



Big Data-based Visualization Analysis of the Travelogues of the Ancient towns - Take Huangyao Ancient Town and Xingping Ancient Town as examples

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Abstract

At present, the scale of the Internet celebrity economy continues to expand. At the same time, new fields and new forms are constantly emerging. Internet celebrity places as a link of the industrial chain of netroots economy also make great contributions to economic growth. This article will use Baidu index and python crawling technology to analyze the travel notes of Huangyao Ancient Town and Xingping Ancient Town. The results show that Huangyao Ancient Town and Xingping Ancient Town have not yet integrated landscape and culture, nor have they expanded local influence through quality hotspot content, resulting in a lack of cultural atmosphere creation and low integration of local scenic resources. Based on this paper, we propose suggestions for the optimization and enhancement of ancient town tourism, which can not only provide ideas for reference in the study of tourism consumption, cultural tourism and cultural revitalization in China's net places, but also expand the scope of application of tourism big data and natural language processing technology in tourism.

Keywords: *Internet Celebrity Economy, Travel Text, Big Data Analytics, Ancient Town Tour*

1. INTRODUCTION

Internet celebrity is an emerging group that emerged with the development of the Internet. The internet celebrity economy has emerged as a new business model. [1] In recent years, with the rapid development of net popularity economy in China's ethnic areas, China's urban image communication is evolving in the participatory communication in cyberspace, which is ushering in the era of the debate between large and small, strong and weak. By retrieving keywords such as "internet celebrity", "internet celebrity economy", "out of circle" and "network attention" on CNKI, we retrieved a total of 17192 related literatures. With the further penetration and development of "net popularity" culture in China's online and real society, the objects meant by "net popularity" have far exceeded the scope of "online celebrities"[2]. For example, in recent years, the study of "net-celebrity cities" has become the focus of some scholars. Some scholars said that the "internet celebrity city" is "a phenomenon of urban popularity promoted by social media"[3][5]. Afterwards, they further focused on the popularity of specific locations in the "net-celebrity cities", pointing out that "once a city's location is often featured

on Tik Tok and quick hand, it becomes a net-celebrity location, which will bring online and offline traffic" [4]. Through the mechanism of net popularity economy, we study modern consumption [6] and the path of urban cultural communication to actively enhance the image of the city, realize the cultural strength of the city, and drive the development of urban tourism and cultural and creative industries [4]. In this paper, we will analyze how ancient towns can be revitalized in the new era with the trend of cultural tourism integration through big data analysis technology, so that ancient towns can no longer be dusty, so that culture can be revitalized, and so that innovative marketing methods can be proactively used to improve the revenue benefits of ancient towns from both the demand and supply sides, which can provide a reference for more traditional types of tourist places.

2. RESEARCH METHODOLOGY

In the Internet era, people often use electronic mobile devices as the main way to choose a destination based on the level of online attention and the degree of good or bad reviews corresponding to the destination keywords. Data analysis using Python has strong data filtering and

product building capabilities, low open-source costs, easy cross-platform operation. It can improve the comprehensive use of these libraries, which will become the most used programming language in the field of data analysis in the future. Baidu Index takes the input keywords as the statistical object, and has the function of trend research. It can scientifically and effectively analyze and calculate the total search frequency of the searched keywords on the Baidu website. Therefore, we choose Baidu index and python technology for comprehensive analysis.

3.DATA VISUALIZATION ANALYSIS OF HUANGYAO ANCIENT TOWN AND XINGPING ANCIENT TOWN

3.1. Data Collection

Mafengwo.com is a new free-travel service platform based on travel social and travel big data. Mafengwo's users share travel itineraries, strategies, and experiences

in the form of travel notes. Under the environment of the sharing economy, Mafengwo's business operation model has gradually gained the favor of tourists, and its business has grown strongly. Now it has developed into a domestically influential online travel sharing portal. In addition, most of the pages are very long, and the travel content records and photos are very detailed. From this, it can be inferred that the authenticity of the itinerary is high, and the joy of tourists writing travel notes from the heart is revealed between the lines. Therefore, this paper selects the network travelogue of Huangyao ancient town and Xingping ancient town on the official website of Hornet's nest as the main data source, and uses python and Baidu index to compare and analyze, to more intuitively show the subtle dynamic changes hidden in the travelogue data of ancient towns, and explore the new way of ancient town tourism development.

