

IPA Study of Turf Maintenance and Management of Golden Gulf Golf Club in Zhuhai City

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Abstract. The study analyzed the importance and performance of the 14 indexes of turf quality from players and 8 indexes from managers and turf management measures in Golden Gulf golf club in Zhuhai City in Summer. Providing suggestions for the way of personnel assignment, cost control, even the club management. The paper came to the following conclusions: The players are satisfied with the five-turf quality indexes of divot, turf elasticity, turf density, turf resilience and grass texture. Therefore, turf managers should maintain the original manpower and material resources for these five indexes. On the other hand, for the players, the three unsatisfactory indexes of coring, fertilizer odor, and green ball speed, which should increase manpower and material resources, and strengthen cooperation with the Caddy Department and the Operations Department to improve it. Beyond that, provide better member services to improve the satisfaction of the players. For the six turf quality indexes of weed control, dew treatment, defoliation cleaning, tee ground stability, light shadow, and grass color, although the players are not satisfied with it, but they also have low valuation for their importance, so that, managers can appropriately reduce manpower and material resources to save management costs.

Keywords: Turf Maintenance; Importance and Performance Analysis; Golden Gulf Golf Club.

1. Introduction

Since golf became an official event of the Rio de Janeiro Olympic Games in 2016, Feng Shanshan won the women's bronze medal bravely, triggering a golf boom in China, and the development of golf in China has entered a new historical stage [1]. With the upgrading of consumption, golf clubs begin to pay more attention to their own service quality. Golf course as the core facilities of the club, the quality of the course directly affects the core competitiveness of the club and its attraction to the market. The turf is the most important product, the quality of the turf of a golf club is better than that of other courses, which means that the club gets competitive advantage in the market. In the current increasingly competitive situation, one of the important factors for consumers to choose the club is the quality of the turf [2]. The key factors in golf club management, such as target market positioning, service quality and turf quality, are closely related to consumers. Therefore, the study of club service quality, customer satisfaction and other related issues is very important for business decision-making. For the current golf market, consumer satisfaction with turf quality is the key to the long-term survival of the golf club.

Based on the analysis of turf quality and maintenance measures of Golden Gulf golf club in Zhuhai city, this paper has acquaintance the degree of consumers' perception of importance and performance of 14 turf quality indexes. IPA is carried out in combination with the perception of turf managers on the importance and performance of 8 turf quality indexes, and the deficiencies in management are found out. Put forward the management advice which cannot only satisfy the consumers but also save the cost of manpower and material resources.

2. Literature Review

IPA, Importance-Performance Analysis, evaluates the satisfaction of consumers by measuring their perception of the importance of service quality and the actual performances of service quality [1, 3]. IPA can be used to evaluate government services [4], tourist destination satisfaction [5] and hotel services [6,7]. In recent years, IPA method has been continuously improved by academia, and

has been widely used in rural tourism [8], hot spring service [9] and other reception service industry as an ideal satisfaction assessment tool. Bao Yafang and others used IPA to evaluate the satisfaction degree of Linan tourists in tourism and shopping [10]. Yang Jie investigated the situation of Xujiahui district as a business tourism destination in Shanghai [11], and applied IPA in the result research. Wu Jingfei studied the IPA of the service quality of China's economy hotels, focused on the issues concerned by the managers of economy hotels, and used IPA to give suggestions on the improvement of the service quality of China's economy hotels [12].

No matter other reception services or golf industry, the service quality in China still lags behind that of European and American countries, and the training of personnel and the use of relevant management tools and facilities are also lagging behind. As a systematic science, turf management has not accumulated enough management technology and consciousness since golf project entered China for only 40 years. It often costs a lot of manpower and material resources, but has not achieved satisfactory turf quality. Referring to the advanced study tools of European and American developed countries on service quality and customer satisfaction, IPA is helpful for Chinese golf clubs to realize more scientifically and comprehensively the defects in their service management and service quality [13], so as to formulate and implement more targeted improvement measures, effectively improve service quality and enhance consumer satisfaction.

