Study on Satisfaction of the Historic District Macao with the Difference of Tourist Expectations Under Digital Information

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Abstract. Due to the extensive and uneven network of tourism information digital, the gap between tourist expectations and satisfaction are affected by various factors. This paper investigates the difference in expectations and satisfaction of tourists in the historical city of Macao under the network digital information, and comprehensively uses the expectation difference model, customer satisfaction theory, questionnaire survey, field interview, and SPSS mathematical statistics. This study is to helps identify the inadequacies of Macao's historic districts, provides references and explanations for decision-makers, promotes the development of Macao's tourism industry, and improves the economic benefits brought by tourism. The data in this paper is based on a sample survey of 300 tourists who went to the historical city of Macao through Internet information. The results of the study revealed that tourists' expectations of the historic city of Macau were lower than expected, and their satisfaction with the supporting facilities for tourism consumption was slightly lower. Through the establishment of the expectation difference model, the analysis shows that "service attitude and skill of tourism practitioners" is the main reason affecting tourism satisfaction on the scale of expectation and satisfaction.

Keywords. Visitor Expectation Difference, Satisfaction, Digital Information, Macao Historic City District

1. Introduction

This paper aims to test the view that most people have the idea of traveling through the sharing and recommendation of online media and browsing and retrieving information about their travel destinations through the Internet [1]. Then, to further develop this argument, network publicity will affect tourists' travel experience to a certain extent, in which the itinerary of the travel location, consumption supporting facilities, and cultural tourism environment becomes particularly important. This paper examines this concept through a survey of 300 respondents who visited the historic city of Macau. This paper will discuss the expectation and satisfaction of tourists through Internet tourism promotion. It will examine the characteristics and determinants of visitor satisfaction in the historic city of Macau. In this paper, a brief historical review of the development of online tourism information in the historic city of Macau is conducted, followed by a

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literature review of expectation difference and satisfaction, an overview of the research and its importance evaluation methods, and then the research results are described and discussed.

1.1. Research background

With the continuous improvement of living standards and social productivity, more and more people choose to travel as a way of leisure and entertainment. The advent of the information age also promotes the development of tourism information technology, enhances the publicity of tourism information, and enables people to have more choices of tourist destinations[1]. A large part of people, through the sharing and recommendation of the Internet media, stimulated the idea of travel, and more and more tourists began to browse and retrieve their ideal travel destination information through the Internet. There is a huge amount of tourism information on the Internet, and the true degree of publicity pictures, text, and other information is uneven. There is a large gap between tourism publicity information and the real site, which may greatly lead to a gap in tourists' expectations, thus affecting tourists' travel experience. And have a negative impact on the evaluation of the tourist destination[2].

As a city that has preserved a variety of cultural heritage and improved tourist facilities, Macau is also one of the tourist destinations that many tourists will choose. Among them, the Historic District of Macau is one of the famous tourist routes in Macau, covering many historical buildings and cultural heritage [3]. As a material existence with time continuity, spatial integrity, and traditional features, the historic urban area is the carrier of citizens' life and an important part of historical and cultural heritage [4].

The development of tourism information technology makes Macao, a city with a developed tourism industry, have to accept the test of "whether there is a big gap between tourism publicity information and the real site," which affects the overall evaluation of Macau tourism and tourists' satisfaction. However, the study on the impact of tourist expectation differences on the satisfaction of Macau's historic urban areas has not been conducted deeply [3]. Therefore, this paper attempts to study the impact of tourists' expectation difference on the satisfaction of Macau's historic urban areas based on the expectation difference model. By analyzing the expectation difference through IPA, this paper hopes to help Macao's historic districts find the aspects that have not yet been improved, provide some references and explanations for decision-makers to improve decision-making, improve service quality control and tourists' satisfaction, and promote the development of Macau's tourism industry. Improve the economic benefits brought by tourism.

1.2. Research purpose

The purpose of this study is as follows:
 1. To establish the expectation difference model as a study of tourists' satisfaction with the historical city of Macao;
 2. Summarize the influence factors of tourism promotion expectation on the satisfaction difference of Macao's historical urban areas, and discuss the differences among the influence factors to clarify the achievements of each influence factor in which aspects deserve recognition and which aspects need further improvement and upgrading;
 3. Based on the research results, this paper studies the historical urban area of Macao and the satisfaction of tourists' expectations and puts forward relevant feasible

suggestions for the development of the historical urban area of Macao in combination with the current status of tourism development in Macao.

2. Literature review

2.1. Expecting Differences Theory

In the 1980s, the research focus of Western marketing scholars and consumer acting scholars turned to consumers with service quality and satisfaction as the core of consumers. The better the service quality the customer perceives, the higher the satisfaction of the customer, so most scholars regard service quality and customer satisfaction as one thing. There are at least nine theories on satisfaction based on OH & Parks' (1997) literature research. Among them, the earliest expectations of the expected differences proposed by Oliver (1980) are generally commonly used due to simple and extensive applicability due to simple and extensive applicability. Acceptance and application.