3.2. Data Analysis

3.2.1. Micro hotspot data analysis

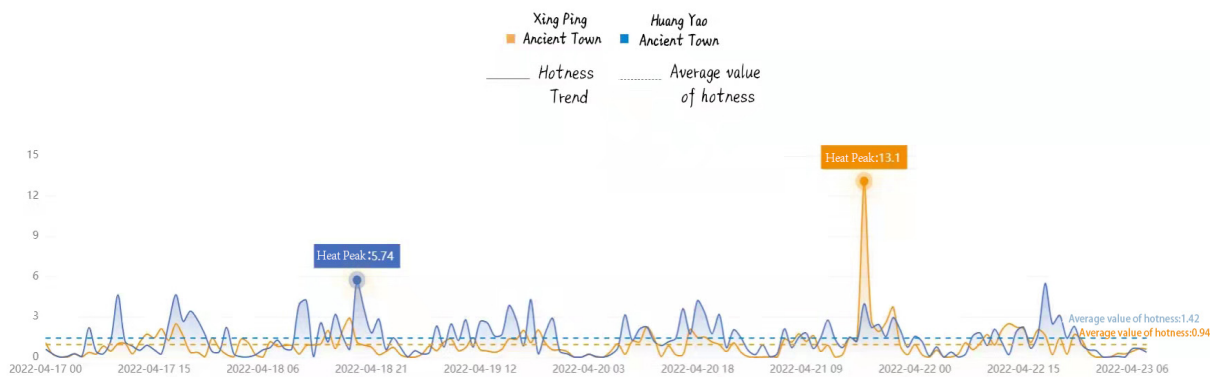


Figure 1. Huangyao Ancient Town and Xingping Ancient Town hotness index trend graph

Internet search engine is the most important entrance for travelers to obtain tourism information, and Baidu index characterizes the internet attention of travelers by reflecting the number of times keywords are searched. Since Xingping Fishing Village is located in the main viewpoint of Xingping Ancient Town, we chose Xingping Fishing Village and Huangyao Ancient Town for comparison and analysis. In this paper, the trend of April 2022 was obtained by entering the keywords "Xingping Fishing Village" and "Huangyao Ancient Town" on the official website of microhotspot data. From Figure 1, the average value of the heat of Xingping Fishing Village is 0.94, which is low and tends to be stable, while the heat of Xingping Ancient Town reached a peak of 13.1 at 17:00 on April 21, 2022; the average value of the heat of Huangyao Ancient Town is 1.42, which fluctuates significantly. The heat of Huangyao Ancient Town reached a peak of 5.74 at 19:00 on April 18, 2022. Among all the information related to Xingping Ancient Town, the most frequently mentioned words are Yangshuo, Guilin and Laozhai in that order. Among all the information related to Huangyao Ancient Town, the

most frequently mentioned words are Huangyao Ancient Town, ancient town and Guangxi. Through comparison, we found that although Xingping Ancient Town has a natural advantage in terms of its 20 yuan Instagram hotspots and unique scenery, Huangyao Ancient Town, as one of the "Top 10 Ancient Towns in China", is more popular in terms of frequency of searches. Therefore, the construction of tourist attractions in Xingping Ancient Town and Huangyao Ancient Town should highlight the advantageous resources and integrate with the surrounding scenery of Guilin City.

3.2.2. Baidu index analysis

Since Xingping Fishing Village is located in the main viewpoint of Xingping Ancient Town, we chose Xingping Fishing Village and Huangyao Ancient Town for comparison and analysis. I got the demand trend line graph, search index graph and information concern line graph in the past six months by entering "Xingping Fishing Village" and "Huangyao Ancient Town" in Baidu index.

