

Visualization Analysis of Visitors of Five-Star Hotels Based on Python Reptile Technology - Taking Nanjing as an Example

Zongsheng Yang

E-mail: 1392831574@qq.com

Guilin University of Technology

Abstract. Using the advantages of user-generated reviews, the Python crawler technology was used to obtain 7789 valid user-generated reviews of eleven five-star hotels in Nanjing from January 1, 2019 to December 31, 2021 from Ctrip website, and analyze the crawl data. The results show that the tourists pay more attention to the hotel room facilities, geographical location, surrounding environment and service quality, and think that the shortcomings of the hotel mainly include poor room sound insulation, part of the old hardware facilities, bad food taste and so on. On this basis, strategies and suggestions are put forward for the effective management and service optimization of the hotel, so as to provide scientific reference for the development and marketing of such star hotels.

Keywords: Five-star hotel; Review data; Visualization; Python crawler technology

1 Introduction

The rapid development of Internet technology has brought about a blowout growth of network data. It has become a difficult problem for many industries to process these massive data and study some useful information hidden behind these data. Along with our country entered the stage of rapid development of tourism industry, tourism industry is facing huge network travel data processing and mining problem, traditional data analysis methods have been unable to adapt to the new era of tourism demand data analysis, and based on data fetching the crawler technology and visualization technology is an effective data analysis methods, more and more industries use this technology to process and analyze the huge network data generated by the industry ^[1]. In recent years, with the rapid development of China's tourism industry, the application of Internet technology in the tourism industry has generated massive user information and tourist comment information. There are many difficulties in obtaining, processing, analyzing and visualizing tourist online comment data. The development of crawler technology provides an effective method for the analysis of tourists' online comments. The crawler technology can realize the acquisition, analysis and visualization of online tourists' comments data, thus providing important reference significance for the study of hotel development.

2 Python reptile technology and data source

Python is an interpretation, object-oriented, dynamic semantic, grammar, beautiful script language, since 1989, after more than ten years of development, it has become the most widely used cross-section. Platform scripting language^[2]. Where Python's natural language processing (NLP) is an important direction in the field of computer science and artificial intelligence. It studies the various theories and methods that can effectively communicate with natural language between people and computers^[3].

Ctrip Group is a world-leading one-stop travel platform, and the company's platform can provide a complete travel product, service and differentiated travel content for global users. Therefore, based on the platform, this platform is climbed and screens the online comments of Nanjing 11 five-star hotels in 2019 to 2021. Strip effective user evaluation.

3 Visitor comments content information data visualization

3.1 Word frequency analysis

Figure 1 is a data visualization diagram made by word cloud analysis method after the online review data of all five-star hotels in Nanjing from 2019 to 2021 are preprocessed by Using Python crawler technology, as shown in Figure 1. It is not difficult to see from Figure 1 that the graph shows the significance of key words in tourist comment data in different forms such as frequency, font and color. The larger the font and darker the color, the more tourists evaluate it, and the higher the evaluation frequency, indicating that tourists pay more attention to the content. Keywords and related words are searched in the text, and the words and sentences describing the keywords are summarized. The online review data of all five-star hotels in Nanjing from 2019 to 2021 are summarized and the contents of guest reviews under the keywords are highlighted as shown in Table 1. In conjunction with Figure 1 and T Table 1, it is clearly seen that the room facilities, service quality, food taste, surrounding environment, etc. are keywords with probability, in the visual manifestation of the word cloud visualization, and appear the word frequency is also high, and it is the focus of tourists who arrested in the vast tourists.



Figure 1 Data visualization diagram of information word cloud of guest comment content.

Table 1 Key words extraction of subject words.

Key Words and Sentences	Quantity
The room is good	1380
Warm and considerate service	1269
Fully equipped	980
Clean and tidy environment	967
Breakfast is rich	934
Sound insulation is poor	165
The food tastes bad	130
The toilet is leaking	95
No upgrades	86

3.2 Emotional analysis

SnowNLP is used for sentiment analysis in this paper. First, "readlines()" method is used to read all lines of text. Finally, matplotlib is used for visualization, and the function "np.arange ()" is used to set the starting point, end point and step size of the icon, that is, np.arange (0, 1, 0.01) means that the calculation starts from 0, step size is 0.01, and the color of the graph is set to green after 1. SnowNLP classifies positive and negative emotions, reads each comment and uses it to calculate a sentiment score between 0 and 1. When the score is greater than 0.5, the emotional polarity of the sentence is biased towards active, and when the score is less than 0.5, the emotional polarity is biased toward negative. If the more biased both sides, the emotions are even more.