Expecting differences in the study of consumer satisfaction in the retail service industry. According to this theoretical consumer preliminary expectation of consumption of certain products or services [6], after the consumer activity is over, consumers will compare the perception performance and pre-consumer expectations. If the two are inconsistent, there will be differences between the two. Positive differences mean that the performance is higher than expected, and consumers will be very satisfied at this time. The negative difference means that the performance is lower than expectations, and consumers will feel disappointed [7].

Woodruff et al. were studied earlier in the models involved in the model, and the expectations should be divided into three categories:
1. The expectations of the best products or service performance of similar products;
2. Expectation of general products or service performance;
3. Expectation of normal performance of a business or service.

Many scholars at home and abroad believe that customers expect to directly affect customer satisfaction. Some scholars believe that there is a negative relationship between the two, while others believe that there is a positive relationship between the two [2]. Wang Chunxiao pointed out through empirical research that customer expectations do not directly affect customer satisfaction but instead indirectly affect customer satisfaction through the product and service performance of customers [8].

It is expected that the difference model will be widely used in various service industries. The research on service quality and customer satisfaction in tourism mainly includes scenic spots, hotels, restaurants, casinos, etc. [2]. In general, there is relatively much research. The connotation of such service products is relatively single. The research policy for the customer satisfaction of tourism companies mostly uses the SERVQUAL meter. Research on the performance and expectations of customers through questionnaire surveys.

In 2006, the Australian Hughes[9] proposed the relative nature of the concept of satisfaction and believed that tourists should be satisfied by the community on three different levels, namely: very satisfied, very satisfied, and satisfied. This statement has more accurate the research level of tourist satisfaction and contributes to the accurate measurement of tourist satisfaction. Summarize the perception of tourists' perception of

the schedule. This model can be expressed as s = p - e (s indicates the evaluation score, P means perception of real performance, and e indicates the expected value.)[2].

2.2. Tourist Satisfaction

Tourist satisfaction is a perception and summary of tourists after the tourist activity is over. It includes the communication and transmission of various information between the tourism subject and the object. There are several types:

In 1978, Professor Abraham Pizam (Petkova & Organisation for Economic Co-Operation and Development (1978) was satisfied with the satisfaction of Cape COD, Barnstable, southern Barnstable, Massachusetts, USA. In empirical research, it was found that the constituent elements satisfactory for tourists include eight factors, including beaches, recreation opportunities, costs, customer degrees, accommodation facilities, catering facilities, environment, and commercialization [10]. This statement has certain regional limitations, but at that time, the degree of impact of the factor was also a reflection of progress. Chen Li [11] believes that customers expect to be the standard for customer satisfaction evaluation, and customers' expectations for products and services will directly affect customer satisfaction. Xie Yanjun made the following summary of tourists' expectations, tourist experience, and satisfaction with tourists [12].

Lin Xiaosen analyzed the current status of China's tourism industry and analyzed from the perspective of tourist satisfaction that tourists' satisfaction was mainly affected by tourists [14]. According to the literature, tourists' psychological feelings about the tourism environment and tourism products that is tourist satisfaction. Wang Zhengbin and Zhao Yi [15] believe that the tourism industry is a comprehensive industry involving all aspects, such as eating, living, traveling, traveling, purchasing, and entertainment. Cao Xia [16] and others believe that tourists are satisfied with the source of competitiveness in the tourism market, and they are the fundamental driving force for stable large-scale tourists. , Catering, Entertainment, Ticket Price, Guide's Explanation Service 9 elements. At the same time, Lin Xiaosen [14] believes that the object status during the entire process of tourism is the key to tourists satisfaction, including tourist experience, travel agency services, shopping, accommodation quality, and service during the process, Supporting facilities of tourist destinations (the overall environment, public labeling, language communication, barrier-free facilities, etc.). Ragavan and Valduga et al. [17] by evaluating various destination attributes (such as accommodation, food, attractions, images, products, availability, culture, community, and price) and other attractions as an important part of tourist destinations. It evaluates the views and satisfaction of tourists on tourist destinations.

2.3. Visitors Satisfaction System and Evaluation Model Method Research

Our country on tourist satisfaction assessment index system construction and assessment model methodology research is gradually mature, Chen Li [11] with a survey questionnaire method of Nanjing Zhongshan mausoleum scenery area tourists satisfied with the effect of the emotion of the evaluation. Zhou Nianqing [18] uses questionnaires and uses SPSS software to take the Wu Lingyuan HuangShizhai Scenic Area as an example. The satisfaction model of tourist psychological capacity has been introduced. Wang Xia, Lian Yi [19] based on Professor Fermal's customer satisfaction index theory of the University of Michigan in the United States, used the questionnaire to study the satisfaction of tourists in Guilin City. (Tourism Destination Customer Satisfaction