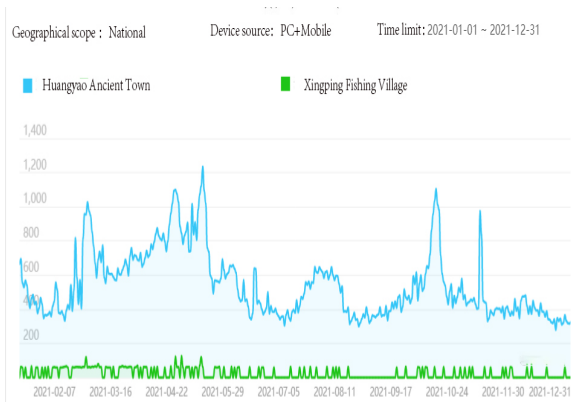


Figure 2. Folding line graph of demand trend between Huangyao Ancient Town and Xingping Ancient Town

Tourism is a popular behavior activity, and the development of tourism is closely related to the attention of tourists. Using the channel of "network attention" provided by Baidu index platform, we can quickly and accurately obtain the network attention and trend graphs of different time periods in the destination area, and explore the correlation between tourist flow and network information flow. Since Xingping Fishing Village is located in the main viewpoint of Xingping Ancient Town, Xingping Fishing Village and Huangyao Ancient Town were selected for comparison and analysis. The demand trend line graph, search index from 2021-1-1 to 2021-12-31 were obtained by entering the keywords "Xingping Fishing Village" and "Huangyao Ancient Town" in the Baidu index. Among them, the green line is Xingping Fishing Village, and the blue line is Huangyao Ancient Town. By looking at the data in Figure 2 for Huangyao Ancient Town and Xingping Ancient Town, we can see that the demand trend for Xingping Ancient Town is low and stable; the demand trend for Huangyao Ancient Town is higher and more volatile, especially during the May Day Golden Week, the first month of summer and the November Golden Week, when it reaches the highest. By analyzing Baidu index's search index, we can see that the average daily search index of Xingping Ancient Town is only 21, while the average daily search index of Huangyao Ancient Town is 542, which is a great difference. At the same time, by comparing the information concern line graph of Xingping Ancient Town and Huangyao Ancient Town, Huangyao Ancient Town fluctuates significantly and is significantly higher than Xingping Ancient Town.

3.2.3. Word frequency analysis of travel notes

In order to further improve the quality of the text, 98 travelogues of Huangyao Ancient Town and 58 travelogues of Xingping Ancient Town crawled from the official website of mafengwo.com were processed in this paper: the same author published related blog posts, the same travelogues and irrelevant travelogues were deleted, and finally 95 travelogues of Huangyao Ancient Town and 50 travelogues of Xingping Ancient Town were

filtered and stored in a document (*.txt), using jieba. The words that are meaningless to the study, such as "some", "time", etc., are removed, and the remaining data are analyzed by word frequency statistics, and the top ranked word frequency is obtained.

Table 1. High-frequency words of Huangyao Ancient Town

Main dimensions	Main categories	High frequency vocabulary
Tourism Subjects	Reason for travel	Weekend (13) National Day (6) Qingming (5) Long vacation (5) Convenience (12) Say go (4) Discount (5)
	Information channels	Tips (16) Travelogue (10)
	Length of stay	Two days (22) Three days (15) Four days (7) Five days (6) Six days and more (18)
	Visitor concerns	Safety (14) Time consuming (67) Scenery (39) Internet celebrity punch card (19) Tickets (14) Food (9)
Traveling medium	Visiting time	Evening (19) Afternoon (9) Morning (6) Noon (7)
	Transportation	High-speed train (30) Carpool (13) Bus (31) Train (7) Self-drive (18)
	Accommodation	Luggage (5) Hotel (38) Inn (23) B&B (11)
Tourist objects	Infrastructure	Distribution center (15) Parking (6)
	Natural Resources	Terraces (13) Gupta Mountain (13) Scenic Area (7) Mountain Water (7)

	Human Resources	Ancient City (12) Drum Tower (7) Stone Road (10)
	Surrounding Resources	Guilin (36) Longji (10)

Table 2. High-frequency words of Xingping Ancient Town

Main dimensions	Main categories	High frequency vocabulary
Tourism Subjects	Reason for travel	Distance (91) Location (54) Long vacation (5) Route (48) Convenient (52) Nearby (60) Discount (55) Free (47)
	Information channels	Tips (73) Travelogue (129)
	Length of stay	Within two days (15) Three days (5) Four days (7) Five days (4) Six days and more (14)
	Visitor concerns	Price (56) Time consuming (67) Weather (51) Internet celebrity punch card (153) Tickets (14) Food (204)
	Visiting time	Evening (99) Afternoon (93) Morning (65) Noon (32)
Traveling medium	Transportation	Electric car (78) Drive (41) Bus (103) Ride (40) High-speed train (120)
	Accommodation	Luggage (51) Hotel (306) Inn (102) B&B (77) Room (50)
	Infrastructure	Distribution center (15) Parking (6)