On the one hand, IPA can be used to analyze the competitiveness of the club, on the other hand, it can also self-evaluate the service delivery system and customer satisfaction of the club itself, and help the club managers redistribute resources [14].

3. Research Contents

3.1 Research Subjects

Zhuhai City is located in north latitude $21^{\circ}48'-22^{\circ}27'$, longitude $113^{\circ}03'-114^{\circ}19'$, and has a typical subtropical monsoon maritime climate, which annual average temperature is 22.5°C , annual average relative humidity is 80%, and the average annual rainfall of 206.9 mm. Golden Gulf golf club is located in Zhuhai City, Guangdong Province. It is the first high standard 27-hole championship course designed by Colin·Montgomerie in mainland China in 2003. The total area of the course is about 2.5km^2 . The total length of the fairway area is 6532m. The turf area is about 49000m^2 . The turfgrass planted in fairway area, rough area and driving range is Seashore Paspalum grass. The research object of this paper is Golden Gulf golf consumers and turf managers.

3.2 Questionnaire Design

Questionnaire survey was used to collect data in this study. There are two formal questionnaires, one for the satisfaction and importance of players to the various indexes of the club, the other for the turf manager about the turf management. Players' questionnaires mainly investigated the importance and satisfaction of 14 turf quality indexes, such as tee ground stability, coring, divot, green ball speed and so on. The questionnaires of turf managers consist of 8 indexes, such as turf uniformity, mowing height, dew treatment and so on. The questionnaire adopts the international general Likert five-level scoring method, and carries on the questionnaire survey from two angles of importance and satisfaction. Questionnaire will be very important / very satisfied, important / satisfied, general, unimportant / unsatisfactory, completely unimportant / very unsatisfactory divided into five levels, respectively, given the "5, 4, 3, 2, 1" score, the higher the score, the more important or satisfied [15].

3.3 Questionnaire Recycling

A total of 150 questionnaires were sent out in this survey, 133 of which were recovered, the rate of which was 88.67%; 107 of which were valid, and the rate of validity was 80.45%. Among the 107 questionnaires collected effectively, 67.3% were male and 32.7% were female; the age of players was mainly young and middle-aged (21-40 years old, 46.7%), 9.4% were adolescents (below 20 years old), and 43.9% were over 40 years old.

there are 40 turf managers in Golden Gulf golf club. They send out 40 questionnaires and 37 valid ones, with an effective rate of 92.5%.

This study are carried out in summer of 2017.

3.4 Reliability Analysis of Questionnaire

In order to ensure the reliability of the questionnaire, Cronbach Reliability Alpha test was carried out on the importance scale and satisfaction scale of the indexes of the two questionnaires. The Alpha of each index of importance and satisfaction of players questionnaire were 0.746 and 0.662, respectively, which are less than the turf managers' questionnaire that the Alpha of eight indexes of importance and satisfaction are 0.858 and 0.916, respectively. It shows that the internal reliability of two questionnaires is acceptable reluctantly.

This study uses SPSS17.0 for data statistics and draws an IPA model.

4. IPA of Turf Quality of Golden Gulf Golf Club

4.1 IPA Data of Players

This questionnaire selected 14 turf quality indexes to study the perception of golfers of Golden Gulf golf club in Zhuhai city. Analytical data show that the overall average of importance perception and performance perception of all indexes is 3.64 and 3.92. Therefore, the vertical intersection of importance and performance is located on (3.64, 3.92). Based on this vertical intersection, four quadrants of IPA are formed.

