Analysis of Influencing Factors on the Development of China's Sharing Cars Industry

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ABSTRACT. In today's era of shared economy, sharing cars conform to the development trend of the times, so governments of various countries have high hopes for their development. The sharing car borrowed and returned immediately not only facilitates people to travel flexibly, but also reduces exhaust emissions and improves the urban environment. It has won the support of the general public and has rapidly accumulated a deep mass base in our country. This paper analyses the influencing factors on the development of the sharing cars industry from three aspects, namely, supply, demand and government, and uses the form of questionnaire to integrate the influencing factors into the questionnaire topics for detailed research. On this basis, it puts forward targeted suggestions to provide certain theoretical reference for the healthy and rapid development of the sharing cars industry.

1. Development Status of Sharing Cars in China

1.1 Related Concepts of Sharing Cars

Shared car travel mode is an environment-friendly travel mode combining the Internet and cars. It originated in Germany and Switzerland and has been adopted by other European countries since then. Shared car service, in a broad sense, is the sharing of the right to use a car, which means that people can still use the travel mode of the car without the ownership of the car. In a narrow sense, it is a car rental activity in which users pay a certain deposit, take minutes or hours as the pricing unit, and use information technologies such as mobile Internet and global positioning to build a network service platform to carry out self-service vehicle reservation, vehicle return and fee settlement.

1.2 Development Status of Sharing Cars[1]

1.2. 1. The market scale has expanded significantly.
Compared with developed countries, China's sharing cars industry started relatively late, but its development is very rapid. With the innovation of the Internet, sharing cars has become one of the main representatives of the shared economy. Relevant government departments have increased their attention to the development of the sharing cars industry, and many automobile-related enterprises have continuously entered the industry. According to statistics, starting from 2017, the number of newly registered sharing car enterprises has gradually increased. As of June 2018, there are more than 400 registered sharing car enterprises in China, and the number of sharing cars put into operation has exceeded 100,000. In 2015, the size of China's sharing car market was only 52 million yuan, and by 2017, the size of China's sharing car market had increased to 1.729 billion yuan.

1.2. 2. The financing of the sharing cars industry is stable.
The sharing cars industry has always been a hot area for investors. According to statistics, China's auto travel industry completed 341 financing projects in 2018, with a total financing of 187.3 billion yuan. Among them, 84 enterprises in the field of science and technology travel (online car-hailing, sharing cars, etc.) have completed financing, accounting for 28% of the total number of enterprises, with a total financing amount of 74.8 billion yuan.

1.2. 3. The scale of users has grown steadily and the industry is on the rise.

Judging from the number of users of sharing car App, its user size and industry penetration rate are still growing steadily. According to the data, from November 2017 to November 2018, the number of users in China's sharing cars industry increased steadily from 3.89 million to 9.524 million, up 144.83% year on year. On the other hand, the industry penetration rate rose steadily from 0.39% in November 2017 to 0.87% in November 2018, up 0.48 percentage points. Therefore, the sharing car industry is on the rise.

1.3 Main Factors Influencing the Development of Sharing Cars

1.3. 1. Perspective of Supply:

On the one hand, the operating cost of sharing cars enterprises is relatively high, mainly including vehicle purchase fees, insurance premiums, maintenance fees, construction of related facilities, management and maintenance fees, etc. On the other hand, the income model of sharing cars enterprises is relatively single and it is difficult to make profits in the short term. If an enterprise cannot effectively control costs, improve operational efficiency and explore a reasonable profit model, it will not be able to survive in long-term competition [2].

1.3. 2. Perspective of Demand:

Consumers' perception of sharing cars will directly affect the choice of consumption behaviour. When the sharing cars industry arose, due to the limitation of traditional ideas, consumers' recognition was low and the market scale expanded slowly [3]. With the improvement of consumers' cognitive level, the number of users has also surged. Secondly, the quality of user experience is also an important factor that determines the sustainable development of the sharing cars industry. Every link from user registration to completion of lease must adhere to the principle of user-oriented design, with the aim of realizing users' multiple consumption and word-of-mouth effect.

