Research on Tourist Perception of Grand Canal Cultural Heritage Based on Network Text Analysis : The Pingjiang Historical and Cultural District of Suzhou City as an example

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Taking Pingjiang historical and cultural block in Suzhou as an example, this paper collects 1436 tourist comment data from Ctrip. com with Python technology, and uses network text analysis method to analyze frequency words, semantic network and emotion, so as to evaluate the tourist perception characteristics and levels of the Grand Canal cultural heritage. The study found that: natural and humanistic landscapes, historical and cultural deposits, and the style of the Jiangnan Canal are fully reflected in the perception of visitors to the Pingjiang Historical and Cultural District; Tourists hold strong positive emotions towards the Pingjiang Road historical and cultural district, however, there is still more space for the transformation and upgrading of the district. Finally,suggestions for measures to improve the perception of tourists of the Grand Canal cultural heritage are given in terms of conservation first, cultural integration and innovative utilization.

1. Introduction

The Grand Canal is a major artery of commerce, transportation and cultural exchange in China's history, and was successfully selected as a UNESCO World Heritage Site in 2014. It not only has the world's leading ancient water conservancy and shipping engineering technology, but also has the qualities of spanning a long period of time, flowing through a wide area, rich historical relics, deep cultural heritage and precious heritage value.

The cultural heritage along the Grand Canal still plays a considerable role in today's water resources development, canal tourism, and historical and cultural research, which is both an important source for our understanding of the Grand Canal and a cultural heritage that requires our scientific protection and perpetual transmission(Ren Ziyu, 2016). The cultural heritage of the Grand Canal is rich in value, and it is of great significance to deeply explore the connotation of the cultural heritage for effective protection, rational use and

heritage development(Liu Binyuan, 2010). According to the definition of the Grand Canal cultural heritage, as a representative new cultural route heritage and dynamic heritage, the Grand Canal cultural heritage has a rich composition of resources, a large spatial and temporal scale, and a variety of functions(Shan Jixiang, 2009). As the Grand Canal is known for its spectacular natural beauty and rich human heritage, it is the culture that gives it its unique flavor. Cultural heritage provides resources for tourism development, and cultural heritage reaches out to the public through tourism(Xun Ying, 2014).

Tourism perception in this research is the process of tourists' perception of the culture of tourist attractions during tourism activities, including the process of collision and synergy between tourists' existing culture and the culture of tourist places, as well as tourists' personal perception of the culture of tourist places (FODNESS D, 1990). Cultural perception, as an important aspect of Grand Canal tourism for tourists, plays an indispensable role in the transmission, protection and utilization of the cultural heritage of the Grand Canal (Mao Nafeng, 2012). Suzhou is an important node of the Grand Canal, a World Heritage Site, and the Grand Canal (Suzhou section) runs through the city, bringing together rich historical and cultural relics along the route, of which the Pingjiang Historical and Cultural District is an important gathering and concentration of these cultural relics. The Pingjiang Historical and Cultural District in Suzhou is selected as a typical case study of Grand Canal heritage tourism, and it has important theoretical and practical

significance to research tourists' perceptions of Grand Canal heritage.

2. Research Review

Through the compilation of the existing literature, it is found that most scholars have focused their research on the perception of the Grand Canal mainly on the perception of the tourism image of the Grand Canal, the perception of the tourism destination image, the perception of tourism development and tourism scenic spots. Jiang Ting (2016) researched tourists' perceptions of the tourism image of the Grand Canal (Hangzhou section) through a web-based text analysis methodology. Pang Zhaolin et al. (2017) researched tourists' tourism image perceptions of Hongcun, aWorld Cultural Heritage site, through content analysis. Xuesong Liang (2009) analyzed the basic characteristics of tourists, tourism perception image evaluation, tourism environment, tourism services and management, and studied the tourism perception of Hangzhou Canal by tourists. Fang Tianhong et al. (2017) adopted a combination of questionnaires and field interviews to study residents' perceptions of the economic, social, and ecological impacts of the Grand Canal tourism development. Yan Min et al. (2016) used ROST CM6 software to analyze tourists' perceptions and impressions of the scenic area in terms of tourism landscape, tourism route, tourism environment, and facilities and services, taking Wuxi Qingmingqiao Ancient Canal Scenic Area as an example. The research on the cultural

heritage perception of the Grand Canal is not yet in-depth. As the Grand Canal culture is an important component aspect of Grand Canal tourism, cultural heritage tourism is getting hotter and hotter, and there is an urgent need to research how tourists perceive the cultural heritage of the Grand Canal.

