

Research on the B&B (Bed and Breakfast) Market Network Attention in China Based on Baidu Index

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Abstract: In recent years, B&B has been favored by tourists because it can provide tourists with various and interesting personalized life experiences. With the help of Baidu Index platform, this paper studies the spatial and temporal distribution, demand characteristics and media attention of B&B. It concludes that the population with B&B needs mainly concentrated in Jiangsu, Zhejiang, Guangdong, Sichuan, Beijing, Shanghai, and other places; Netizens' attention to B&B shows a seasonal fluctuation and obvious fluctuation trend in off-season and peak season, the main B&B they care about are located in Japan, Taiwan Kenting, Sanya, and Beihai; The agritainment has become the main form of netizens' attention; The live broadcast platforms such as betta and tiger teeth, as well as the variety show of B&B, have become an important channel for people to understand B&B; B&B development is about to enter a healthy and steady development stage from the unregulated rapid growth stage.

1. Introduction

As an emerging lodging industry, B&B is favored by the tourism market with its unique accommodation experience and cultural consumption characteristics [1]. The research on the B&B is also becoming more and more abundant, and the research methods and perspectives show a diversified trend. Based on the Baidu index platform, this paper studies the spatial and temporal distribution characteristics of the netizens' attention to the B&B, the demand characteristics of the B&B and the media attention characteristics, and analyzes and predicts the development of the Chinese B&B market in the future. Through research, the author hopes to provide methods and reference for the development of the Chinese B&B market.

The Baidu Index is a data-sharing platform based on Baidu's massive netizen behavior data. It is one of the most important statistical analysis platforms in the current Internet and even the entire data age. Although the relevant data generated by Baidu Index may be inaccurate due to the retrieval sampling and approximation algorithm, the trend results in Baidu Index are scientifically based, therefore, as an important tool for data acquisition, Baidu Index is of great help for analysis and researches some Issues in related fields [2]. This paper mainly uses three analysis functions of Baidu Index: trend study, demand map and crowd portrait to study the netizens' attention to the B&B.

2. Spatial and temporal distribution characteristics of B&B attention

2.1 Temporal distribution characteristics of B&B attention between 2015 and 2018

The author will analyze the temporal distribution characteristics of Chinese netizens' attention to B&B from two aspects: the temporal distribution trend and the seasonal concentration index.

2.1.1 Temporal distribution trend of B&B attention

Enter the keyword "B&B" in the search bar of Baidu Index Platform. According to the trend map provided by Baidu Platform, the time is set between January 1, 2015, and December 14, 2018, and the search scope is set on PC + mobile, so that we can get the trend map of netizens' attention to

B&B based on Baidu Weekly Average Index (Figure 1). The main features are as follows.

From the overall trend, the netizens’ attention to B&B in the four years is increasing year by year, and it shows a more obvious fluctuation trend. In the past four years, there were 11 peaks of the weekly average index, which all quickly fell back to the bottom after reaching the peak level. The attention in 2015 was relatively low, there were only two small increases in January and March (Table 1), the weekly averages were 363 and 439 respectively, and then stabilized, while large fluctuations occurred between 2016 and 2018. In 2016, there were four peaks of the weekly average index, which were in January, February, August, and September (Table 1), the index exceeded 1000, the highest value appeared in August, and reached a sharp drop after 3896. After 2832 at the end of August, there was another rebound, the weekly average index rose again, from September 26 to October 2, the fourth peak was 3833, and then the peak dropped sharply until it reached 2000 and remained stable. In 2017, there were two peaks in the weekly average index, which were March and July (Table 1), and the weekly average index in July reached 6207, which was at a higher level. In 2018, there were three peaks of the weekly average index (Table 1), which occurred in April, July, and September, respectively. The weekly average from April 9 to April 15 reached the highest value of 6917 in four years, then fell sharply to 4039 in early June, and gradually recovered. In mid-July, there was a second peak of 6070 and then fell to 324 at the end of August. It reached its third peak of 4791 from September 24 to September 30 and finally fell back to 2886 at the end of October.