Tourist objects	Natural Resources	Sunrise and sunset (47) Two rivers and four lakes (46) Elephant Trunk hill (57) 20yuan landscape hitting places (210) Nine horses painting mountain (55) Ten-miles gallery (111)
	Human Resources	Pedestrian street (41) Slate road (10)
	Surrounding Resources	Liuzhou (4636) Pinganzhai (49) Dazhai (60)

By using python technology to extract the high-frequency words of Huangyao Ancient Town and Xingping Ancient Town travelogue web text and conduct classification statistics, mainly divided into three major dimensions tourism subject, tourism mediator and tourism object, through Table 1 and Table 2 can be seen: (1) Most of the high-frequency words in terms of tourism subject are travel reasons, access to information channels, stay time, tourist concerns and visit time. Most of them are short stays in the ancient town, only through others' travel tips to form a first impression, into certain popular net red accommodation stores and net red photo shooting place to pay attention to, the network hot events marketing appear less frequently. The travel mode of tourists is also more diversified, casual groups more choose self-driving, cycling and other ways, more short-distance tourists around the tour; (2) Most of the high-frequency words in the tourism medium is the mode of transportation, accommodation conditions and infrastructure construction such as parking; (3) The tourism object mainly includes natural resources, human resources and surrounding resources three major aspects, more is the role of the transit city to visit Guilin . It can be seen that the ancient town brigade has not yet been tapped and marketing the internet celebrity gene, is still the independent choice of tourists to read, rather than through the independent creation of cultural hotspots to guide the attention of tourists.

3.2.4. Emotion analysis of travel notes

For sentiment analysis, this paper uses SnowNLP, a Chinese natural language processing python library, which can implement Chinese word separation, word annotation, sentiment analysis and other functions. After opening the file, we first use "readlines ()" method to read all lines of text. Finally, Matplotlib is used for visualization, and the "np.range()" function is used to set the starting point, ending point and step length of the icon,

i.e. $\text{np.range}(0, 1, 0.01)$ means the calculation starts from 0, the step length is 0.01 and ends at 1, and the color of the graph is set to green. SnowNLP performs positive and negative sentiment classification, reads each comment and uses it for sentiment value analysis, and finally calculates a value between 0 and 1. When the score is greater than 0.5, it means the sentiment polarity of the sentence is positive, and when the score is less than 0.5, the sentiment polarity is negative. In addition, if it is more biased to both sides, the emotion is more biased.

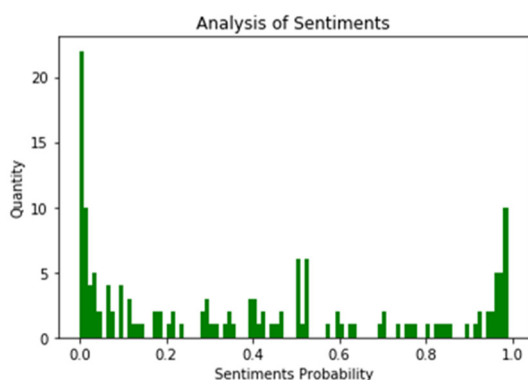


Figure 3. Sentiment analysis of Huangyao Ancient Town obtained using SnowNLP

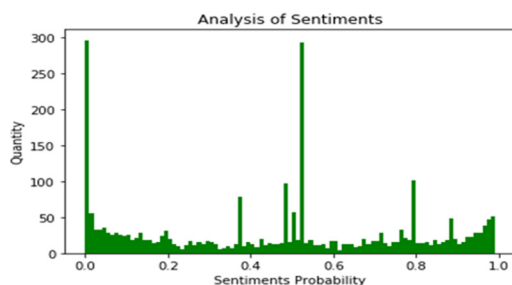


Figure 4. Sentiment analysis of Xingping Ancient Town obtained using SnowNLP

From the results in Figure 3 and Figure 4, we can know that 48.9% of the results of Huangyao Ancient Town emotion bias negative, 51.1% of the results of emotion bias positive; 49.1% of the results of Xingping Ancient Town emotion bias negative, 50.9% of the results of emotion bias positive. It can be seen that the positive emotion and negative emotion ratio is basically equal, the operators of the ancient town tourism failed to better meet the tourism needs of the residents, there are still some shortcomings.