Index.)TDCSI. An evaluation indicator system for tourist satisfaction with tourist destinations has been conducted. Liu Jun, Ma Fenghua [2]. The expectation differential models have studied the satisfaction of tourists in Guangzhou Pedestrian Street. Expectation, so most tourists will not have re-travel or recommendation. In 3005, Dong Guanzhi, Yang Fengying [13], When analyzing the service process of the tourist attraction, proposed an important factor affecting the satisfaction of tourists in the scenic spot, and on this basis system. Pan Liping[20] surveyed tourist influencing factors for tourists and used the theory and hierarchical analysis of mathematics to analyze and evaluate the results of the survey to analyze the satisfaction of tourist planning. Shao Weiqin [21] puts the life cycle of a tourist destination, the degree of development of a tourist destination, the proportion of leisure tourism products in tourist destinations, and the tourist destination tourist perception. Visitors are satisfied and loyal models. Nan Jianfei, Zhao Lili [22] established a tourist scenic spot satisfaction evaluation system with comprehensive tourist scenic spots, tourism service quality, quality of tourism practitioners, and tourist scenic spots as the main influencing factors. Xiao Zhaoxia [23] intended to study the satisfaction of the Shangri -La Bita Ecological Tourism Area in the form of a questionnaire and analyzed the results of the survey. And service quality. Wang Qun [24] and other six aspects of tourist satisfaction index evaluation system models, including tourist perception, tourist expectations, tourist value, tourist satisfaction, tourist loyalty, tourist complaints, etc. And using the sub-system to analyze the satisfaction of tourists in the Huangshan Scenic Area. Wu Langui, Ren Lixiu, and Xie Wen [25] built the tourist satisfaction theory model based on the perception model and based on the research object of the Nanjing Zhongshan Cemetery Scenic Area. The analysis method of the gray system model evaluated the satisfaction of tourists and pointed out the current status of not high tourists in the Zhongshan Cemetery Scenic Area and put forward measures to improve improvement. Guo Yan, Xie Lining, and Zhao Liqin [26] three of them proposed three ways to improve tourists'' travel satisfaction based on the theoretical basis of the service profit chain.

Regarding how to evaluate the satisfaction of tourists, the most scientific way is to combine quantitative and qualitative because tourist satisfaction is a comprehensive manifestation of various factors in the psychology of tourists. Therefore, tourist satisfaction involves single satisfaction and comprehensive satisfaction.

At present, there are mainly three quantitative evaluation methods for the evaluation of tourist satisfaction at home and abroad: Servperf (service performance), Servqual (service quality), and Importance-Performance Analysis (importance-performance analysis).

3. Methods

Tourists'' expectation of the destination is a degree of aspiration for the overall experience of the destination before the tourists arrive at the destination, and this expectation is related to the personal characteristics of the tourists and the degree of understanding of the information related to the destination, the understanding of the preferences, and the way of understanding, etc. The motivation of the tourists is influenced by the behavioral characteristics of the tourists and the dissemination of information related to the destination. The motivation of tourists is influenced by their behavioral characteristics and the dissemination of information about the destination, etc. Individuals have different expectations of the travel experience, which triggers the

individual behavior of tourists. Then, due to the influence of environmental characteristics and activity experiences, there are different tourism experiences, which finally affect the satisfaction and subsequent behaviors of tourists. Based on the theory and the purpose of this paper as well as the collation of related literature, the following research questions and research hypotheses are proposed:

H1: Tourist satisfaction is affected by the gap between their pre-trip expectations of Macau's tourism values and services and their actual perceptions after the trip. If the actual perceptions exceed their pre-trip expectations, the tourists are satisfied; otherwise, they are dissatisfied.

H2: Tourists'' predictions before arriving at their destinations may be incomplete due to the influence of travel agencies'' promotions, TV and online media publicity, as well as relatives' and friends'' previous travel experiences. Therefore, this study will focus on tourists'' travel to Macau through information on web pages and social media to compare the information on Macau's online platforms with tourists'' actual feelings.

H3: In this paper, tourists'' expectations and satisfaction were measured from the evaluation factors of three aspects of services in Macau. Tourists'' overall satisfaction was categorized into three aspects: the humanistic tourism environment of the historical city, the supporting services for tourism consumption, and the auxiliary services for obtaining tourist information.

According to the model of satisfaction of tourists'' expectation difference in the Historic Centre of Macao, specific service projects in the three service stages of pre-tourism service, in-tourism service, and post-tourism service of tourists traveling to Macao were selected and combined with the literature review and the National Tourism Administration's "〝Tourist Sampling Survey Data, "〞 the influencing factors of tourists'' expectation and satisfaction were summarized into three aspects: humanistic tourism environment of the Historic Centre of Macao, ancillary services of tourism consumption, and access to information of sightseeing. The first level is the overall objective.

The first level is the overall objective, i.e., the overall satisfaction level of inbound tourists.