In addition, with the increasingly close relationship between the Internet and tourism, many tourists like to share their travel ideas, travel experiences, and post-trip feelings to Internet terminals such as travel websites, blogs, and friend circles, which convey travel perceptions to a large number of potential tourists and implicitly influence the attention hotspots of tourists' trips (Zhang Jianrong, Zhao Zhenbin, (2018). Obtaining data from the Internet to research relevant topics is an important source of data. The current trend of collecting web travelogue texts as data sources and using web analysis methods for research is gradually becoming a popular trend. From the domestic literature, Wang Xinliang (2011) researched the issue of tourist consumption preferences in the ancient town of Zhouzhuang based on the perspective of online travelogues. Fang Shimin et al. (2016) used content analysis to explore Internet-transmitted tourists' perceptions of Shaoshan's tourism destination image by collecting online travelogues. Na Mengfan et al. (2016) took online travelogues posted by tourists in Dalian as a tourist destination as a data source and investigated the dimensionality issue of tourist destination imagery analysis by means of rooting theory and multi-level coding text analysis method. Wang Fang et al. (2018) collected 156 valid travelogues of Hefei city through the Ctrip travel

website and adopted the web text content analysis method to analyze the tourism destination image of Hefei city from individual tourist perceptions, cognition, emotions and overall attributes. From the foreign literature, Stepchenkova and Moprison (2006) studied the differences in textual content in the websites of Russian and American travel agencies and analyzed the tourist imagery of some Russian cities. P. Racherla et al. (2010) conducted a social network analysis of collaboration patterns in the tourism community from co-authorship data obtained from three top tourism journals and showed that although the network of tourism researchers is large and complex, it is still fragmented in the form of a few core research groups, while these research groups sometimes act as nodes in the network. Q. Luo et al. (2015) considered the shared electronic word-of-mouth communication among tourists on social networks as a network based on the social relationships of social network site users, and applied social network analysis methods to examine the communication characteristics of shared electronic word-of-mouth among travel-related tourists on social networking sites from the perspective of the self and the whole network. X. Wu et al. (2016) used the web text analysis software Rost CM to extract high-frequency feature words from tourism images to analyze the positive and negative influencing factors of tourism evaluation by collecting, screening and analyzing web data, taking Guangdong Huanglong Yan She ethnic style tourism area as an example, and concluded that the ethnic style, cave wonders and others of the She ethnic group were recognized by

tourists as tourism image perceptions. In general, few current studies have examined the cultural heritage of the Grand Canal, especially the perception of specific historical and cultural districts, through online travelogues.

This research takes the historical and cultural district of Pingjiang, Suzhou, a Grand Canal heritage site, as the object of research. Based on data from online travelogues, this study uses online text analysis to analyze tourists' perceptions of the Grand Canal cultural heritage and to provide references to the direction of Grand Canal tourism development and development.

3. Research design

3.1 Research Area Overview

The Pingjiang Historical and Cultural District is located in the northeast corner of the ancient city of Suzhou, from the Ring River in the east to Linton Road in the west, from Ganjiang East Road in the south to Baita East Road in the north, covering an area of about 116.5 hectares, and is one of the seven heritage sites of the Suzhou section of the Grand Canal of China. Its core value lies in the complete preservation of the unique urban layout designed by Wu Zixu when he built the Great City of Helu in 514 B.C.When he built the Great City of Helu, which is by far the most complete preservation of the traditional urban pattern, architectural style and living customs in Suzhou, and is regarded as the epitome of the ancient city of Suzhou. Pingjiang Historical and Cultural District, which won the Honorable Mention Award for World Cultural Heritage Protection in the Asia-Pacific Region of the United Nations in 2005, was awarded the title of Top Ten National Historical and Cultural Streets by the Ministry of Culture and the State Administration of Cultural Heritage in June 2009, was approved as a national 4A tourist attraction in January 2011,

