Online questionnaire	1500	1368	1224	91.2	81.6
Paper questionnaire	1000	892	837	89.2	8.7
Total amount	2500	2260	2061	90.4	82.4

FIGURE IV. VARIABLE DESCRIPTIVE STATISTICS

The results of using SPSS17.0 to analyze the effective questionnaire are shown in Figure 4. It can be seen that the respondents' responses have great differences, and the discrimination is good. The standard deviation of the measures is about 1, indicating that the survey is normally distributed.

B. Determination of Indicator Weight

Since the collected data has reached the validity and reliability requirements and conforms to the normal distribution, the maximum likelihood estimation method can be used to evaluate and analyze the service quality of car-hailing in Chongqing. Enter the data into car-hailing service quality evaluation index weight research model, the output data can be seen through the exponential model fitting software AMOS17.0 have reached the judgment criteria value (the data output by AMOS 17.0 shown in Table 5). Therefore, the overall fit of the model can be considered to meet the standard. Using the structural equation model analysis, the weight of the Chongqing car-hailing service quality evaluation index is as shown in Figure 5.

The results of using SPSS17.0 to analyze the effective questionnaire are shown in Figure 4. It can be seen that the respondents' responses have great differences, and the discrimination is good. The standard deviation of the measures is about 1, indicating that the survey is normally distributed.

TABLE V. PARTIAL FITTING INDEX OF STRUCTURAL EQUATION MODELING

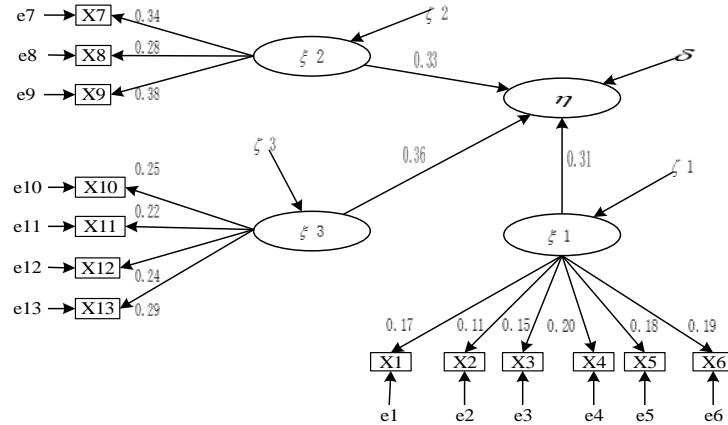| Fitting index	χ^2/df	CFI	IFI	GFI	NFI	RMSEA
Judging criteria	2-3	>0.9	>0.9	>0.9	>0.9	<0.05
Model index	2.18	0.92	0.96	0.93	0.94	0.038

FIGURE V. CHONGQING CAR-HAILING SERVICE QUALITY EVALUATION SYSTEM STRUCTURAL EQUATION PATH DIAGRAM

C. Comprehensive Analysis

1) Establishing classical domain and sectional matter matrix.

The 13 evaluation indicators are divided into five evaluation grades, and the classic domain matter matrix and of Chongqing city car-hailing service quality are constructed.

$$R_1 = \begin{bmatrix} N_1 & C_1 & [0,60) \\ \text{very dissatisfied} & C_2 & [0,60) \\ & \vdots & \vdots \\ & C_{13} & [0,60) \end{bmatrix}$$

$$R_2 = \begin{bmatrix} N_2 & C_1 & [60,70) \\ \text{dissatisfied} & C_2 & [60,70) \\ & \vdots & \vdots \\ & C_{13} & [60,70) \end{bmatrix} \quad R_3 = \begin{bmatrix} N_3 & C_1 & [70,80) \\ \text{normal} & C_2 & [70,80) \\ & \vdots & \vdots \\ & C_{13} & [70,80) \end{bmatrix}$$

$$R_4 = \begin{bmatrix} N_4 & C_1 & [80,90) \\ \text{satisfied} & C_2 & [80,90) \\ & \vdots & \vdots \\ & C_{13} & [80,90) \end{bmatrix} \quad R_5 = \begin{bmatrix} N_5 & C_1 & [90,100] \\ \text{very satisfied} & C_2 & [90,100] \\ & \vdots & \vdots \\ & C_{13} & [90,100] \end{bmatrix}$$

$$R_p = \begin{bmatrix} N_p & C_1 & [0,100] \\ & C_2 & [0,100] \\ & \vdots & \vdots \\ & C_{13} & [0,100] \end{bmatrix}$$