The second level is the first level of indicators based on the decomposition of the target level, which includes the following three indicators: humanistic tourism environment in the historic city, supporting services for tourism consumption, and auxiliary services for obtaining information on tours;

The third level is the second level of indicators, which is the second level of satisfaction indicators that can be directly measured after the breakdown of the first level of indicators, focusing on the characteristics of Macao's tourism resources and environment. A total of 15 evaluation factors were designed for the second level of indicators, and these 15 factors were directly transformed into questions in the tourist survey. From this, we can initially establish a system of indicators for evaluating tourists'' expectation-satisfaction with the Historic Centre of Macao.

Through a review of the literature, it was possible to identify three main dimensions related to the interrelationship between expectations and tourist satisfaction, which include several factors. After defining possible variables to measure the behavior of these three dimensions, a questionnaire was designed. Through a review of the literature, it was possible to identify three main dimensions related to the interrelationship between expectations and tourist satisfaction, which include several factors. After defining possible variables to measure the behavior of these three dimensions, a questionnaire was designed. To obtain more accurate information, in the past, Macau tourists

conducted random drawing samples to investigate the objects. We distributed questionnaires in the historic districts of Macau, mainly covering St Paul (the Ruins of the Cathedral of Saint Paul), the Municipal Services Department, the A-Ma Temple, and these historic buildings. Most of the investigation was performed within the rest time of tourists after tourists to ensure that the tourists expressed real feelings about the play and adopted a one-to-one inquiry method to use it to use a one -to -one way of inquiry. Ensure the accuracy and authenticity of the data. The questionnaires were collected and completed by on-site questionnaires and electronic questionnaires on April 22, 23, and 24. A total of 300 questionnaires and 300 questionnaires were distributed in this survey, of which 245 were effective questionnaires, and the effective rate was 81.67%. The questionnaire is divided into several sections. After initially distinguishing between tourists and residents, the first part collects the channels through which tourists visit and understand Macau and screens out the people who use online information media.

4. Results

After an initial presentation of the participants'' academic and socio-economic characteristics, the results were weighted so that male and female answers were equally relevant, and the results were organized according to the three dimensions identified. Finally, exploratory factor analysis was conducted to distill possible explanations for some of the observed behaviors and attitudes (Table 1).

Table 1. Tourist Sample Structure of Historic Centre of Macao.

		sample size(n)	percent （%）
Sex gender	Male	129	43
	Female	171	57
age	Under 15 years	0	0
	15-24 years	140	57.14
	25-34 years	81	33.06
	35-44 years	10	4.08
	45-54 years	13	5.31
	55years and over	1	0.41
educational attainment	Junior high school and below	2	0.82
	High school/secondary school	16	6.53
	Bachelor's degree/tertiary	136	55.51
	Master's degree or above	91	37.14
income level	No income	82	33.47
	Less than 3000 CNY	22	8.98
	3,001-5,000 CNY	47	19.18
	5001-10000 CNY	55	22.45
	More than 10,000CNY	39	15.92
information channel	Relatives and friends	107	43.67
	Web forum	76	31.02
	Social media software	155	63.27
	Newspapers/books	27	11.02
	others	57	23.27
Playing time	1 day	28	11.443
	2-3 days	103	42.04
	4-7 days	20	8.16
	longer time	94	38.37

By analyzing the survey questionnaire on the overall expectation of tourists, we concluded that 44.49% of the total number of surveyed tourists in the Historic Centre of Macao felt very important, 42.45% felt important, 11.43% felt average, 0.82% felt unimportant, and 0.82% felt very unimportant. Those who felt very unimportant accounted for 0.82% of the total number of tourists surveyed. It can be seen that most of the tourists' expectation of Macau tourism lies between very important and important.

The reliability and validity of this study questionnaire survey use SPSS26.0 statistical software and the Cronbach coefficient to test. This article conducts a trustworthy inspection of the total satisfaction and importance of the questionnaire survey, as well as the satisfaction and importance of the satisfaction and importance of three dimensions. According to the results of the experiment, the values of total importance alpha series and meaning degree alpha series are 0.949 and 0.963, respectively (Table 2). Under the three dimensions, the values of α series and α series of the importance of the tourism environment in historical cities are 0.871 and 0.899, respectively, and that of supporting services of hotels are 0899 and 0.925, respectively. The values of the importance alpha series and concept alpha series of tourist itineraries are 0.91 and 0.876, respectively (Table 3). The number of variables is greater than 0.7, so it can be considered that the reliability of this paper is high.

Table 2. Total Reliability Test.

	Cronbach's Alpha	number of items
importance	0.949	15
satisfaction	0.963	15

Table 3. Reliability test under dimensionality.

importance		satisfaction	
Cronbach's Alpha	number of items	Cronbach's Alpha	number of items
0.871	5	0.899	5
0.899	6	0.925	6
0.910	4	0.876	4

Before making a factor analysis of the various factors in the historical city of Macao, first of all, To Kaiser-Meyer-Elkin the total and Bartlett sphericity test (Bartlett's test of sphericity) to check whether these options in the paper are suitable for factor analysis.