〈Table 1〉 Heritage resources combing in Pingjiang historic district

Categories		Specific contents
Heritage Area/ Buffer Zone Area	Heritage area: 9.8 hectares	Buffer zone area: 45.3 hectares
Heritage Composition	Water system, streets and alleys	A street and a river, "the double chessboard"pattern of parallel water and land、 "all the homes are pillowed by the river"
	Cultural Heritage Sites	The Couple's Garden, the Quanjin Hall and many other famous people's residences
Outstanding value	The important distribution center and starting point of transportation in Jiangnan in the 16th and 18th centuries, and the storage center of grain in ancient times	
	A typical area with a double chessboard pattern of water and land paralleling each other, it is a model of unique urban planning in Suzhou in ancient times	
	The most original and complete core area of traditional dwellings, historical environment and lifestyle in the ancient city of Suzhou	

〈Figure 1〉 Pingjiang Historical and Cultural District and Scenic Area Signage
(taken on August 15, 2022)

and was inscribed on the World Cultural Heritage List on June 22, 2014.

3.2 Web text acquisition

3.2.1 Text sources

Ctrip, as the leading online travel service website in China, is also the OTA giant in China. 2019 Ctrip's monthly active users rank in the first tier, reaching 74,715,100, accounting for 43.35%, and is the top1 monthly active user of online travel platforms in China. therefore, the Ctrip platform has a wide influence and a large number of real reviews provided by users about heritage sites and travel tips, travelogues, etc. Therefore, this paper chooses Ctrip, an online travel platform, to obtain online reviews and travelogue texts of the Pingjiang Cultural District, a heritage site of the Grand Canal Suzhou section, so as to ensure the uniformity of text sources and the strong representativeness.

3.2.2 Text Acquisition

The program was written using Python software to collect user review data of Pingjiang Historical and Cultural District from the Ctrip website respectively, and the review data included fields such as user name, review time, review content, and rating.All reviews were sorted chronologically to obtain the text of visitors' reviews for the destination between January 1, 2017 and October 22, 2022, and saved as an Excel file.

3.2.3 Text filtering

In order to ensure the relevance and validity of the comment text, the comment data needs to be cleaned and noise-reduced after all the comments are obtained. For example, we eliminate pictures and comments that are not related to the destination; we eliminate advertising comments and duplicate comments; we convert English and traditional

Chinese characters to simplified Chinese characters; we correct typos and aliases; and so on. After finishing, a total of 1513 reviews were collected in this study, 1436 valid reviews were filtered, and the total number of words after filtering was 116007.

3.3 Research Methodology

3.3.1 Social network analysis

Based on the social network perspective, this study uses Gephi software to empirically analyze the intrinsic structural characteristics among the tourism elements in the Pingjiang historical and cultural district. First, extract high-frequency keywords, that is, to extract the words that appear more frequently from the comment data. In the process of extracting high-frequency words, first clean up expressions, spaces, line breaks, etc., and then use the jieba tool for word segmentation, count the frequency of each word through Python software, and filter stop words through the stop dictionary. Second, build a keyword co-occurrence matrix. When two high-frequency keywords appear together in a comment, the number of co-occurrences is 1. If these two keywords appear in the next comment, the number of co-occurrences is 2, and so on. The co-occurrence times of all keywords are calculated to form a keyword co-occurrence matrix. Finally, the keyword co-occurrence matrix from the previous step is input into Gephi software and visualized using Gephi to generate a keyword co-occurrence network.

3.3.2 Emotional analysis

Sentiment analysis of text can also be called the analysis of semantic tendencies of text, which is used to detect the subjective tendency semantics embedded in the text language and is the key to the deep semantic understanding of text(Tang Lingyan, et al., 2021). It is mainly used to obtain people's subjective emotional attitude tendency towards an object by mining, extracting and assigning textual emotion words and emotional adverbs. The results of the sentiment analysis are divided into positive, negative, and neutral sentiments. Among them, word-level sentiment analysis based on sentiment vocabulary extraction is more relevant and reliable, and it is also a prerequisite and foundation for sentence and chapter sentiment analysis. At present, sentiment analysis of text words is mainly based on sentiment dictionaries, and the more commonly used sentiment dictionaries include Hownet Sentiment Dictionary, NTUSD Sentiment Dictionary of National Taiwan University, and Li Jun Chinese Praise and Derogatory Dictionary of Tsinghua University. The sentence-level sentiment analysis is to synthesize the sentiment tendency of a sentence by assigning sentiment to words of different lexicons in the sentence, but the accuracy is relatively limited, among which the accuracy of ROST cm6 is better, reaching 80.6% (Rao Yulei et al., 2016). Therefore, the subsequent analysis will be based on the Hownet Knowledge Network Sentiment Dictionary, combined with the specific content of the comment corpus of Pingjiang Road, a Grand Canal heritage site, to match and extract sentiment

words through the custom coding function of KH coder software, and use the ROST cm6 software to output the tourism comment data branches of Pingjiang Road into a text file, and read the text of tourists' comments through the software, so as to output sentiment segmentation statistics results.

