Research on Tourism Image Perception of Naozhou Island in Zhanjiang Based on Network Text Analysis

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Abstract. At present, China still has many islands with rich tourism resources but lagging in tourism development, and most of them do not have a particular tourism image. Studying tourists' perception of island tourism is of great significance for constructing a differentiated tourism image. With the development of the Internet, online travel notes and comments on island tourism can reflect tourists' perception of the island's image. This article takes Zhanjiang's Naozhou Island, which is in the initial stage of tourism development as an example, and explores tourists' cognitive and emotional images of Naozhou Island through the network text analysis method. The research finds that characteristic scenic spots and characteristic food are the key elements for creating a differentiated image. According to the situation with the largest proportion of neutral emotions and the related issues of negative emotions, corresponding promotion strategies are proposed to provide a reference for developing similar island tourism.

Keywords: Island Tourism · Tourism image perception · Zhanjiang Naozhou Island · Network Text Analysis

1 Introduction

1.1 Research Background and Purpose

Islands have become tourist destinations that more and more people yearn for because of their unique natural and human resources. But from the perspective of the development of the tourism industry, there are still many islands in China that are still underdeveloped, and tourism construction on these islands is lagging behind. Naozhou Island in Zhanjiang City, Guangdong Province, is a typical case.

Zhanjiang Naozhou Island is the largest volcanic island in China, which locates about 40 km southeast of Zhanjiang City, Guangdong Province. It is rich in seafood such as abalone and lobster. It has the ancient relics of the Song Emperor and the Naozhou Lighthouse, one of the three famous lighthouses globally, attracting many tourists. However, the tourism development of Naozhou Island is still in its infancy.

Regardless of the reception service facilities such as scenic spots and accommodations, as well as the construction of soft environments such as human resources, publicity and promotion, they all need to be improved. Compared with the same type of Beihai Weizhou Island, the tourism image is weak.

Tourism image perception is an essential link between tourism development and tourist experience [1]. Only by starting from the perception of tourists, tapping the needs of tourists, and understanding the expectations of tourists for the destination, can we build a differentiated destination image and create a market-competitive tourism product.

1.2   Related Research Progress

Tourist destination image (TDI) is an important factor that affects tourists' intentions and decision making. It's also an important content of tourism destination marketing and a key aspect to improving tourism destinations' core competitiveness [2].

Extensive researches have proved that the tourist destination image has a profound impact on the feelings and experience of tourists, and there is a positive correlation between it and customer satisfaction [3]. The tourist destination image can help determine the advantages and disadvantages of tourist destinations and market positioning [4] and help marketers carry out marketing activities [5].

With the development of network technology and the free and open nature of the Internet, the travel notes and comments published by tourists on the network platforms can better reflect the tourists' perception of the tourists' destination image [6]. Since 2010, the network text analysis method has gradually become a popular research method for studying the perception of tourists' image of a certain tourist destination, and some scholars have combined questionnaire survey method and network text analysis method to conduct research [7, 8].

With the development of island tourism, the tourism images of some famous islands in China have received attention and research, such as Weizhou Island in Guangxi [9], Meizhou Island in Fujian [10], and Shengsi Islands in Zhejiang [11]. However, the research on tourism image perception of underdeveloped islands such as Zhanjiang Naozhou Island is still in a blank state.

Based on previous studies, this research selects the online travel notes of Naozhou Island in Zhanjiang as the research sample, and uses the network text analysis method to explore tourists' perception of the tourist image of Naozhou Island, aiming to explore the image elements that can be shaped. And this can provide more reasonable and scientific suggestions for Naozhou Island's future tourism development and provide a corresponding reference for other similar island tourism development.