Netizens’ attention to B&B shows more obvious seasonal characteristics and “holiday” phenomenon. From March to April in spring, July to September is summer, and in early autumn, netizens pay most attention to B&B. Relatively speaking, from October to February of the second year, netizens pay less attention to B&B in autumn and winter, which has obvious differences between off-season and peak season. The peak season includes pre-Ching Ming Festival, summer vacation and pre-National Day, during which netizens have the strongest demand for B&B. At the end of September 2016 and 2018, there was a peak of netizens’ attention to B&B. After entering the National Day, netizens’ attention to B&B quickly fell back, this change showed a typical “pre-holiday omen” phenomenon [3].

Based on the above analysis of the Baidu Index, it can be seen that Chinese netizens’ attention to B&B has gone through the process from “cold” to “hot” and from “low” to “high”, while showing obvious seasonal fluctuations and “holiday fever”, it is speculated that Chinese consumers’ demand for B&B is relatively strong in spring, summer and early autumn, and this demand characteristic is inseparable from the holiday economy [4].

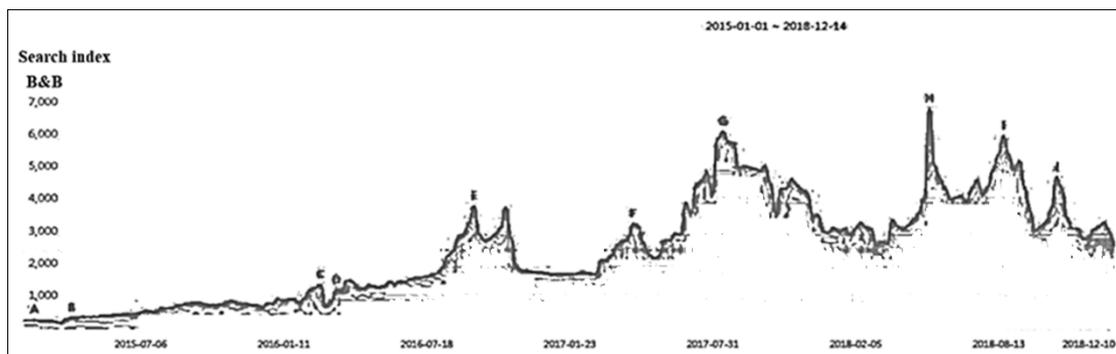


Figure 1 Temporal Distribution Trend of netizens’ Attention to B&B in 2015-2018

Table 1 Weekly Peak Distribution of netizens' Attention to B&B in 2015-2018

Time	2015		2016				2017		2018		
	1.12-1.18	3.2-3.8	1.25-1.31	2.15-2.21	8.15-8.21	9.26-10.2	3.13-3.19	7.10-7.16	4.9-4.15	7.16-7.22	9.24-9.30
Baidu Index Weekly Mean	363	439	1457	1282	3896	3833	3334	6207	6917	6070	4791

2.1.2 B&B seasonal concentration index

The seasonal concentration index, also known as the seasonal temporal intensity index, can quantitatively analyze the seasonal concentration of tourism network attention [5]. The calculation formula is:

$$R = \sqrt{\frac{\sum_{i=1}^{12} (x_i - 8.33)^2}{12}}$$

In the formula, “R” represents the seasonal intensity index, and “Xi” represents the proportion of the monthly attention of the network to the total number of attention throughout the year. The larger the index value, the higher the seasonal concentration of the network attention, and the greater the seasonal difference. On the contrary, the index value is closer to 0, indicating that the seasonal concentration of attention is lower, and the seasonal distribution is more uniform. Based on the Baidu Monthly Search Index data for the three years from 2015 to 2017 (Table 2), the seasonal concentration index for calculating the attention of the B&B by means of EXCEL software is: R-value of 8.246714421 in 2015, R-value of 8.246742202 in 2016 and R-value of 8.246710769 in 2017, which indicates that the netizens' attention level in 2015 to 2017 is higher and Seasonal variability is great. This conclusion is consistent with the obvious fluctuations in the trend of the previous Baidu index.