2) Constructing the object matrix to be evaluated

By collecting the data of Chongqing city car-hailing service quality evaluation indicators, the classical domain matter and for constructing the service quality of Chongqing car-hailing are as follows:

$$R_0 = \begin{bmatrix} N_0 & C_1 & 72.1 \\ & C_2 & 76.5 \\ & C_3 & 71.5 \\ & C_4 & 83.2 \\ & C_5 & 83.9 \\ & C_6 & 72.4 \\ & C_7 & 73.4 \\ & C_8 & 70.3 \\ & C_9 & 81.4 \\ & C_{10} & 82.7 \\ & C_{11} & 78.9 \\ & C_{12} & 84.1 \\ & C_{13} & 74.7 \end{bmatrix}$$

3) Calculating correlation coefficient

According to formula (8), the correlation coefficient of Chongqing's car-hailing service quality evaluation index on different levels is shown in Figure 6:
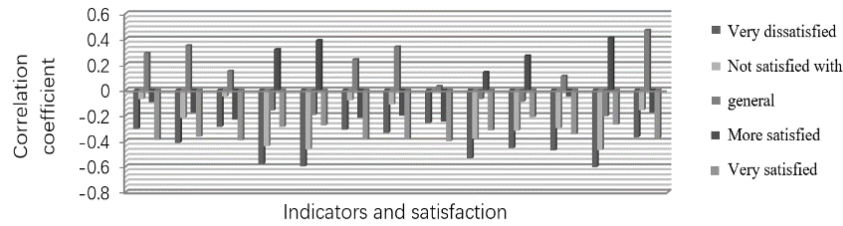
FIGURE VI. CORRELATIVE COEFFICIENT CALCULATION RESULT OF EACH INDEX ABOUT DIFFERENT EVALUATION LEVELS

4) Determining comprehensive correlation degree

According to formula (12), the comprehensive relevance degree of service environment quality, service interaction quality and service results of Chongqing's car-hailing service is shown in Figure 7-9:
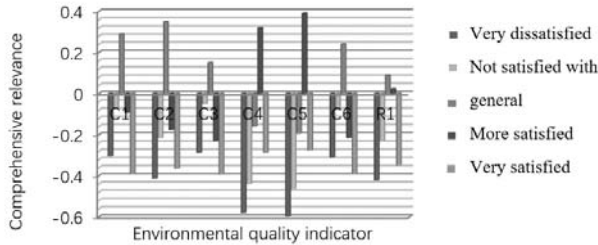

FIGURE VII. CAR-HAILING SERVICE ENVIRONMENTAL QUALITY COMPREHENSIVE RELEVANCE CALCULATION RESULTS
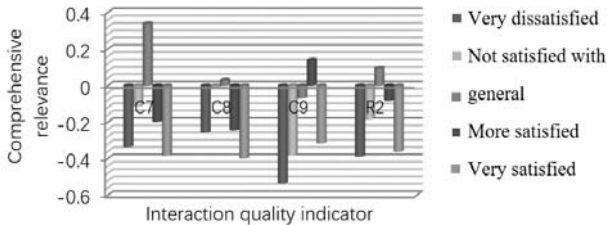

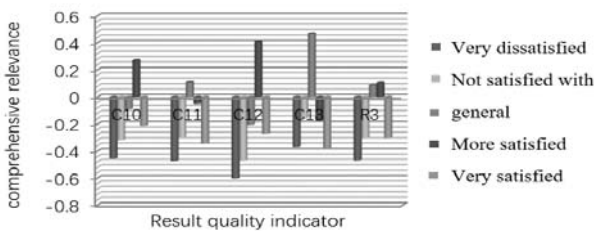FIGURE VIII. CAR-HAILING SERVICE INTERACTION QUALITY COMPREHENSIVE RELEVANCE CALCULATION RESULTS