2   Research Method and Sample Selection

2.1   Network Text Analysis Method

Network text analysis is a research method that combines network communication research and text analysis to describe the content from network text objectively, systematically and quantitatively [12]. In this paper, we use travel notes related to Naozhou

Table 1. Sampling Result

Travels notes source	Number of travels notes before filtering	Number of travels notes after filtering
Ctrip.com	68	26
Mafengwo.com	74	8
lvmama.com	80	5
Total	222	39
Total words after screening 13758		

Island from the Internet as research samples, then use ROST Content Mining software (ROST CM software) as a tool for network text analysis. Firstly, we selected effective and relevant travel notes on the Internet, then organised the text, processed it into the format required for software analysis, and imported them into the ROST CM software for word segmentation, word frequency analysis, semantic network analysis, and sentiment analysis. Finally, we got the Zhanjiang Naozhou Island's network text analysis results.

2.2 Sample Selection

The word "Naozhou Island" is used as a keyword to search travel notes on the well-known domestic travel websites Ctrip.com (hereinafter referred to as "Ctrip"), Mafengwo.com (hereinafter referred to as "Mafengwo"), lvmama.com (hereinafter referred to as "Lv-mama"). The search results obtained are as follows: There are 68 related travels notes on Ctrip, 74 on Mafengwo, and 80 on Lvmama, a total number of 222. In order to ensure the authenticity and objectivity of the research samples, the author identified and screened the above samples, eliminated advertisements, and eliminated duplicate travel notes and travel notes that were out of timeliness. After screening, 39 articles with a total of 13,758 words were finally obtained. See the sample selection results in Table 1 for details.

3 Data Analysis

3.1 Tourist Cognitive Image Analysis

3.1.1 High-Frequency Words Statistics

Tourists write travel notes through memories, and their high-frequency words used represent relevant cognition. Statistics and analysis of high-frequency vocabulary help to understand tourists' perception of the island. Use ROST CM to filter out high-frequency words unrelated to image perception, then sort out 60 of the highest-frequency words. The details are in Table 2.

From the perspective of part of speech, high-frequency words contain nouns, verbs and adjectives. Nouns are the majority with 41 words, while adjectives with 11 words and verbs with 8 words are rare. Nouns mainly reflect the tourists' needs for Naozhou Island's

Table 2. Top 60 high-frequency words about Zhanjiang Naozhou Island

Rank	Label word	Frequency	Rank	Label word	Frequency	Rank	Label word	Frequency
1	Naozhou Island	91	21	Restaurant	12	41	traffic	8
2	pier	58	22	navigation	12	42	fresh	8
3	lighthouse	54	23	banana	12	43	develop	8
4	ferry	44	24	Donghai Island	12	44	arrive	8
5	island	42	25	motorcycle	11	45	road	8
6	seafood	29	26	oysters	11	46	time	8
7	scenic spots	28	27	accommodation	11	47	station	8
8	southeast	25	28	scenery	11	48	tricycle	8
9	chartered car	22	29	kilometer	11	49	photograph	8
10	Zhanjiang	20	30	driver	11	50	round the island	8
11	beautiful	19	31	drive	11	51	China	7
12	beach	19	32	the three biggest	10	52	past	7
13	suggest	17	33	place	10	53	convenient	7
14	Turtle city	16	34	tourist	10	54	original	7
15	sunrise	14	35	various	9	55	process	7
16	minute	14	36	afternoon	9	56	tasty	7
17	sandy beach	14	37	fisherman house	9	57	weather	7
18	hour	14	38	beside	9	58	cheap	7
19	island	13	39	Nayan Sea	9	59	choose	7
20	volcanic rock	13	40	Inn	9	60	famous	7

(Note: In the table, the different words about "Motor" and "Oyster" but have the same meaning are merged into "Motor" and "Oyster" respectively)

characteristic scenic spots such as "Lighthouse" and "Volcanic rock", special cuisines such as "Seafood", special entertainment activities such as "Sunrise", and tourists' needs for food, accommodation, and transportation such as "Restaurants", "Motorcycles" and "Sunrise". Adjectives mainly reflect tourists' intuitive and subjective feelings on the image of scenic spots, such as "Beautiful", and their evaluation of local characteristics, such as "Fresh". The verbs mainly reflect the experience and activities of tourists in the travel process.