Table 2 Baidu monthly search index in 2015-2017

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
2015	10774	9254	13903	14666	16777	18973	23663	27305	25657	27119	25200	30406
2016	16172	32219	45019	43037	48522	51464	91639	101342	94172	70839	54963	55618
2017	57090	67475	94353	74530	100683	136008	181244	157755	134480	139530	106447	96928

2.2 The spatial distribution characteristics of netizens' attention to B&B in 2015-2018

According to the geographical distribution map and geographic concentration index in the Baidu index crowd image, the author analyzes the spatial distribution characteristics of netizens' attention to B&B.

2.2.1 Geographical distribution trend of netizens' attention to B&B

The geographical distribution in the Baidu Index mainly indicates the regions from which the users of the B&B come from. The algorithm is based on Baidu user search data, using data mining methods, clustering analysis attributes of the keywords, and then giving the distribution and ranking of the provinces, cities, and cities at which the users belong.

Enter the “B&B” keyword in the Baidu index field, and then set the time in the geographical distribution column from January 1, 2015, to December 14, 2018. The results show that the provinces and cities where the netizens are concerned are listed. The top 10 provinces and cities are Zhejiang, Guangdong, Sichuan, Jiangsu, Beijing, Shanghai, Shandong, Henan, Chongqing, and Hubei. This shows that netizens in the eastern, southwest, northern, and southeastern coastal areas of China are most concerned about the B&B. Most of these areas are economically developed provinces and cities (Figure 2).

According to B&B Market Development Report in 2016, the main force of the B&B is from

Jiangsu Province, Zhejiang Province, and Shanghai, and the customer source accounts for 78.56%, which is consistent with the search results of the area where the B&B is concerned. It shows that netizens in Chinese economically developed regions have higher recognition and acceptance to B&B, and these areas with high attention to B&B may also become the mainstay of B&B consumption.

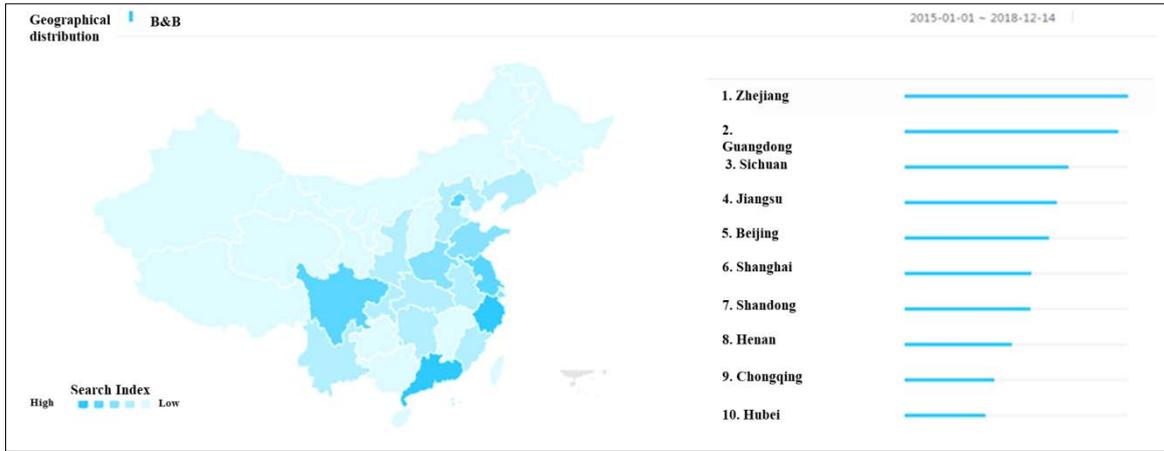


Figure 2 Regional Distribution Trends of netizens' Attention to B&B in 2015-2018

2.2.2 B&B attention degree geographic concentration index

The geographic concentration index is an important indicator to measure the geographic concentration of the search population related to network attention. It can be used to analyze the spatial distribution characteristics of network attention. The calculation formula is:

$$G = 100 \times \sqrt{\sum_{i=1}^n \left(\frac{X_i}{T} \right)^2}$$

In the formula, “Xi” represents the network attention of the i-th province, “T” represents the total number of national network attention, “n” represents the total number of provinces, and the theoretical value range of G is (0,100). The smaller the G value, the more dispersed the spatial distribution of network attention. The larger the G value, the more concentrated the spatial distribution of network attention [6].

According to the data of Baidu search index of ten provinces and cities in the three years from 2015 to 2017 (Table 3), the author calculated the geographical concentration index of the B&B attention by means of EXCEL software, which is the G value of 33.71725516 in 2015, the G value of 33.25878517 in 2016, the G value is 32.25305501 in 2017. The results show that the distribution of the top 10 B&B populations is more and more dispersed. Combined with the trend of the search index of these provinces and cities in the past three years, the regional differences in the attention of ten provinces and cities will gradually shrink. The netizens' understanding and attention to the B&B will be consistent.

Table 3 Baidu Search Index of Ten Provinces and Cities from 2015 to 2017

Year	Guang dong	Zhe Jiang	Si Chuan	Bei jing	Jiang su	Shan dong	Henan	Shang hai	Hubei	Chong qing
2015	66865	85955	41929	52582	51344	38426	31257	59510	36517	21054
2016	127813	167168	125542	96617	95267	76356	65755	103836	67783	60144
2017	223817	216993	198128	164465	174945	165096	154765	153275	108366	134318

3. Characteristic of netizens' B&B demand map

The demand map, also called demand distribution, provides information about the keywords and relevance of the keywords. Relevant words can help the public to understand the focus of netizens, and the demand map can also find the top 10 source-related words and destination-related words.

Source-related words refer to the words searched by netizens before searching for keywords, and destination-related words refer to the words searched by netizens after searching for keywords [7]. Search for “B&B” on the Baidu Index Demand Map page. By adjusting the time axis below the map, we can see the map of the demand for the B&B, the top 10 distribution of source-related words and destination-related words from January to December 2018.

According to the difference in the relevance of the search terms in the demand map, after the words with weaker relevance are removed, the related words of the B&B are obtained from January to mid-December 2018. We can find the characteristics of netizens’ attention before and after searching for “B&B” (Tables 4 and 5).

The age of the people concerned about B&B is mainly 30-49 years old, middle-aged people with strong economic ability, while the areas concerned are concentrated in Japan, Taiwan Kenting, Sanya, Beihai and other mature areas of B&B or seaside resorts.

Due to its geographical advantages, Japan and Taiwan Kenting have always been the main overseas tourist destinations for Chinese tourists. Especially in Taiwan, Kenting is popular among mainland tourists for its warm climate, charming scenery and diverse style of B&B. Sanya and Beihai are well-known seaside resorts in mainland China. The search time of netizens mainly occurs in January, November, and December of winter. During this period, netizens have more demand for B&B.

3.1 The live interactive platform such as betta and tiger teeth are concerned by netizens

Many homeowners put their B&B on the live interactive platform to get more fans’ attention, which makes the online live interactive platform become another channel for the public to understand the B&B.

3.2 B&B reality show variety show arouses netizens’ interest and concern about B&B

As a Korean reality TV show, “Xiaoli’s B&B” has also been popular with Chinese audiences. Since the second season was broadcasted on February 2018, the search for source-related words and destination-related words of B&B also showed a search fever in February-March. It can be seen that the Korean reality TV show has a great influence on netizens.