Table 4. Factor-specific KMO and Bart1ett's test.

KMO Measure of Sampling Adequacy		0.935
Bartlett's Test of Sphericity	myopia chi square	4553.326
	degrees of freedom	435
	significance	0

As can be seen in Table 4, the KMO value is 0.935, and the Bartlett check value is 0.000 (less than 0.05), indicating that the correlation moment of the data is not a unit moment and there is a correlation between the data, so it is considered that factor analysis can be performed. Through the analysis of the proportion of the common factor of the scale, it is found that the amount of information extracted by the common factor is the largest, reaching 0.838, and that of "Portuguese culture" is the smallest, at 0.606. The number of public factors for the extraction of their indicators is between these two; we

can know that before the number of factors, the extraction of as high as 15 indicators is still satisfactory (Table 5).

Table 5. Common factor variance table.

common factor variance

	starting	extract
Geographical characteristics of tourism resources	1.000	0.768
Resource diversity in the tourism region	1.000	0.724
Portuguese Culture	1.000	0.606
Environment for the integration of Chinese and foreign cultures	1.000	0.710
consumer environment	1.000	0.608
Attractions and travel agency industry	1.000	0.656
Tourism Catering	1.000	0.808
Tourist accommodation	1.000	0.722
Tourism and transportation	1.000	0.680
Travel Shopping	1.000	0.712
Tourism Festivals and Events	1.000	0.670
Tourism public and basic guide signs	1.000	0.748
Intelligent Trip Planning	1.000	0.792
Service Attitude and Skills of Tourism Employees	1.000	0.838
immigration service	1.000	0.790

Extraction method: principal component analysis.

Table 6. Total Variance Explained by Common Factors.

total variance explained

ingredient	Initial eigenvalue			Extract the sum of the squares of the loads			Rotational load sum of squares		
	total	Percentage of variance	Cumulative %	total	Percentage of variance	Cumulative e %	total	Percentage of variance	Cumulative %
1	8.850	58.997	58.997	8.850	58.997	59	3.718	24.787	24.787
2	1.049	6.991	65.988	1.049	6.991	6.99	3.689	24.595	49.382
3	0.933	6.221	72.209	0.933	6.221	6.22	3.424	22.827	72.209
4	0.728	4.856	77.065						
5	0.544	3.628	80.693						
6	0.489	3.259	83.951						
7	0.420	2.799	86.750						
8	0.391	2.610	89.360						
9	0.320	2.137	91.497						
10	0.309	2.059	93.555						
11	0.263	1.751	95.306						
12	0.233	1.556	96.862						
13	0.185	1.235	98.097						
14	0.165	1.098	99.195						
15	0.121	0.805	100.000						

Extraction method: principal

Table 7. Rotated factor loading matrix.

Rotated component matrix [a]			
	ingredient		
	1	2	3
Geographical characteristics of tourism resources			0.778
Resource diversity in the tourism region			0.739
Portuguese Culture			0.690
Environment for the integration of Chinese and foreign cultures			0.716
consumer environment		0.572	
Attractions and travel agency industry		0.697	
Tourism Catering		0.769	
Tourist accommodation		0.716	
Tourism and transportation		0.672	
Travel Shopping		0.616	
Tourism Festivals and Events	0.548		
Tourism public and basic guide signs	0.705		
Intelligent Trip Planning	0.803		
Service Attitude and Skills of Tourism Employees	0.828		
immigration service	0.731		

Extraction method: principal component analysis.
Rotation method: kaiser normalized maximum variance method.

This factor analysis adopts the method of principal component analysis to extract the total variance of common factors. Since the eigenvalue must be greater than 1 to be extracted, in this study, due to the number extracted from the literature review theory, the simultaneous variance solution is 0.933, and the cumulant variance solution is 72%. Three principal components can be extracted as appropriate.

It can be seen from Table 7 that the load of each factor in the 15 indicators is greater than 0.5, and the most significant factor is the three principal components. The total variance of the cumulative solution is 72.209%, and the value of the meaning index alpha is 0.925. And the values of the alpha series in the interior of the three principal components are all greater than 0.8, so the credibility is high. The number of public factors obtained in this study is named as follows:

F1: including the regional characteristics of tourism resources, tourism regional resources diversity, Portuguese culture, Chinese and foreign cultural integration of the environment, named "historical city cultural tourism environment";

F2: including the consumption environment, scenic areas and travel agencies, travel, hotel and accommodation, tourism, transportation, tourism, and tourism six indicators, named "supporting facilities for tourism and tourism."

F3: It includes five guidelines, including daily travel activities, travel public and basic guidelines, intelligent itinerary planning, service level and skills of tour operators,

and immigration services, which are named "information acquisition assistance services."