1.3. 3. Perspective of Government:

With the expansion of the scale of the sharing cars industry, the shortage of public resources such as license plates, parking spaces and charging piles has become a bottleneck restricting the rapid development of the industry [4]. As the manager of public resources, the government's relevant policies and measures directly affect the development speed of the sharing cars industry. Sharing cars is a supplement to public transportation and is conducive to alleviating urban traffic problems. In recent years, many governments have gradually increased their support for the sharing cars industry and continuously created favourable conditions for its development.

2. Empirical Analysis of Influencing Factors on the Development of Sharing Cars

2.1 Questionnaire Design

As a green travel mode for sustainable development in the new era, sharing cars not only effectively slow down environmental pollution, but also meet the needs of different groups and promote the development of new energy sources. This paper designs a set of questionnaires on the development of sharing cars through consulting and drawing lessons from relevant literatures and combining the analysis of the above influencing factors. The influencing factors involved in the questionnaire mainly include users' own factors, travel characteristics, community influence, willingness to use, selection criteria, etc. Among them, the user's own factors include the user's gender and age, education level, current living city and occupation [5]. Travel characteristics are mainly the reasons and scenes for consumers to use sharing cars. Community influence refers to the channels through which users know how to share cars; Willingness to use refers to whether users are willing to use sharing cars and support the development of sharing cars. Selection criteria refer to which aspects users will choose according to the model, brand, price, etc. of the sharing car. Finally, we also designed a topic about measures to solve some obvious problems in the current sharing car market,

so as to put forward more accurate suggestions for the development of sharing cars through the choice of users.

2.2 Collection of Questionnaire Data

The questionnaire is mainly divided into two parts: The first part is personal basic information, and the second part is the current situation and influencing factors of sharing cars. This survey data uses the questionnaire star web page to make the questionnaire, mainly through the form of the network, using social platforms such as Moments and QQ groups to distribute the questionnaire, which is convenient to investigate users in different regions of the country. The questionnaire was distributed to people we know first, and then more answers from strangers were collected through their help and spread, thus ensuring the authenticity of the questionnaire results to a certain extent. A total of 385 questionnaires were collected in this survey, of which 57 were invalid and 328 were valid, with a recovery rate of 85.2%.

2.3 Data Analysis

2.3. 1. Reliability and Validity Analysis
Before factor analysis, the reliability and validity of the questionnaire were tested by SPSS software.
2.3. 1.1. Reliability Test

Table 1 Reliability Analysis

Cronbach's alpha	Number of items
.828	100

The coefficient of overall reliability is greater than 0.8, which is more in line with the conditions. The reliability of the questionnaire is within a good range, and the measurement results are relatively reliable.

Table 2 KMO and Bartlett's Spherical Test

Sampling suitability was measured by Kaiser-Meyer-Olkin.		.662
Bartlett's Spherical Test	Approximately chi-square	1248.957
	df	120
	Significance	.000

In order to make factor analysis on the influencing factors of sharing cars, it is necessary to judge the scope of application. Only when KMO value is greater than 0.6 and Bartlett's Spherical Test rejects the original hypothesis can further factor analysis be performed on the data. In the data analysis of the questionnaire, KMO value is 0.662, chi-square value is 1248.957 and the significance P value is 0.000 in Bartlett's Sphericity Test. Among them, the significance P value less than 0.001 means rejecting the original hypothesis, which is suitable for factor analysis.
2.3. 2. Factor Analysis