4. Analysis of results

4.1 Word frequency analysis

Using ROST cm6 software to propose high-frequency words, 4843 words were output, and the words with frequencies higher than 20 were extracted, and 186 feature words were obtained. The high-frequency words reflect the tourists' awareness of each element in the tourism image of Pingjiang historical district, and due to the length of the paper, the top 60 high-frequency words are ranked from high to low as shown in <Table 2>. Overall, the lexical nature of high-frequency words is dominated by nouns, adjectives, verbs, and adverbs. The nouns mainly refer to the local tourist places, attractions, streets, buildings, snacks, transportation, neighborhoods, and accommodation in the Pingjiang Historical and Cultural District. Adjectives are subjective evaluations of visitors to the historical and cultural district of Pingjiang, such as the food, natural environment atmosphere, historical and cultural atmosphere, attractions and objective conditions of the tour process. The verbs express the thoughts, behaviors, and perceptions of visitors during their visit to the historical and cultural district of

Pingjiang. In the tourists' comments, there are 41 nouns, accounting for 68.33%; 11 verbs, accounting for 18.33%, 5 adverbs, accounting for 5.00%; and 3 adjectives, accounting for 8.30%. In terms of number, there are more nouns than verbs, more verbs than adverbs, and more adverbs than adjectives. This is largely consistent with the relevant analysis of scholars Zhenzhen Zhang and Junyi Li (2014).

It can be seen that the tourists' perception can basically reflect the original historical appearance and cultural heritage of Pingjiang Historical and Cultural District, and "Jiangnan, old street, ancient city, ancient lane" is the overall image perception of tourists. The image of Pingjiang Road as the old street of Suzhou has been deeply rooted in people's hearts. The description of "small bridge and flowing water, Jiangnan, rhythm and miniature" highlights the characteristics of Jiangnan water town. "Pingtan, culture, Kunqu", etc. are the cultural elements and intangible cultural heritage elements of Suzhou. "Snack, small store, taste, food, atmosphere, literature, business" is the tourists' feeling and experience of the special snack, literature and small store, life and business atmosphere in Pingjiang Historical and Cultural District. The "Zhuozheng Garden, Guanqian Street, and Museum" are other scenic spots where tourists around the Pingjiang Historical and Cultural District perceive the spatial radiation effect. Especially the Zhuozheng Garden, known as one of the four famous gardens in China, which is closer to the historic district of Pingjiang, is often mentioned by tourists.

In order to more intuitively express the field perceptions of tourists in the Pingjiang historical

〈Table 2〉 Statistics of high-frequency words for tourists' comments in Pingjiang Historic District

Order	Words	Frequency	Wordiness	Order	Words	Frequency	Wordiness
1	Pingjiang	1021	Noun	31	Stores	82	Noun
2	Suzhou	804	Noun	32	Visitors	80	Noun
3	History	473	Noun	33	Period	75	Noun
4	Satisfied	374	Verb	34	Gourmet	70	Noun
5	Not bad	232	Adjective	35	Reserved	69	Verb
6	Small bridge and flowing water	226	Noun	36	Breath	65	Noun
7	Feelings	175	Noun	37	Lngering charm	65	Noun
8	Snacks	166	Noun	38	Scenery	64	Noun
9	And	163	Verb	39	Old Street	64	Noun
10	Small Shop	155	Noun	40	Literature and art	64	Noun
11	Featured	154	Noun	41	Business	63	Noun
12	Gangnam	149	Noun	42	Feelings	63	Verb
13	Very	148	Adverb	43	Attractions	62	Noun
14	It is	146	Adverb	44	Gusu	61	Noun
15	Old Street	145	Noun	45	Along the river	61	Verb
16	Local	141	Noun	46	Stuff	59	Noun
17	Ancient City	133	Noun	47	Guanqian Street	59	Noun
18	Pingtan	128	Noun	48	Life	58	Noun
19	People	126	Noun	49	Museum	57	Noun
20	No	111	Verb	50	Cheongsam	57	Noun
21	Take a stroll	106	Verb	51	Complete	56	Adjective
22	Compare	106	Adverb	52	Miniatures	56	Noun
23	Culture	102	Noun	53	Architecture	55	Noun
24	Street	100	Noun	54	South of the Yangtze River	55	Noun
25	Save	96	Verb	55	Slowly	55	Adverb
26	Worth	95	Verb	56	Suitable for	53	Verb
27	Like	90	Verb	57	Time	53	Noun
28	Really	90	Adverb	58	Path	53	Noun
29	Taste	86	Noun	59	One Street	53	Noun
30	Zhuozheng Garden	86	Noun	60	Bustling with activity	52	Adjective