Table 8. Expectation and Satisfaction Indicators Paired Sample Degree of Difference and T-Value Tests.

| dimension	satisfaction（P）		expected value（I）		（P-I）	T-value	P-value
	average value	sequence	average value	sequence			
Geographical characteristics of tourism resources	4.184	1	4.288	3	-0.104	-1.929	0.056
Resource diversity in the tourism region	4.160	3	4.288	3	-0.129	-2.179	0.030*
Portuguese Culture	4.012	13	4.080	14	-0.067	-1.224	0.222
Environment for the integration of Chinese and foreign cultures	4.129	5	4.264	6	-0.135	-2.679	0.008*
consumer environment	4.123	6	4.196	12	-0.074	-1.297	0.196
Attractions and travel agency industry	4.098	9	4.233	9	-0.135	-2.436	0.016*
Tourism Catering	4.104	8	4.319	1	-0.215	-3.648	0.000*
Tourist accommodation	4.117	7	4.313	2	-0.196	-3.446	0.000*
Tourism and transportation	3.908	15	4.067	15	-0.160	-2.568	0.011*
Travel Shopping	4.098	9	4.239	8	-0.141	-2.707	0.008*
Tourism Festivals and Events	4.135	4	4.288	3	-0.153	-3.240	0.001*
Tourism public and basic guide signs	4.074	11	4.202	11	-0.129	-2.280	0.024*
Intelligent Trip Planning Service	3.914	14	4.178	13	-0.264	-4.021	0.000*
Attitude and Skills of Tourism Employees	4.043	12	4.245	7	-0.202	-3.671	0.000*
immigration service	4.166	2	4.233	9	-0.067	-1.308	0.193

In terms of importance, customers regard all indicators in historical cities as more important, among which the importance of tourism, catering, accommodation, regional characteristics of tourism resources, diversity of resources, and daily activities of tourism is high. However, the importance of other indicators such as tourism transportation,

Portuguese culture, intelligent itinerary planning, consumer environment, and tourism public and basic guidelines are relatively low. In terms of satisfaction, compared with other indicators, such as the regional characteristics of tourism resources, entry, and exit services, the diversity of tourism resources, daily activities, and so on, compared with other indicators. On the other hand, customers have a low degree of satisfaction in terms of travel and transportation, intelligent itinerary planning, Portuguese culture and service, and skills of travel and tourist staff. In contrast, the Macao historical city tour needs to improve the items with low customer satisfaction (Table 8).

The matching T-check is used to check whether it comes from a positive total with the same mean, and 95% of the confidence interval is taken at the same time, that is, whether there is a significant difference in the mean of the two matching versions. Through the analysis, it can be found that among the 15 indicators, only the regional characteristics of tourist resources, Portuguese culture, consumer environment, and immigration services are more than 0.05. in other words, except for these four items, there are significant differences in customer tests, so it is necessary to do further IPA analysis to understand the differences between these projects (Table 8).

In this paper, according to the 15 shadow factors of customer expectation, the IPA box is made according to the location where they appear. Due to the inconsistency between the scale of the seat and the seat, the quadrant of the plan is only corresponding to each other, and the value ratio is not equal to that of the seat (Table 9).

Table 9. Expectation - Satisfaction Chart.
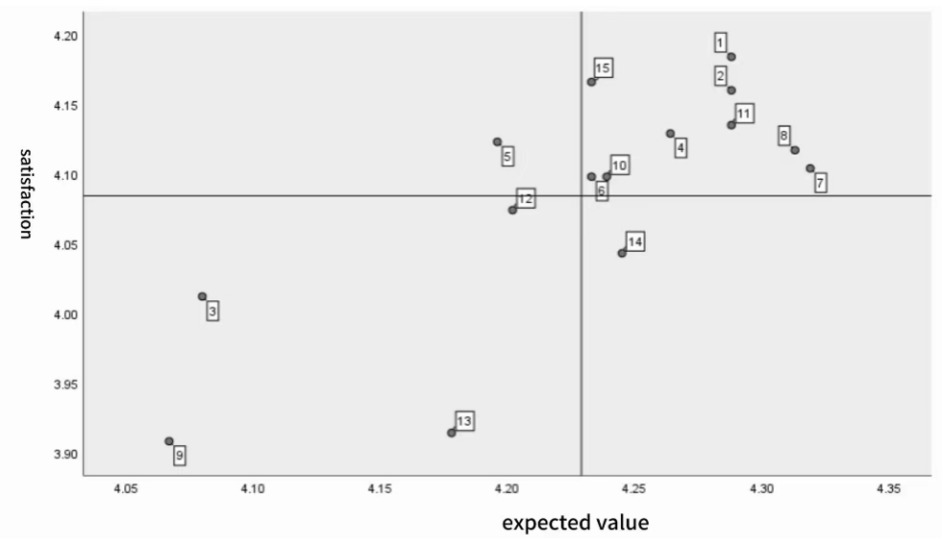
1, regional characteristics of tourism resources 2, resource diversity of tourism region 3, Portuguese culture 4, Chinese and foreign cultural integration environment 5, consumer environment 6, scenic spots and travel agencies 7, travel and catering 8, hotel accommodation 9, travel and transportation 10, travel 11, daily activities 12, travel public and basic guidelines 13, smart itinerary planning 14, service and skills of travelers 15, immigration services