Table 3: We extracted five factors

Assembly	Initial eigenvalue			Extract sum of squares load		
	Total	Variation %	Accumulated %	Total	variation%	Accumulated%
1	2.917	18.234	18.234	2.917	18.234	18.234
2	2.284	14.273	32.506	2.284	14.273	32.506
3	1.890	11.811	44.317	1.890	11.811	44.317
4	1.601	10.006	54.323	1.601	10.006	54.323
5	1.091	6.819	61.142	1.091	6.819	61.142
6	.959	5.992	67.133			
7	.800	5.000	72.134			
8	.742	4.638	76.771			

9	.648	4.053	80.824			
10	.618	3.861	84.685			
11	.543	3.394	88.079			
12	.462	2.890	90.968			

It is generally believed that the cumulative variance of each factor exceeds 60%, which indicates that the structural validity of the questionnaire is relatively good. As can be seen from Table 3, the contribution rate of cumulative variance in the factor analysis of the questionnaire is 61.142%, indicating that the validity of the questionnaire structure in this paper is good, and the five common factors extracted have ideal explanations for the original variables. On this basis, principal component analysis is carried out.

Table 4 Component Scoring Coefficient Matrix

	Composition				
	1	2	3	4	5
SMEAN(@7 Family or friends)	.300	.035	-.023	.022	.128
SMEAN(@9Near tourist attractions)	.093	.112	.074	.416	-.159
SMEAN(@10Go shopping)	.311	.008	-.055	.038	.030
SMEAN(@10 Personal affairs and entertainment)	.010	.326	.112	.043	-.248
SMEAN(@11 No driver's license)	.058	.031	.309	-.041	.188
SMEAN(@12 The brand and model of the car)	.322	.009	.066	-.008	-.033
SMEAN(@12 Flexibility to borrow and return cars)	.055	.423	-.036	.074	.050
SMEAN(@12 Safety and insurance)	.032	-.017	.346	-.006	.220
SMEAN(@15 Convenient and fast, and high travel flexibility)	.000	.034	-.015	.435	-.008
SMEAN(@15 Promote the development of new production capacity)	-.008	-.003	.349	.010	-.157
SMEAN(@16 The deposit is too high and the cost is high)	.321	.037	.032	.037	-.021
SMEAN(@16 The network coverage is insufficient and it is inconvenient to borrow and return the car.)	-.004	.390	-.080	-.003	.125
SMEAN(@12 Prices and services)	-.016	-.032	-.116	.347	.132
SMEAN(@15 Saved car purchase and maintenance costs)	.019	.176	-.005	-.170	.497
SMEAN(@16 Charging piles, parking lots and other supporting facilities are not perfect.)	.008	-.114	-.062	.150	.549
SMEAN(@16 The phenomenon of being possessed by others is serious.)	-.041	-.019	.363	-.058	-.270

Let the variables in the above table (in order) be as follows: 17. Family or friends is X_1, 9. Near tourist attractions is X_2, ...16. The phenomenon of being occupied by others is serious is X_{16}.

$F1=0.300X_1+0.093X_2+0.311X_3+0.010X_4+0.058X_5+0.322X_6+0.055X_7+0.032X_8+0.000X_9-0.008X_{10}+0.321X_{11}-0.004X_{12}-0.016 X_{13}+0.019 X_{14}+0.008 X_{15}-0.041 X_{16}$

$F2=0.035X_1+0.112X_2+0.008X_3+0.326X_4+0.031X_5+0.009X_6+0.423X_7-0.017X_8+0.034X_9-0.003X_{10}+0.037X_{11}+0.390 X_{12}-0.032 X_{13}+0.176 X_{14}-0.114 X_{15}-0.019 X_{16}$

$F3=-0.023X_1+0.074X_2-0.055X_3+0.112X_4+0.309X_5+0.066X_6-0.036X_7+0.346 X_8-0.015 X_9+0.349 X_{10}+0.032 X_{11}-0.080X_{12}-0.116 X_{13}-0.005 X_{14}-0.062 X_{15}+0.363 X_{16}$