and cultural district, we generated the tag word cloud map <Figure 2> online with the high-frequency words listed in <Table 2>. The size of the font in <Figure 2> corresponds to the frequency of the words, and it is obvious that "Suzhou, Pingjiang, small bridge and flowing water, ancient town, history, Pin tan, old street, and characteristics" are the hot words mentioned in tourists' comments.

〈Figure 2〉 Word cloud map of the Pingjiang historical and cultural district
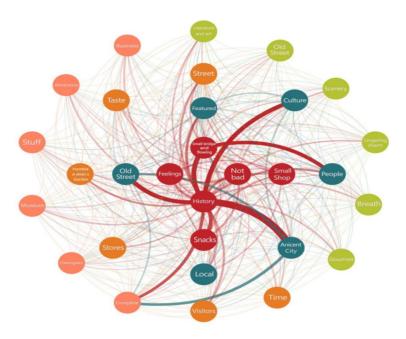
4.2 Co-Linear Network Analysis

Word frequency analysis only reflects the basic situation of tourists' perceptions, however, identifying the intrinsic connections between high-frequency words and the structural relationships between perceptual dimensions has more important research value (Wang Chao, Luo, K.Ren. 2014). Based on the co-occurrence relationship between high-frequency words, this research uses Gephi software to further map the semantic network of visitor perception in Pingjiang historical and cultural district <Figure 3>, and also uses modular algorithm to cluster the semantic relationship between high-frequency words to finally identify the core modules of tourist perception.

In the lexical co-linear network diagram <Figure 3> of the Pingjiang historical and cultural district, there are five subdiagrams included. In the "Attractions" sub-map, Pingjiang, as the epitome of Suzhou's ancient city, attracts many tourists with its water town and beautiful scenery, and tourists are more

concerned about the "integrity" of the historical and cultural district of Pingjiang. The sub-map of "Features, Small Shops" shows the strong literary atmosphere of the Pingjiang Historical and Cultural District. A variety of small stores in the district, such as gourmet snacks, Su-style cheongsam and silk, and Cat's Sky City, are mentioned more often by tourists. At the same time, visitors also compare the Pingjiang historical and cultural district with the Shantang district, which has similar meaning and function, and believe that the characteristics of Shantang district mainly lie in the night view. In the "History" sub-map, in addition to the stories of old neighborhoods and the connotations of historical and cultural streets, most of the common route feature words point to "water culture", i.e. tourists have a strong perception of water and rivers, such as "river" and "water alley". In the "Culture" sub-image, it shows the tourists' perception and feedback on the in-depth experience of Pingjiang historical and cultural district, such as the pattern of ancient streets with pink walls and tiles, the flavor and style of Jiangnan gardens, quiet and cozy teahouses and cafes with atmosphere, etc. It is worth mentioning that the broadcast of the TV series "It's All Good" also attracts some tourists to visit the area. In the "Shops" sub-picture, the water town in the south of the Yangtze River is mixed with the modern commercial atmosphere, which has a special meaning.

In general, the value of Pingjiang Historical and Cultural District as the core area with the most original and complete traditional houses, historical environment and lifestyle in the ancient city of

〈Figure 3〉 Pingjiang Historical and Cultural District Commentary
Vocabulary Common Line Network Map

Suzhou is recognized and acknowledged by tourists, and the double chessboard pattern of "one street and one river" and "parallel water and land" has also left a deep impression on tourists. However, as an important canal distribution center in Jiangnan in the 16th-18th centuries and an ancient grain storage center, the historical value of canal transportation in the Pingjiang Historical and Cultural District has not been highlighted, so tourists' perception of it is relatively weak.