It can be seen from the above table that the projects that need to be maintained and developed include the regional characteristics of tourism and tourism resources, the diversity of resources in the tourism and tourism region, the environment of cultural

integration between China and foreign countries, scenic spots and travel agencies, travel, catering, accommodation, travel and transportation, daily activities and entry and exit services. These points have played an important role in the future development of the historic city area of Macao, and these projects should be maintained to enhance the satisfaction of tourists in the historic city area. At the same time, we need to make great efforts to maintain the environment. On the other hand, the secondary improvement project includes Portuguese culture, travel and transportation, public and basic travel guidelines, and intellectual itinerary planning.

5. Conclusion

Based on the IPA analysis of 15 test factors, the priority order that should be integrated and improved in the historical city area of Macao is obtained. The key projects that need to be improved are the service skills and skills of travel professionals, followed by Portuguese culture, travel and transportation, public and basic guidelines, and intelligent itinerary planning.

In the survey, it was found that most of the visitors from other places were attracted to Macao by the positive publicity of social media or the Internet. This positive publicity function is a strong impetus for the sustainable development of the tourism industry, but it will also create a threat. For example, visitors spend a lot of time playing, but the experience is lower than expected. This will have a more serious impact on the reputation of Macao's tourism industry. The results of the survey show that most visitors' perception of Macao's historical street area is lower than expected, and visitors generally produce a feeling that they are "not as good as they imagined." it shows that there is a certain gap between the actual tourism environment of the historical city area of Macao and the promotion of online media. This provides a warning for the managers of Macao's Fushi Street District, and they will then be able to make positive improvements based on the results of the survey. Therefore, we need to focus on improving the service and skills of tourism employees, followed by the Portuguese culture, transport, public and basic guidelines, and intelligent itinerary planning aspects. The gap between the expectations of small tourists before and after travel so that the reality of Macao's historical street area is in line with the promotion of Internet media tourism, which will play a very important role in promoting the growth of Macao's tourism industry and improving the economic benefits of Macao's tourism industry.

From the above results, it is clear that in the management of historic urban areas in the past, managers need to focus on the service level and skills of travel professionals, the protection of traditional culture, and the construction of basic infrastructures. We will strengthen the construction of the service environment, the physical and psychological configuration of the rich industry, the improvement of the level of service products, and the management of special organizations and institutions in historic urban areas. At the same time, according to the national basic method, historical urban areas are required to raise the level of managers and service personnel based on standardized customer satisfaction. Secondly, the historical street area of Macao has a strong tourist attraction, which makes countless visitors fascinated by its unique historical property and culture, and serving as a commercial street is the symbol of the city's image. Therefore, the city area should protect the authenticity of historical culture, historical materials, and

historical culture and develop folk customs and traditional culture in the form of life displays and interactive culture.

The first innovation of this study is that the research angle is new. It studies the tourism environment of Macao's historic city from the perspective of visitors' expectations and satisfaction and enriches the research methods and means of tourism in Macao's historic city. Second, a system has been established to measure the degree of customer satisfaction in the historical city of Macao. The third is the empirical study on the historical city of Macao, which makes a comprehensive study of customer satisfaction, and puts forward suggestions based on the results of the study to provide relevant decisions and references for managers. The fourth is to "use the expectation difference model to study the Macao brigade," which further enriches the research method of the Macao brigade.

Due to the limitations of the region and time of the survey, only traditional Chinese is used in the questionnaire, and there is a lack of investigation and interpretation of the feelings of foreign visitors to Australia. At the same time, in the study, we only focus on the analysis of overall customer satisfaction. To obtain a more accurate conclusion, it is possible to test the overall satisfaction of different customer groups in future studies.

References

[1]   Zhang, Lingyun; and Lai, Managing, "The Basic Concept and Theoretical System of Intelligent Tourism," *Journal of Tourism*, no. 05 vo 27, pp. 66–73, 2012.

[2]   Liu Jun, Ma Fenghua, and Miao Xueling, "A Study on Customer Satisfaction in RBD Based on Expectation Difference Model--Taking Beijing Road Pedestrian Business District in Guangzhou City as an Example," *Journal of Tourism*, no. 05, pp. 14–19, 2004.

[3]   Wu Qi, "Study on the Conservation and Revitalization Mechanism of Macao's Old Urban Areas from the Perspective of Property Rights," 2017.

[4]   Liu Minshi, "Study on Public Participation in Urban Renewal in Macau," 2020.