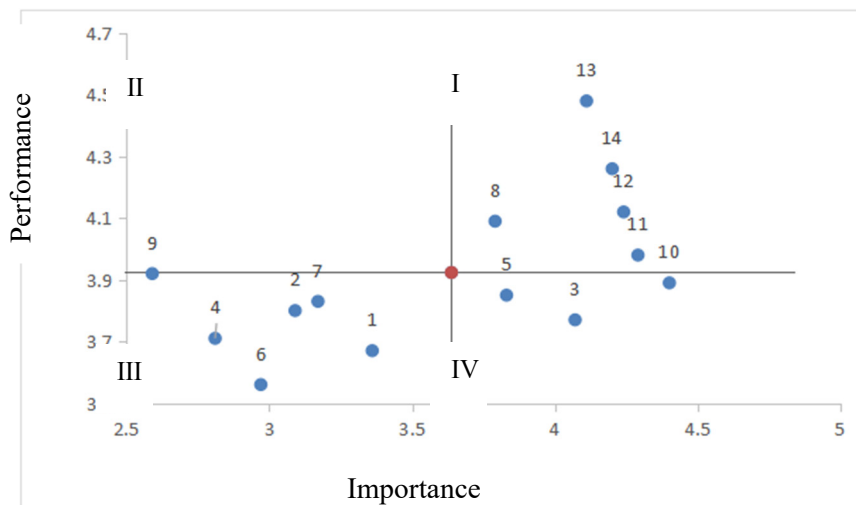


Figure 1. IPA Model of Turf Quality Indexes of Player

Fig. 1 shows that in the first quadrant, there are five indexes of divot treatment, turf elasticity, grass texture, turf recovery ability and density. That is to say, the players think this five indexes are not only very important, but also highly satisfied with them. Table 1 relevance test analysis shows that the P values of these five indexes are <0.05, indicating that there are significant differences in the perception of these five indexes. By comparing the mean differences of the five indexes, the players' satisfaction with the divot treatment and grass texture was significantly higher than their perception of importance, while their satisfaction with turf elasticity and turf recovery ability was lower than their perception of importance. By combining the mean difference with P value, the turf elasticity and turf recovery ability are far from the expectations of the players, and efforts need to be made to do better; divot treatment, grass texture and turf density management results exceed the expectations of the players. In this quadrant, grass texture (4.11, 4.48), turf density (4.2, 4.26) and turf elasticity (4.24, 4.12) are agreed by the players (the mean difference between importance and satisfaction is small).

Table 1. The Relevance between the Importance and Performance of Turf Quality Indexes in Player Questionnaire

Number	Index	Importance	Performance Degree	Difference Value	Pearson Correlation Coefficient
1	Weed Control	3.36	3.67	0.31	0.000
2	Tee Ground Stability	3.09	3.80	0.71	0.019
3	Coring	4.07	3.77	-0.3	0.047
4	Dew Treatment	2.81	3.71	0.90	0.009
5	Fertilizer Odor	3.83	3.85	0.02	0.009
6	Light Shadow	2.97	3.56	0.059	0.000
7	Grass Color	3.17	3.83	0.66	0.000
8	Divot Treatmen	3.79	4.09	0.30	0.000
9	Defoliation Cleaning	2.59	3.92	1.33	0.000
10	Green Ball Speed	4.40	3.89	-0.51	0.187
11	Turf Recovery Ability	4.29	3.98	-0.31	0.009
12	Turf Elasticity	4.24	4.12	-0.12	0.009
13	Grass Texture	4.11	4.48	0.37	0.000
14	Turf Density	4.20	4.26	0.06	0.000

In the third quadrant, there are weed control, tee ground stability, light shadow, grass color, dew treatment and defoliation cleaning six indexes. For players, the importance and performance are not high. Table 1 relevance test analysis showed that the P values of the six indexes were <0.05 , indicating that there were significant differences in the perception of the six indexes among golfers in Golden Gulf golf club. From the mean difference, the performance perception of the six indexes is higher than the importance. By combining mean difference with P value, the six indexes are neither important nor relatively high in performance perception level.

As can be seen from Fig.1, in the fourth quadrant are indexes of coring, fertilizer odor and green ball speed. That is to say, the players think these three indexes are very important, but their satisfaction is low. Table 1 relevance test analysis showed that the P values of coring and fertilizer odor were <0.05 , but the P values of green ball speed were $0.187 > 0.05$, indicating that there were significant differences in the performance perception of coring and fertilizer odor, but there was no significant difference in the perception of green ball speed. From the point of view of mean difference, the performance perception of coring and green ball speed is lower than the importance, so it should be an urgent aspect to improve for Golden Gulf golf club.