From the perspective of the meaning of words, the words mentioned often mainly focus on the five aspects of scenic spots, activities, food, transportation and the feelings of tourists.

3.1.2   Analysis of High-Frequency Words in Scenic Spots

The words about scenic spots include "Lighthouse", "Beach", "Beautiful", "Turtle", "Beach", etc. (see Table 3 for details), indicating that the focus of tourists' perception is on coastal tourism characteristics. Meanwhile, combined with relevant textual materials, tourists' evaluations of scenic spots on Naozhou Island can also be analysed.

The first-ranked scenic spot is Naozhou Lighthouse. As one of the world's three most famous lighthouses, this lighthouse is one of the two lighthouses with crystal mirrors in the world. It has a long history and attracts many tourists. However, tourists commented on it mainly as a "single scenic spot", and some tourists said that the lighthouse was closed "It is fenced and has been surrounded by the military management area next to it". The main reason is the lack of scientific development planning, a professional interpretive science system, and effective daily management. Tourists mainly take photos after arriving at the scenic spots, and the experience is not good.

The second-ranked scenic spot is the "Beach". There are many beaches on the island. Among them, the "Nayan Sea Rock Beach" which is a 100-m-long concave beach with black reefs formed by volcanic eruptions, is the most famous. Developers once invested in the construction of resorts, but due to financial problems, construction has stagnated. There are only empty concrete houses and no mature tourist reception facilities, so tourists expect to visit for free. Therefore, some tourists were discouraged because of the charge, "There is a road sign called Nayan Sea Rock Beach, and we didn't go in because someone sitting at the intersection to charge".

The third-ranked scenic spot is Turtle City, which is close to Nayan Sea Rock Beach. It combines breeding and protection for turtles. Tourists can visit giant turtles, but there is no commentary and identification system. Turtle City's popularity has increased since the popular web drama "The Hidden Corner" was filmed at its small pier. Recently, more and more tourists have come to take photos here.

As for the Song Emperor's relics scenic spots such as the Songhuang Well and Songhuang village on the island, are rarely mentioned because there is no tourist sign guidance system and no protection and development measures.

At present, there are no mature and standardized scenic spots on Naozhou Island.

Table 3. Statistics on high-frequency words of scenic spots in Naozhou Island

Rank	Label word	Frequency	Rank	Label word	Frequency
1	lighthouse	54	5	sandy beach	14
2	scenic spots	28	6	volcanic rock	13
3	beach	19	7	scenery	11
4	Turtle city	16	8	Nayan Sea	9

3.1.3 Analysis of High-Frequency Words in Tourism Activities

(1) Catering

The words about food and beverage activities on Naozhou Island mainly includes "Pier", "Seafood", "Restaurant", "Banana", etc. (see Table 4 on next page for details). Among them, the pier, as a concentrated place for seafood transactions and restaurants, frequently appears in travel notes. The high-frequency word "Seafood" that appears 29 times reflects that nearly half of the tourists are very concerned about the special seafood on Naozhou Island. "Fresh" is tourists' general evaluation of the island's characteristic aquatic products. "Tasty" and "Cheap" show that tourists highly praise the food. In addition, "Banana" has also been mentioned many times, which shows that tourists are quite concerned about the special tropical fruits on the island. However, few tourists mentioned famous restaurants in their travel notes, indicating that the catering and reception facilities on Naozhou Island are still relatively scattered, with no brand and scale.