[5]   Liu Chengkun; and Li Jingyang;, "Research on sustainable development path of smart city construction in Macao," *Urban management* and technology, no. 05 vo 22, pp. 74–76, 2021.

[6]   E. W. Anderson, "Customer Satisfaction, Market Share, and Profitability: Findings from Sweden," Journal of Marketing, vol. 58, no. 3, pp. 53–66, Jul. 1994, doi: 10.1177/002224299405800304.

[7]   I. Vardopoulos, "Industrial building adaptive reuse for museum. Factors affecting visitors' perceptions of the sustainable urban development potential," Building and Environment, vol. 222, p. 109391, Aug. 2022, doi: 10.1016/j.buildenv.2022.109391.

[8]   Wang Chunxiao and Xie Lishan, "Overall quality management in service companies," Guangdong economy, no. 05, pp. 36–37, 1994.

[9]   H. K. Hughes, E. Mills Ko, D. Rose, and P. Ashwood, "Immune Dysfunction and Autoimmunity as Pathological Mechanisms in Autism Spectrum Disorders," Front. Cell. Neurosci., vol. 12, p. 405, Nov. 2018, doi: 10.3389/fncel.2018.00405.

[10] A. Pizam, Y. Neumann, and A. Reichel, "Dimentions of tourist satisfaction with a destination area," Annals of Tourism Research, vol. 5, no. 3, pp. 314–322, Jul. 1978, doi: 10.1016/0160-7383(78)90115-9.

[11] Chen Li, "Research on Tourist Experience in Tourist Attractions," 2003.

[12] Xie Yanjun;, "Tourism Theory Research and Disciplinary Self-Consciousness," Journal of Beijing International Studies University (BISU), no. 01 vo 32, pp. 8–15, 2010.

[13] Dong Guanzhi and Yang Fengying, "Research on Tourist Satisfaction Measurement System of Tourist Attractions," Journal of Tourism, no. 01, pp. 27–30, 2005.

[14] Lin Xiaosen, "Implications of Customer Satisfaction Research for China's Tourism Industry," Modern Economic Information, no. 23, p. 263+265, 2009.

[15] Wang Zhengbin and Zhao Yi, "Empirical Study on Tourist Satisfaction in Zigong Tourism Based on Factor Analysis," Journal of Leshan Normal University, no. 08, pp. 78–81, 2008.

[16] Cao Xia and Ding Lei, "Evaluation of Tourist Satisfaction in Jiangsu Regional Tourism," Henan Science, no. 01, pp. 161–164, 2007.

[17] I. E. Ragavan, T. Egbelakin, J. Ingham, R. Phipps, J. Rotimi, and O. Filippova, "A performance-based framework to prioritise underutilised historical buildings for adaptive reuse interventions in New Zealand," Sustainable Cities and Society, vol. 48, p. 101547, Jul. 2019, doi: 10.1016/j.scs.2019.101547.

[18] Zhou Nianxin, "Determination of Tourism Psychological Capacity--The Case of Huangshizhai Scenic Spot in Wulingyuan," Geography and Geographic Information Science, no. 02, pp. 102–104, 2003.

[19] Lian Yi and Wang Xia, "Research and Application of Customer Satisfaction Measurement Indicator System in Tourist Destinations," Journal of Tourism, no. 05, pp. 9–13, 2004.

[20] Pan Liping, "Evaluation of Tourism Satisfaction of Traveling Chinese Tourists Based on Fuzzy Comprehensive Judgment.," 2007.

[21] Shao Weiqin, "Model Construction of Tourist Loyalty Mechanism for Tourist Destinations," Tourism Science, no. 03, pp. 44-47+69, 2005.

[22] Nan Jianfei and Zhao Lili, "Research on Measuring Tourist Satisfaction in Tourist Attractions," Modernization of shopping malls, no. 27, pp. 48–49, 2006.

[23] Xiao Zhaoxia and Yang Guihua, "Dynamic Monitoring of Tourist Satisfaction in Ecotourism Scenic Area Management--The Case of Bitahai Scenic Area in Shangri-La," Resource Development and Markets, no. 01, pp. 70–72, 2005.

[24] Wang Qun, Ding Zurong, Zhang Jinhe, and Yang Xingzhu, "An Index Measurement Model of Tourist Satisfaction in Tourism Environment--The Case of Huangshan Scenic Area," Geographical studies, no. 01, pp. 171–181, 2006.

[25] Tu Wei, Ren Lixiu, Wu Langui, and Xie Wen, "Research on Tourist Satisfaction in Mature Tourist Destinations Based on Gray System--The Case of Nanjing Sun Yat-sen Mausoleum Scenic Spot," Journal of Shandong Normal University (Natural Science Edition), no. 03, pp. 88–90, 2006.

[26] Guo Yan, Zhao Liqin, and Xie Lining, "Discussion on Tourist Satisfaction Enhancement Strategies of Tourist Attractions Based on Service Profit Chain Theory," Corporate Vitality, no. 06, pp. 42–43, 2007.