3.3 The words “folk custom”, “agritainment”, “B&B design” and “world cup” have become the hot search terms before and after the “B&B” search in 2018

The search index of these words reflects the netizens’ cultural needs for the B&B. The most special experience of staying at the B&B is to experience the local folk customs, which is also an important part of the future B&B tourism; Agritainment is the primary form of the development of Chinese B&B. It is also the most popular form of B&B. The netizens’ current focus on Agritainment is on eating. The most searched area is the Agritainment in Beihai in December. The emergence of the term “B&B design” not only indicates that netizens have a certain demand for B&B management but also indicates that netizens gradually attach importance to the construction of the internal and external environment of B&B. Meanwhile, major international competitions also have a great impact on the search before and after “B&B “. The word “World Cup” was searched frequently by netizens during the Russian Football World Cup on June 2018. According to Baidu’s query, many Chinese B&B owners promoted their B&B in the name of “World Cup”. They put forward the slogan of “Living in the B&B and watching the World Cup”. Even a fan spent 13,000 yuan to stay in the theme B&B for one month to watch the World Cup match. According to the ant short-term rental network data, during the World Cup, the number of bookings for the theme B&B reached 5,000 on the Ant Short-Term Rental Network.

Table 4 Source-related words and destination-related words in B&B search from January to June 2018

Time	1.08-1.14	2.12-2.18	3.12-3.18	4.09-4.15	5.07-5.13	6.11-6.17
Source-related words	Japan, Sanya, Baidu	Xiaoli's B&B, Xiaoli Home B&B 2	Xiaoli's B&B, Xiaoli's B&B 2, Folk, B&B website	Baidu, Folk, Betta, Xiaoli's B&B	Baidu, Betta, Tiger, Tencent	Folklore, World Cup, Baidu, Betta
Destination-related	Japan, Sanya, Taiwan, B&B Baidu	Xiaoli's B&B Season 2, Xiaoli's B&B	Xiaoli's B&B Season 2, Xiaoli's B&B, Betta fish, Taiwan B&B, B&B design	Taiwan B&B, Betta Fish, Kenting B&B, Kenting, Taiwan, B&B Design	Taiwan B&B, Betta Fish, Kenting, Tiger Tooth, Baidu, Kenting B&B, Taiwan	World, Betta, World Cup, Taiwan B&B

Table 5 Source-related words and destination-related words in B&B search from July to December 2018

Time	7.09-7.15	8.06-8.12	9.10-9.16	10.08-10.14	11.12-11.18	12.10-12.16
Source-related words	Baidu, fighting fish, tiger teeth, folk customs	Folk, Betta, B&B website	Betta, B&B website, folklore, tiger teeth	B&B website, folklore, betta, tiger teeth	B&B website, Betta fish, Beihai	Beihai, Betta, reservation, Beihai B&B reservation
Destination-related	Betta, Taiwan B&B, Tiger Tooth, Mogan	Betta, Tiger, Mogan, Taiwan B&B	Betta, Tiger Tooth, Taiwan B&B	Betta fish, tiger teeth, Taiwan B&B, B&B design	Beihai, Taiwan B&B, Betta Fish, Kenting, Kenting B&B	Beihai, farmhouse, food and shelter, Beihai farmhouse, food, and beverage, fighting fish, Taiwan B&B

4. B&B media index trend analysis

The so-called media index refers to the number of keywords related to the news reported by the major Internet media and is included in the Baidu news channel. The statistical standard adopted is that the news title contains keywords. Through the media index trend chart (Figure 3), combined with the news content during the peak hours, we can see the B&B hot news that the media pays attention to in different periods, to speculate and predict the development status and trend of the Chinese B&B industry.

4.1 The highest media coverage in China is Taiwan and Zhejiang about the B&B

From January 2015 to February 2018, there were 17 regional news items in the 25 news related to the B&B, including 5 news in Zhejiang and 3 news in Taiwan. It can be seen that the areas with high media attention are the areas where the development of B&B is earlier and more mature.