(2) Accommodation

Table 4. Statistics of high-frequency words about catering activities

Rank	Label Word	Frequency	Rank	Label Word	Frequency
1	pier	58	6	Fisher-man house	9
2	seafood	29	7	fresh	8
3	restaurant	12	8	Process	7
4	banana	12	9	tasty	7
5	oyster	11	10	cheap	7

Table 5. Statistics on high-frequency words of traffic

Rank	Label Word	Frequency	Rank	Label Word	Frequency
1	pier	58	11	drive	11
2	ferry	44	12	round the island	8
3	southeast	25	13	traffic	8
4	chartered car	22	14	arrive	8
5	Zhanjiang	20	15	road	8
6	navigation	12	16	time	8
7	Donghai Island	12	17	station	8
8	motorcycle	11	18	tricycle	8
9	kilometer	11	19	past	7
10	driver	11	20	convenient	7

In the 3–1 high-frequency words table, the frequency of "Accommodation" and "Inn" is 11 and 7 times, and there are few other related descriptions. At present, the accommodation and reception facilities on Naozhou Island are mainly fishermen's homes, Inns, and low- and mid-range hotels. Some new small-scale speciality hostels are promoted and booked through WeChat, so there are very few public comments. On the whole, the tourists' perception of accommodation is mainly "not perfect".

(3) Traffic

In the data sample, there are a total of 18 traffic-related label words (see Table 5 details), which is obviously more than other categories, because the island traffic is special and impressive to tourists. High-frequency words about traffic include: "pier", "ferry", "southeast", "chartered car" and so on. At present, the main mode of transportation in and out of Naozhou Island is by ferry. Some tourists rent speedboats in a hurry, but the price is higher. The modes of transportation on the island include chartered cars, motorcycles, and tricycles. There is no complete public transportation system.

Traffic inconvenience is currently the most prominent problem. Most of the negative emotions in travel notes and reviews are related to traffic, as it is inconvenient whether going in and out of the island or traveling within the island.

(4) Leisure and Entertainment

Among the high-frequency words, the activities related to leisure and entertainment are "Sunrise", "Circling the Island", and "Photographing". The corresponding frequency is 18 times, 8 times and 8 times. At present, leisure and entertainment activities on the island are limited, focusing on watching the sunrise and leisure around the island. Some tourists mentioned night activities such as barbecue and KTV. Generally speaking, there are no special entertainment activities.

3.2 Tourist Emotional Image Analysis

Tourist sentiment analysis mainly analyzes the words used and expressed by tourists in travel notes. The paper examines the emotional color in sentences and words to obtain touriststs' overall image and perception images to the scenic spots.

3.2.1 Analysis of High-Frequency Words About Feeling

The label words for feelings include: "Beautiful", "Suggestion", "Fresh", etc. (see Table 6 for details). It can be seen from the high-frequency words of feelings that most of them are feelings with positive emotions, indicating that Naozhou Island generally brings tourists a pleasant travel experience.

3.2.2 Tourist Sentiment Perception Analysis

There are three types of emotions: positive emotions, neutral emotions and negative emotions. Different tourists have different emotional perceptions of scenic spots, reflecting different levels of satisfaction. After sorting out the valid travel notes in the WORD document, the comments are imported into the Rost Content Mining software for sentiment

Table 6. Statistics of high-frequency words about feeling

Rank	Label Word	Frequency	Rank	Label Word	Frequency
1	beautiful	19	5	original	7
2	suggest	17	6	tasty	7
3	fresh	8	7	cheap	7
4	convenient	7	8	past	7

analysis, and obtains the analysis result (see the Table 7 of the tourist sentiment perception analysis): The number of travel notes with positive emotions is 13, accounting for 33.33% of the total number; The number of travel notes with neutral emotions is 20, accounting for 51.28% of the total; The number of travel notes with negative emotions is 6, accounting for 15.38% of the total. The non-emotional words used to describe and express in the travel notes belong to neutral emotions.

(1) Sentiment Analysis Overview

From the analysis results, neutral emotions accounted for the highest proportion, as high as 51.28%, followed by positive emotions, and negative emotions accounted for the lowest proportion. Neutral emotions accounted for the highest proportion, indicating that the tourism experience, tourism services and facility construction on Naozhou Island have failed to provide tourists with a greater sense of satisfaction, and there is still much space for improvement. Through the analysis of negative emotions, breakthrough points can be found.