4.3 Analysis of emotional disposition

Tourism emotion is the tourist's intuitive response to the destination tourism experience and has a significant impact on tourist loyalty and satisfaction. The change of tourists' emotion towards destination experience is a dynamic process. A good destination image can satisfy tourists' unique experience of the destination and lead to positive, positive emotions, which in turn leads to re-tour behavior; a negative tourist experience generates negative emotions, which in turn reduces tourists' loyalty and satisfaction with the destination (Suo, Zhihui et al., 2019). The data shows that the number of online comments with positive emotions accounted for 74.86%, while the number of comments with neutral and negative emotions accounted for 13.16% and 11.98%. However, in comparison, analyzing visitors' positive and negative emotions is more helpful to reveal the strengths and weaknesses of the Pingjiang Historical and Cultural District, and the number of comments with positive emotions is 6.25 times

〈Table 3〉 Emotional tendencies of tourists' perceptions in Pingjiang historical and cultural district

Emotional Tendencies	Quantity/strip	Proportion/%	Segment Statistics	Quantity/strip	Proportion/%
Positive Emotions	1075	74.86	General (0 to 10)	383	26.67
			Moderate (10 to 20)	353	24.58
			Height (>20)	339	23.61
Neutral Mood	189	13.16	-	-	-
Negative emotions	172	11.98	General (-10 to 0)	135	9.40
			Moderate (-20 to -10)	29	2.02
			Height (<-20)	8	0.56
Total	1436	100	-	-	-

higher than the number of comments with negative emotions, which fully indicates that tourists perceive it better. It is worth emphasizing that the number of highly positive emotions is low among the online comments with positive emotions, accounting for 23.61%, which indicates that the historical and cultural district of Pingjiang has left a deep and good impression on tourists to be strengthened. The words "Crowded, cramped, noisy, poor water environment" appear in a high proportion of negative emotion texts. The number of online comments collected in this study is relatively sufficient, reflecting to a certain extent the greater awareness and influence of the Pingjiang historical and cultural district, but there is still room for further improvement.

5. Conclusion and Discussion

5.1 Conclusion

Promoting the integrated development of the Grand Canal culture and tourism is the main task and the realization path to accelerate the construction of the Grand Canal Cultural Belt. In-depth understanding and comprehensive assessment of the visitor perception of the Grand Canal heritage can provide an important reference for the preservation, transmission and utilization of Grand Canal culture. This research collects data of tourists' comments in Pingjiang Historical and Cultural District, a Grand Canal heritage site, with the help of Python technology, and conducts analysis of high-frequency words, semantic networks and emotional tendencies based on web text analysis methods to study tourists' perceptions. First of all, the visitors' perception reflects the historical originality and cultural heritage of the Pingjiang historical and cultural district. The historical and cultural district of Pingjiang is characterized by its street form and architectural style, historical relics and celebrity culture, canal scenery and heritage resources, and southern charm and cultural features. At the same time, to further develop the Pingjiang historical and cultural district into a landmark and business card of Suzhou's historical and cultural city,

tourists are looking forward to it. Secondly, there are obvious topic clusters in the tourist perception of Pingjiang historical and cultural district, including colorful natural and humanistic landscape, rich historical and celebrity culture and comprehensive protection and development and utilization.Finally, the vast majority of tourists show positive emotions and hold a better perception of experience in the Pingjiang historical and cultural district. However, the number of highly positive sentiments is low, and there is still potential and space for neighborhood transformation.

Compared with the examination of the main development and utilization perspective, the research of tourists' perception has more important theoretical and practical values, which can truly reflect the development and utilization of the Grand Canal heritage area from the level of market demand. From the above research findings, it can be seen that tourists' perception basically presents the natural landscape and cultural panorama of Pingjiang historical and cultural district, expressing their positive emotions. Pingjiang historical and cultural district is only a microcosm of China's Grand Canal heritage, and further research planning and innovative design are still needed to recreate the transformation of the street landscape and deep excavation of the cultural heritage. Based on this, in order to better protect and utilize the cultural heritage of the Grand Canal and realize the transformation and upgrading of the Pingjiang historical and cultural district, this research proposes the following recommendations.

First, protect the authenticity and integrity of Jiangnan elements. To consolidate the core of Jiangnan imagery, it is necessary to maintain the image and status of the Jiangnan elements of the Grand Canal in the minds of tourists. The principle is to ensure that the authenticity and integrity of heritage resources are not damaged, which is specifically reflected in the protection of natural landscapes. "Outside" and "inside" of the human landscape. On the one hand, to maintain the originality of the elements of Jiangnan, the restoration of the monuments must be based on historical authenticity. On the other hand, it is important to protect not only the heritage resources themselves, but also the "ambience" around them and their integrity.