FIGURE IX. CAR-HAILING SERVICE RESULT QUALITY COMPREHENSIVE RELEVANCE CALCULATION RESULTS

Therefore, the comprehensive correlation degree of Chongqing's car-hailing service quality is:

$$K_1 = 0.310 \times (-0.423) + 0.330 \times (-0.389) + 0.360 \times (-0.469) = -0.428$$

As the same reason, K2 =-0. 242; K3 =0.092; K4 =0.018; K5 =-0.335.

So, $K = \begin{cases} \textit{Very dissatisfied} & -0.428 \\ \textit{Not satisfied with} & -0.242 \\ \textit{General} & 0.092 \\ \textit{More satisfied} & 0.018 \\ \textit{Very satisfied} & -0.335 \end{cases}$

Due to the maximum value K3 =0.092, the quality of the car-hailing service in Chongqing is 'General', and measures need to be taken to improve it.

V. CONCLUSION

This paper selects three main dimensions of service environment quality, service interaction quality and service result quality and its corresponding 13 sub-dimensions, constructed a three-level evaluation index system, used the structural equation model to calculate the weight of each evaluation index, built a comprehensive evaluation model combined element extension theory. Through the evaluation of the quality of Chongqing's car-hailing service, it is considered that its service quality is general and needs to be further improved.

- The multi-dimensional and multi-level evaluation index system constructed is considered from the whole process of the car-hailing service, and the included index system can provide a certain basis for the evaluation of the service quality of the car-hailing.

- The index weight determination of the structural equation model is based on the analysis of the original data, and the path coefficient is determined on the basis of determining the relationship between the indicators, which avoids the influence of human subjective factors and the quality of the car-hailing service from the system level. The evaluation indicators are grasped to improve the reliability of the evaluation results.

- The established evaluation method can be applied to the evaluation of the service quality of the car-hailing. The evaluation result can reflect the quality of the car-hailing service and provide a basis for the improvement and improvement of the car-hailing service quality.

REFERENCES

[1] Yuefeng Chen. The Regulatory Structure of "Internet Plus": A Case Study on "App-Based Ride and Taxi Services" [J]. Jurists Review, 2017(01): 17-31+175-176.J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.

[2] Yikai Zhen. Research on New Policy of Ride-hailing Regulations[J]. China Industrial Economics, 2017(08):81-99.

[3] Joshua Paundra, Laurens Rook, Janvan Dalen, WolfgangKetter. Preferences for car sharing services: Effects of instrumental attributes and psychological ownership[J]. Journal of Environmental Psychology, 2017, 53:121-130..

[4] Gooi Sai Weng, Suhaiza Zailani, Mohammad Iranmanesh, Sunghyup SeanHyun. Mobile taxi booking application service's continuance usage intention by users[J]. Transportation Research Part D: Transport and Environment, 2017, 57:207-216.

[5] Mingshu Wang, Lan Mu. Spatial disparities of Uber accessibility: An exploratory analysis in Atlanta, USA[J]. Computers, Environment and Urban Systems, 2018(67):169-175.

[6] Jing Wang. Regulatory Quandary and its Solutions of Internet Chauffeured Carin China[J]. Administrative Law Review, 2016(02):49-59.

[7] Daozhi Zhao, Jie Yang. Price Regulation Strategy of Online Car-hailing Service Targeted at Fairness[J]. Control and Decision: 1-9[2018-05-07].https://doi.org/10.13195/j.kzyjc.2017.1541.

[8] Chang Ying. Research on the Pricing Mechanism of Taxi Transport Price in the Time of Internet Vehicle[J]. Price: Theory & Practice, 2016(10):98-101.

[9] Roland T. Rust, Richard L. Oliver. Service Quality: New Directions in Theory and Practice[J]. M.e.sharpe, 1994: 101-105.