4.CONCLUSION AND RECOMMENDATIONS

4.1. Research conclusions

Through the big data analysis of the results of the network travelogue, it can be seen that Xingping Ancient Town and Huangyao Ancient Town, despite the differences in resources, still cannot play the maximum value under the driving effect of the network events of

heat and traffic and the net red hit spots, comprehensive analysis of the following problems exist: (1) Cultural excavation is not enough, single tourism products, failure to refine its cultural connotation and deepen, easy to cause the flow of information transmission bias caused by the tour of the actual feeling and the media to convey the "top ten most beautiful ancient towns" and "20 yuan Instagram hotspots in the Lijiang River" expectations. Relatively wash, the formation of tourism image shielding, reducing the possibility of word-of-mouth and revisit rate; (2) Infrastructure is not complete, tourists do not stay long, cannot effectively interact with the culture of the ancient town, inhibited the vitality of the ancient town tourism; (3) The awareness of protection is not strong, the scenery suffered damage, the ancient town tourism reception capacity is low. In response to the above problems put forward a few suggestions.

4.2. Recommendations

4.2.1. In-depth exploration of characteristic resources and development of diversified tourism products

Each ancient town has its own unique characteristics, which can be organically integrated into the tourism development process to leave a deep impression on tourists. Therefore, we need to use the ecological environment of the ancient town's dreamland home to meet the needs of different tourists in a market-oriented manner. It is necessary to develop the tourism of the ancient town from the current sightseeing tour to a more leisurely diversified tourism project, and allow tourists to spiritually experience the local folk customs and long-standing cultural heritage of the ancient town in the process of participating in the hands-on production.

4.2.2. Improve infrastructure and standardize market management

At present, the infrastructure of the ancient town cannot meet the needs of tourists in all aspects and needs to be continuously improved. First of all, it is necessary to create convenient transportation, such as adding a special tourist bus line for the ancient town, so that tourists can reach the ancient town more conveniently, scientifically setting up parking lots and adding parking spaces to meet the maximum parking needs of self-driving tourists and holidays. Secondly, improve the road signs in different blocks of the ancient town, and scientifically arrange the toilets, which are often separated by about 400m. In a word, from the aspects of food, housing, travel, shopping and entertainment, comprehensive use of "visible hand" and "invisible hand" to effectively manage the tourism industry.

4.2.3. *Maintain the style of the ancient town and gradually upgrade tourism products*

The biggest highlight of the ancient town is the quaint blue brick, gray tile and wooden structures that have been kept relatively well up to now, but the style and appearance of the ancient town has suffered a certain degree of damage since its development. Therefore, the relevant government departments must first strengthen the protection of ancient buildings. Adhere to the principle of repairing the old as the old, organically combine modern construction techniques with ancient advanced technologies, and hire professionals who have been specially trained and obtained corresponding qualifications to conduct regular inspections and regular maintenance of the building. Secondly, it is necessary to promote the transformation and upgrading of the main body of the tourism product market, and change the development thinking to combine historical culture, landscape scenery and rural scenery, pay equal attention to natural development and cultural protection, and develop ancient towns and new rural construction at the same time, so as to form a composite tourism product. In addition, the participation of the public in the development of tourism products should be increased to make tourism products a mass product. For example, Xingping tourism products should be transformed and upgraded from the previous business conference tourism to leisure vacation tourism.

5. RESEARCH DEFICIENCIES AND PROSPECT

This paper combines ancient town tourism with big data technology to better understand the concerns of tourists, and comprehensively explores the development status of ancient town tourism under the internet celebrity economy. However, this study still has some shortcomings and needs to be expanded. First, this paper only selects the travel data of Huangyao Ancient Town and Xingping Ancient Town for visual analysis. In the future, the research object will select the travel data of ancient towns in different provinces to expand the research object. The second is to use Python crawler technology to gradually capture the travel data. Expand to other ancient towns, so as to make comparative analysis of the data of different types of ancient towns, in order to provide more general and instructive management suggestions for ancient towns.

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