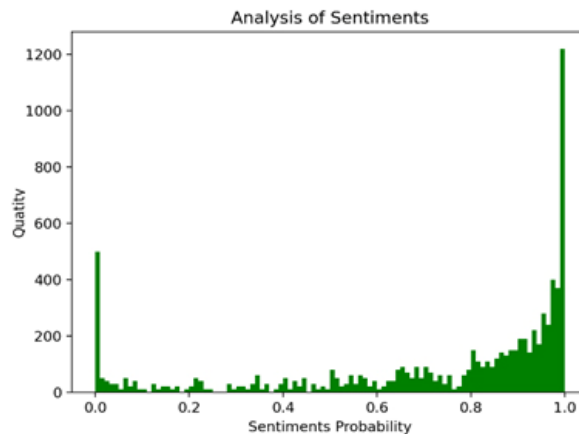


Figure 2 Sentiment analysis chart of five-star hotel reviews in Nanjing from 2019 to 2021.

As can be seen from Figure 2, five-star hotels in Nanjing from 2019 to 2021 are widely liked and praised by residents, which is mainly reflected in the fact that tourists' evaluation of their

stay experience is mainly concentrated in the positive emotional interval, while the evaluation distribution of the negative emotional interval is very small.

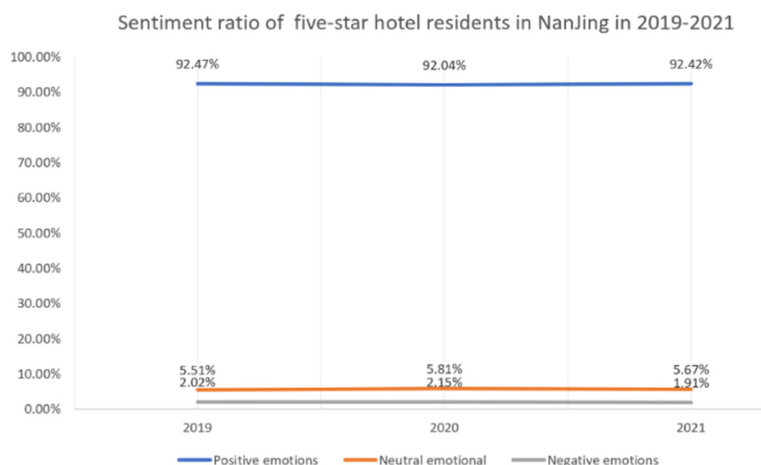


Figure 3 Proportion of guest reviews sentiment in five-star hotels in Nanjing, 2019-2021.

According to Figure 3, from 2019 to 2021, the proportion of positive emotions in tourists' evaluation of five-star hotels in Nanjing remained above 90%, while the proportion of neutral and negative emotions was relatively small, among which the proportion of negative emotions was always lower than 5%. Although the praise rate is slowly declining, the overall decline is small, and the subsequent changes are basically stable. As can be seen from the line chart of the emotional distribution of guests, the hotel's praise rate has a trend of warming in 2021. On the whole, tourists have high satisfaction with five-star hotels in Nanjing and significant positive emotions, which reflects that five-star hotel operators can meet the tourism demand of guests to a high degree on the whole, but there are still some deficiencies in hotel management.