(2) Positive Sentiment Analysis

The positive emotions mainly manifest in the following aspects: firstly, the beautiful natural beach scenery and magnificent sea views; secondly, the ecological environment is excellent, "because it is far from the city, the sea is basically not polluted, and the environment is much better than the sea in the city. Thirdly, the fishing village is simple and honest, and the fishing methods and farming methods give tourists a positive feeling. "It gives people the feeling that it is primitive and pristine.". Fourthly, tourists are very concerned about the freshness and plumpness of the seafood of Naozhou Island. The seafood and aquatic products are very impressive, and the dining experience is highly rated. Tourists were surprised and said, "very fragrance and fresh".

(3) Negative Sentiment Analysis

Negative emotions are mainly reflected in: inconvenient transportation, tight accommodation, and limited scenic spots.

Traffic inconvenience manifests in the long waiting time for ferry boats entering and leaving the island, chaos and lack of proper management, significantly that queue jumps happen frequently during peak seasons. "It took four hours to wait for the boat when leaving the island." In addition, the roads on the island are relatively narrow, and traffic jams are frequent during peak seasons. The public transportation system on the island is not perfect. Most tourists need to choose chartered vehicles and pay high fees.

Table 7. Tourist Emotion Perception Analysis

Emotion Type	Number of Travel Notes	Proportion
Positive emotions	13	33.33
Neutral mood	20	51.28
Negative emotions	6	15.38
Total	39	100

The tight accommodation manifests in the limited number of hotels and hostels on the island, especially during peak tourist seasons. There are only 41 hotels and hostels on the island that can be queried on the Meituan APP, many of which are hostels with less than 5 rooms. In addition, many tourists said that the room conditions are too simple. The travel notes mentioned, "we could only find a hostel because there was no hotel when on the island." "The accommodation on the island is relatively simple".

The problem of limited scenic spots and lack of experience activities mainly manifests in that tourists basically focus on two projects on Naozhou Island, beach playing and historical relics sightseeing. The island is lack of unique activities, and most scenic spots can only be used for viewing and taking pictures, with a single function. Tourists cannot experience the cultural value of the relics. This situation has resulted in low tourist satisfaction and short stays.

3.3 Semantic Network Analysis

On the basis of online travel notes collation and high-frequency word analysis, the high-frequency word analysis results are imported into ROST Content Mining software. With eliminating meaningless words, social network and semantic network analysis are performed, and the semantic network diagram about relevant network travel notes of Zhanjiang Naozhou Island are obtained. (see Fig. 1 Semantic Network Diagram for details).

Most of the actual travel notes of the semantic network diagram are narrated around "One piece" and "Chartered car".

"One piece" is the central part, and the most relevant keyword is "Island", which shows that many tourists perceive the tourism image of Naozhou Island in Zhanjiang as a small area, and use "one piece" as the descriptive quantifier. The key words radiated by the central word "One piece" cover time, place, activities, and part of the subjective evaluation of tourists, including "Night", "Seafood", "Beach", "Ferry", "History", etc., reflecting the various activities present by tourists on the island. And these also reflect the needs for overnight stays and the historical and cultural experiences of tourists.