$F4=0.022X_1+0.416X_2+0.038X_3+0.043X_4-0.041X_5-0.008X_6+0.074 X_7-0.006 X_8+0.435 X_9+0.010 X_{10}+0.037 X_{11}-0.003 X_{12}+0.347 X_{13}-0.170 X_{14}+0.150 X_{15}-0.058 X_{16}$

$F5=0.128X_1-0.159X_2+0.030X_3-0.248X_4+0.188X_5-0.033X_6+0.050X_7+0.220X_8-0.008X_9-0.157X_{10}-0.021 X_{11}+0.125 X_{12}+0.132 X_{13}+0.497 X_{14}+0.549 X_{15}-0.270 X_{16}$

2.4. Conclusions

Through the above analysis of factors affecting the development of sharing cars, five common factors have been generated. F1 shows that the respondents care more about the brand model of the car when choosing to share the car, and the respondents generally think that the deposit and cost of sharing the car are high. F2 shows that the respondents attach great importance to the flexibility of returning cars to sharing car services and feel that insufficient network coverage is one of the current drawbacks. F3 shows that the respondents are relatively focused on the safety and insurance services of sharing cars, and they believe that the phenomenon of sharing cars being occupied by others is serious. F4 shows that the respondents believe that sharing cars is convenient, fast and flexible, so they are more willing to use sharing cars to travel. F5 shows that the respondents found that the sharing car lacked supporting facilities such as charging piles and parking lots. According to the analysis of the above five factors, the vehicle characteristics and supporting facilities and services of sharing cars are the main factors that affect users' selection behaviour.

3. Suggestions for countermeasures

3.1. Do a good job in the supervision of vehicle delivery, improve and maintain the construction of supporting facilities.

Shared car enterprises must do a good job of market research before launching vehicles on the market, reasonably plan out the number of sharing cars that should be launched and the outlets that should be launched, so that sharing car resources can be effectively utilized. In addition, enterprises should pay attention to timely recycling of broken and damaged sharing cars on the market, and properly maintain vehicles of good quality, so as to avoid users' dissatisfaction with their services when using sharing cars of poor quality[6].

3.2. Fully analyze customer demand preferences and provide high-quality services.

Shared car enterprises should analyze the demand characteristics of customers according to big data, choose brand models with high recognition to launch, flexibly formulate car rules, formulate personal credit standards for users, appropriately reduce or even exempt deposits for users with high credit, encourage users to travel in good faith, and create a good environment for sharing cars[7].

3.3. Accelerate technological innovation, improve efficiency and reduce operating costs.

Sharing cars is a high-tech barrier industry, involving many dimensions such as vehicle charging, vehicle safety, vehicle networking system, intelligent assisted driving and even unmanned driving. Technological breakthroughs are crucial to the improvement of vehicle sharing efficiency [8].

3.4. Formulate relevant policies to define powers and responsibilities and create a good legal environment.

The government management department should analyze the problems in the development process of the sharing cars industry to formulate corresponding industry policies, so that the sharing cars service has laws to follow, clearly divide the boundaries of responsibilities, and make the sharing cars market in a good development environment.

3.5. Build a public platform for sharing cars to improve market operation efficiency.

At present, the service platforms of all sharing cars enterprises are in an independent state. Users can only know the information of a sharing car company on a sharing car platform, which is difficult to promote large-scale operation. The government should cooperate with enterprises to jointly build a public sharing car service platform and integrate data resources so that users can directly learn about different service companies and operating vehicles on this platform.

4. Conclusion

Sharing cars have the characteristics of flexible travel and low price, which can effectively utilize idle vehicle resources, improve social travel efficiency and also help to improve environmental conditions. The development of China's sharing car industry is not yet mature, so the government still needs to establish relevant laws and policies to encourage and support the development. For enterprises, they should also do a good job in market research, find out the market positioning, continuously carry out scientific and technological innovation, and provide users with better services. For users, they should also strengthen their own quality education and cherish and protect Sharing cars. I believe that in the future, China's sharing car industry will definitely develop continuously and rapidly.

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