4 Conclusions and prospects

4.1 Research conclusion

It is not difficult to see the data visualization analysis of Nanjing Five-star hotel 2019 to 2021, the content of the visualization and satisfaction of the hotel is mainly concentrated in the following aspects: (1) From the room type, most guests are willing to choose the number of floors, and open a picture of the chic landscape. The design of the hotel room should pay attention to the customer's feelings, reflect the characteristics of the design, enjoy the full vision and experience of customers, and leave the greatest comfort to the guests; (2) From the breakfast, stay in this kind of five- star Guests at the hotel have more attention to the dining in the morning, including whether the room is early, children's early problems, and the quality of breakfast; (3) From the hotel environment and facilities, the geographic environment in the hotel is very important. It is convenient for its accessibility, whether the environment is noisy, whether the

surroundings are beautiful, the hotel's guidelines are clear, is it close to the city business district, whether the hotel's security facilities are good, etc. It is an objective factor affecting the experience. The hotel's facilities and equipment is the basis of survival, which is the hotel's service. In order to adapt to people's growing demand, modern hotels are no longer a place to offer only accommodation, but from clothing and food, audio-visual entertainment, to sports and fitness, business shopping, medical beauty, etc. should have; (4) From the front desk, the front department is the window of the hotel, and guests have the most continuous departments after arriving at the hotel are the front desk, so the front desk has played a key role in the formation of the hotel's first impression, and good first impression can enhance guests satisfaction, so the hotel front desk personnel give customers a great extent to the customer's first impression of the hotel.

For the above questions, improve recommendations from the following aspects: (1) Enhance the quality of hotel room products. Room products are a big core of star hotel, and its quality is extremely important to customers. Especially in the four aspects of the room ventilation, the room size, the room is quiet, the room is quiet, and the hotel should be highly valued, and the hotel should improve the quality of the room product quality to strive for higher customer satisfaction. Improve the hotel room sound insulation effect, guarantee that the customer has a quiet, uninterrupted check-in experience. Personalization is performed on various facilities in the room; (2) Optimize the hotel environment and strengthen room safety. Star hotels should pay attention to the convenience of traffic. location, transportation and surrounding environments will affect customer evaluation of service quality in a certain extent. Focus on the overall comfort, especially public environments, including hotel decoration and style, lobby environment and facilities, recreational facilities, and overall hygiene, etc.^[4]. At the same time, strengthen room safety construction and guest information management, give customers peace of mind; (3) Improve quality of service and provide value hotel products. Customers provide excellent expectation quality products^[5]. Applying customers' relationship management ideas, providing customers with some complete unexpected service behaviors, making customers surprising, and improve customer satisfaction. Pay attention to customers' needs and requirements for catering, should pay attention to the restaurant environment and service, the quality of breakfast, the diversification of dishes and room delivery services^[6]. At the same time, pay attention to the provision of all-round services, including door keeping services, airport transfer services, luggage services, welcome services, wake up services, etc., need to pay attention to service details^[7]. It is necessary to pay more attention to the feelings after the guest arrived. You can take a more comfortable and quiet room. As long as you have improved, you can use a lower time money cost to continuously improve this type of customer satisfaction.

4.2 Research deficiencies and prospects

This paper only selects the review data of five-star hotels in Nanjing from 2019 to 2021 for visual analysis. In the future, the research object will be further expanded and the time span will be extended. First, the data crawler can be developed from a single platform to a multi-network platform, and the time range can be selected from review data in recent ten years. The second is to use Python crawler technology to capture the data of five-star hotels, and gradually expand the captured data to other star hotels and even budget hotels, so as to make comparative analysis of the data of different types of hotels, in order to provide more universal and instructive operation and management suggestions for the hotel industry.

References

- [1] Cheng Shanlan. Research on the development of Suzhou hotel's smart development [J]. Business Economy, 2014 (12): 49-51.
- [2] Luo Wei, Ren Yong, Mountain Xiu Ming. Methon-based mixed language programming and its realization [J]. Computer Application & Software, 2004 (12): 17-18 + 112.
- [3] Guo Lirong. Design of network reptility based on Python [J]. Electronic Technology and Software Engineering, 2017 (23): 248-249.
- [4] Shan Meizhen. Exploring the status quo of hotel management in my country, the problems and strategic development measures [J]. Consumption Guide, 2010 (08): 61.
- [5] Wang Jieer. Research on international hotel management group in my country's development strategy [J]. Journal of Tourism, 2006 (12): 70-76.
- [6] Chang Shujuan. Hotel management problem and countermeasures based on consumption cycle [J]. Business Age, 2014 (18): 109-110.
- [7] Zhao Liang. Enhance the countermeasures of my country's service quality [J]. Contemporary Economy, 2010 (15): 44-45.