For the part centered on "Chartered car", the surrounding radiation words are closely related to traffic, such as "Bumps", "Navigation", "Driver", etc., indicating that the traffic is most concerned by tourists. Among the surrounding radiation words, the keyword "navigation" is close to the central word, which shows that many tourists cannot reach their destinations through the island's traffic guidance or public transportation system.
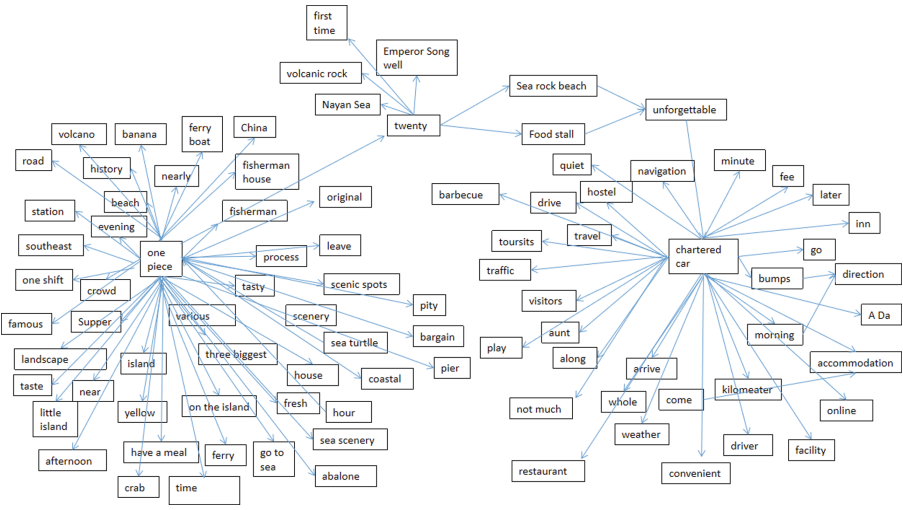
Fig. 1. Semantic Network Diagra

The backward road construction, public transportation system, and road guidance signs conflict with increasing tourists.

4   Conclusion and Discussion

4.1   Analysis Conclusion

This article analyzes tourists' cognitive and emotional images of Naozhou Island in Zhanjiang through network texts, and draws the following main conclusions:

Firstly, characteristic scenic spots and food are the prominent image representatives; the neutral emotions of tourists accounted for the highest proportion in the travel notes, which needs to be improved in many aspects.

Secondly, in terms of scenic spots, tourists mainly have a high level of perception of "Naozhou Lighthouse", "Nayan Sea Rock Beach", and "Turtle City". However, there are currently no mature scenic spots. They are all in the initial stage of development which is extensive. The negative sentiment manifests in the few scenic spots.

Thirdly, in terms of catering, the perception of "Seafood" is very high, and the positive emotions of tourists are mostly related to special seafood dishes. However, there are no exceptional restaurant brands yet.

Fourthly, in terms of accommodation, the perception of "Inn" is relatively high. However, the lack of accommodation and backward facilities has caused tourists to have some negative emotions.

Fifthly, in terms of transportation, tourists have a high degree of perception of "Ferry" and "Chartered Car", which are the main transportation. At present, the imperfect inbound and outbound traffic and the traffic on the island are the sources of tourists' main negative emotions.

Sixthly, in terms of entertainment and leisure, the perception of "Sunrise" and "Circle the Island" is relatively high. There is no special leisure experience activity, so there is much space for excavation and expansion.

4.2   Countermeasure Discussion

To enhance the tourism image of Naozhou Island, we need to start from two aspects: tourism image shaping and publicity. The specific measures are as follows:

Firstly, to create a positive tourism image: optimize the existing characteristic tourism resources, dig deeper into the cultural and natural tourism resources, form linkages between different attractions, fully use the rich products and resources of Naozhou Island, and vigorously develop Naozhou Island's characteristic cuisine, to create a characteristic food tourism image belonging to Naozhou Island; relying on the characteristics of the island to create new characteristic leisure experience activities, such as diving, surfing, sea fishing, etc., to enrich tourists' experience; improve infrastructure and reception facilities construction, and strengthen road maintenance, scientifically plan the public transportation. Strengthen the supervision and management of catering and accommodation reception facilities, standardize sanitation management, appropriately introduce hotel companies or groups to enter, and provide appropriate guidance and subsidies for inns and hostels to improve service levels.

Secondly, to improve publicity: clarify its tourism positioning, focusing on tourist attractions with the high level of tourist perception, supplemented by other tourism elements such as catering. Emphasis its own tourism advantages and characteristics; grasp online trends and combine popular trends into cultural propaganda designing, planning and element packaging; encourage the creation of short travel videos and texts, and provide creative incentives for local self-media creators.

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