The topics of media concern are from the rapid development of B&B and the reference of B&B experience, to the problems arising in the development of B&B, until the introduction of B&B standards, which indicates that the development of B&B in China will enter a stable development stage from the initial stage of rapid growth without supervision.

From the content point of view, the focus of the B&B news in 2015 is in Taiwan. For example, the number of B&B in Pingtung, Taiwan increased; Chinese tourists get help from locals after they lost near the B&B where they lived in Taiwan. Chinese B&B industry draws on the development experience of B&B in Taiwan; B&B development in Taiwan is very prosperous; Korean Star Invests in B&B has been successful. These news reports have had a positive impact on Chinese people investing in B&B, during this period, there were many positive reports about B&B. B&B news was mainly based on positive reports, and Zhejiang Province became a news hotspot in 2016. From thousands of people in Hangzhou becoming landlords of B&B to the convening of Tonglu B&B Forum in Zhejiang Province and the keynote speeches of experts, the image of Zhejiang B&B

has been greatly improved, which also shows that Zhejiang B&B is in the leading position in China. The development of rural B&B in Yunnan and characteristic B&B in Sichuan Tibetan areas shows that the more local cultural characteristics the B&B are, the more popular they are.

The Chinese and American B&B booking platforms competed fiercely for Chinese customers. In 2016, indicating that the demand for B&B in China is huge, but the problems behind the rapid development of the B&B industry have followed, such as the legal operation of the surrounding B&B of Shanghai Disneyland indicates that contradictions in the development of the B&B have emerged.

From 2017 to the beginning of 2018, the B&B news can be summarized by the words “license”, “regulation” and “standard”, indicating that there are many problems in the development of B&B in this year. National and local governments have introduced standards and regulatory policies to ensure the legitimacy and healthy development of the B&B industry. At the same time, there were news reports that occupancy rate of B&B in China has declined in 2017, the main reasons are that the rapid development of B&B has led to an increase in the supply of B&B market, intensified competition and increased cost of B&B renovation, which indicates that the development of B&B in developed areas of China will enter a “calm period”.