Second, linkage development with the surrounding related scenic spots. Combined with the surrounding scenic spots such as the Zhuozheng Garden, Lion Grove and Guanqian Street that appear in the analysis of the web text, the author suggests that these spots should be developed in a linked way, i.e. tourists are treating these scenic spots as one in the process of touring. In the promotion of scenic spots, the Pingjiang Historical and Cultural District can interactively promote related scenic spots and include them in the content of the promotion, so as to enhance the impression of these linked scenic spots in tourists' minds, which can effectively expand the breadth of the promotion for tourists. For example, the launch of scenic linkage tourism routes Pingjiang Historical and Cultural District-Zhuozheng Garden, Pingjiang Historical and Cultural District-Lion Forest, Pingjiang Historical and Cultural District-Suzhou Museum, etc.

Third, effective management of negative emotional perceptions.The perceived emotional components of visitors to the Pingjiang historical and cultural district are dominated by positive emotions, while the proportion of neutral and negative emotional components is low. It is important to note that although the proportion of negative emotions is low, the negative impact formed has a significant amplification effect, and destination managers should effectively manage negative tourist perceptions. Among the negative factors in the textual sentiment analysis of tourists in this research, crowded, cramped, noisy, and poor water environment are the main factors that negatively affect tourists' sentiment.In practice, the destination should, firstly, plan the tour trail reasonably and establish a real-time dynamic monitoring system of tourist flow with key landmarks as nodes to reasonably guide the movement of tourist flow and avoid or alleviate the overcrowding phenomenon. Secondly, the rational arrangement of commercial and accommodation areas to reduce the noise impact of tourists' rest. Third, it is to enhance the awareness of water environmental protection among destination tourism enterprises and residents, to implement strict water environmental protection regulations, and to strengthen the construction of water treatment technology facilities as a way to improve the water quality of the Pingjiang Historical and Cultural District.

5.2 Inadequacies

Due to the limitations of the breadth of data collection and the author's own knowledge and ability,

there are still some limitations and shortcomings in this paper, which are as follows. First, in terms of web text collection, due to the limitation of acquiring web review texts from some OTA platforms, only Chinese review texts from Ctrip. Com were collected, without comprehensive comparison and analysis with Chinese data or English data from other travel OTA platforms.Second, in terms of data analysis, there is no clear and accepted way or model for the analysis of web texts, especially for non-numerical parts such as semantic networks or lexical co-linear networks, which needs to be further studied and explored. Third, the sentiment tendency analysis better represents the tourists' perceptions about the Pingjiang historical and cultural district in the sample, but the accuracy is limited and will be compared and further analyzed in future research with the help of LSTM sentiment analysis model and others. Looking forward to more extensive exploration and more in-depth research on online comments in the future, so as to provide a more comprehensive reference for the protection and utilization of the historical and cultural blocks of the Grand Canal and the construction of the Grand Canal Cultural Belt.

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국문요약

네트워크 텍스트 분석을 통한 대운하 문화유산에 대한 관광객 인식 연구 : 쑤저우시 핑장역사문화지구의 예

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본 논문은 쑤저우의 핑장 역사문화 지구을 예로 들어 Python 기술을 적용한 Ctrip.com에서 1436개의 관광객 댓글 데이터를 수집하고, 네트워크 텍스트 분석 방법을 사용하여 빈도 단어, 의미 네트워크 및 감정을 분석하여 대운하 문화의 관광객 인식 특성과 수준을 평가하였다유산.연구 결과: 평강역사문화지구 관광객들의 인식에 자연인문경관, 역사문화축적, 강남운하 풍경이 잘 나타나 있다 ; 관광객들은 평강로 역사문화지구에 대해 비교적 긍정적인 감정을 가지고 있지만, 지구의 개조와 개선은 여전히 큰 여지가 있다.마지막으로 보호우선, 문화통합, 혁신적 활용 등의 측면에서 대운하 문화유산에 대한 관광객의 인식을 높이기 위한 대책을 제시했다.

주제어 : 네트워크 텍스트, 대운하, 문화유산, 관광객 감지, 역사문화 지구

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