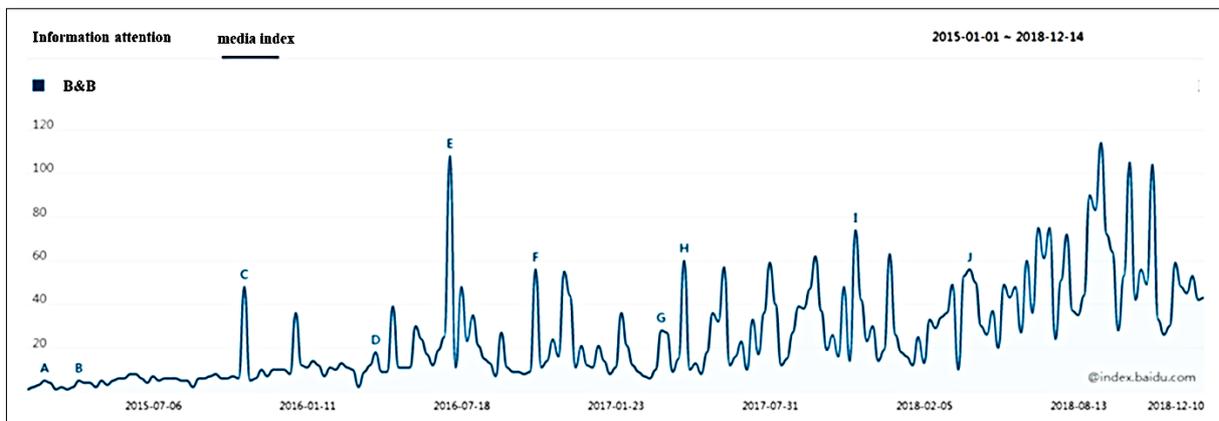


Figure 3 The trend of B&B media index from January 2015 to December 2018

5. Conclusions and suggestions

5.1 Conclusions

(1) According to the analysis of Baidu Index above, the B&B market is mainly concentrated in the middle-aged population aged 30-49, and Jiangsu, Zhejiang, Guangdong, Sichuan, Beijing, and Shanghai are the main B&B source of origin. The B&B attention shows obvious fluctuation trend in off-season and peak season, which indicates that the peak season of B&B tourism in China occurs during the holidays from March to October with high attention.

(2) The destinations with higher attention are mainly in Japan, Taiwan Kenting, Sanya, Beihai, such as seaside resorts with mature domestic and foreign B&B industry or better climate resources. These areas will become hot spots for Chinese people to choose from. In particular, Beihai may become a hotspot for B&B in 2019.

(3) Agritainment is still the most popular form of B&B, and the design of the B&B is gradually valued by the B&B owners. The live broadcast platforms such as betta and tiger teeth, as well as the variety show of the B&B, have become an important channel for people to understand the B&B.

(4) The B&B owners use the major international events to promote the B&B to make it more distinctive and individual, which has become a means of marketing.

(5) With the increase of operation risk and transformation cost, as well as the intensification of competition in B&B market, the management of B&B owners are forced to return to rationality, which also indicates that Chinese B&B industry will move towards a healthy and standardized development track.

5.2 Suggestions

(1) As a B&B owner, it is necessary to abide by the industry-issued B&B policies and standards, conduct legal business and rational investment, and use diversified network marketing methods and advanced management methods to operate according to the spatial and temporal distribution characteristics and demand characteristics of the B&B attention.

(2) The B&B owners should be good at learning from the valuable experience of the development of B&B industry in developed areas at home and abroad, discover new problems and new needs of B&B, and formulate industry policies in time to protect the healthy development of B&B industry in China.

6. Insufficiency and prospect of research

In this paper, Baidu Index is used to study netizens' B&B concern, which provides a new perspective and research means for the prediction of the spatial and temporal distribution characteristics and demand characteristics of B&B development in China, so it has certain value and significance. However, due to the lack of detailed data on the actual situation of the B&B visitors, the relationship between the B&B attention and the actual visit rate of the B&B isn't established. Therefore, the research results have certain limitations for the forecast of the B&B market, but also provide the direction for the author's next research.

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References

- [1] Jiang Jia-qian, Li Yan. A review of the international and domestic researches on Minshuku. *Tourism Research*, 2014, (4): 16-22.
- [2] Li Xia, Qu Hong-Jian. Spatial-temporal Characteristics and Influential Factors of Network Attention to Cruise Tourism: Based on Baidu Index. *Forum on Statistics and Information*, 2016, 31(4): 101-106.
- [3] Dong Yin-yin. Spatial and Temporal Characteristics of Network Attention in Grotto Scenic Spots Based on Baidu Index: A Case Study of Three Grottoes. *Journal of Henan University of Animal Husbandry and Economy*, 2017, 30(162): 10-15.
- [4] Yan Guo-Xiang. The Development of Consumer Behavior Theory. *Inquiry into Economic Issues*, 2008, (04): 31-36.
- [5] Pan Ying-Ying. Feasibility Analysis of Residence Development in Zhejiang Province-Taking Hangzhou as an Example. *Manager*, 2013, (11): 25.
- [6] Zhuang Zhi-Yi. On a Study of the audiences visiting Selection of the museum in Shanghai-based on Baidu Index. *Studies on Science Popularization*, 2016, 63(4): 63-68.
- [7] Pilates Mohtar, Ilias Gallatin. Spatial and Temporal Characteristics of Network Attention in Xinjiang Tourism Scenic Spots: An Analysis Based on Baidu Index. *Heilongjiang National Series*, 2016, 151(2): 81-85.