4.2 IPA Data of Turf Manager

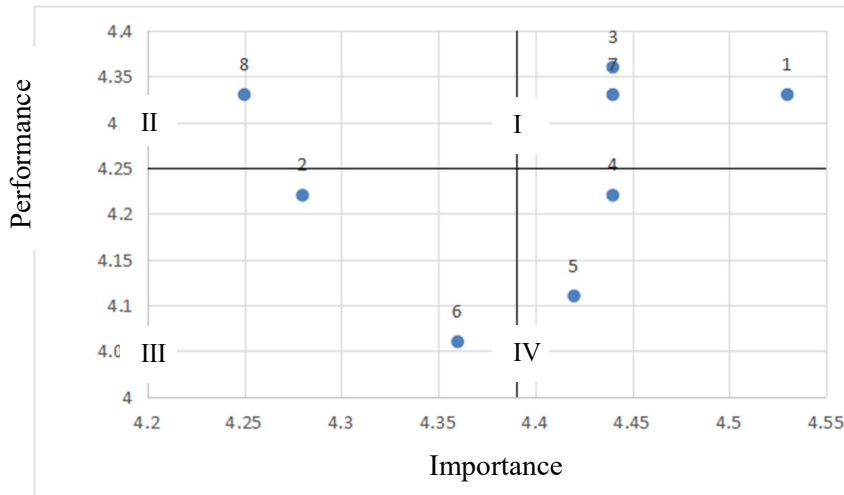


Figure 2. IPA Model of Turf Quality Indexes of Turf Managers

This questionnaire selected eight turf quality indexes to study the perception of turf managers of Golden Gulf golf club. Analytical data show that the overall mean of importance and performance are 4.39 and 4.25 respectively. The vertical intersection point are located at (4.39, 4.25), and four quadrants of IPA model are formed based on the vertical intersection point. Figure 2 shows that the indexes of quadrant I are turf uniformity, mowing height and grass texture, which indicates that turf managers think that these three indexes have high contribution value to turf quality, and the three indexes are equally important in the eyes of players, and their satisfaction is relatively high. Table 2 relevance test analysis showed that both turf uniformity and grass texture P values were <0.05 , indicating that there were significant differences in turf managers' perception of turf uniformity and grass texture performance. However, the p value of mowing height was $0.081 > 0.05$, which indicated that there was no significant difference in the perception of turf mowing height among turf managers. It proves that the turf managers have done well in these three indexes, which meets the requirements of the players for the quality of the course turf. Follow-up should be maintained or innovated in the current level of maintenance management.

Table 2. The Relevance between the Importance and Performance of Turf Quality Indexes in Turf Manager Questionnaire

Index	Importance	Performance	Degree Difference Value	Pearson Correlation Coefficient
Turf Uniformity	4.53	4.33	-0.2	0.027
Tee Ground Stability	4.28	4.22	-0.06	0.000
Mowing Height	4.44	4.36	-0.08	0.081
Green Ball Speed	4.44	4.22	-0.22	0.000
Turf Recovery Ability	4.42	4.11	-0.31	0.000
Turf Elasticity	4.36	4.06	-0.3	0.108
Grass Texture	4.44	4.33	-0.11	0.000
Turf Density	4.25	4.33	0.08	0.649

The index of the second quadrant is turf density. This index has high performance but low importance. The P value of turf density in Table 2 is $0.649 > 0.05$, which indicates that there is no obvious difference in the perception of turf density among turf managers. They think that turf density is of little importance and low contribution value to turf quality, but their evaluation is better, suggesting that the allocation of human and material resources is unreasonable or that the resources invested in keeping turf density may cause waste.

The indexes of the third quadrant are: tee ground stability and turf elasticity. The performance and importance of this quadrant are low. The P values of the two indexes were both $0.000 < 0.05$, which indicated that there were significant differences in turf managers' perception of the stability of tee ground and the turf elasticity performance. The data show that the tee ground stability and the turf elasticity are not very important for turf managers, and their contribution value to turf quality is low, and their management level is not very good at present.

The fourth quadrant indexes are green ball speed and turf recovery ability. The performance of these two indexes is low, but their importance is high. The P values of both indexes were $0.000 < 0.05$, which indicated that there were significant differences in the perception of green ball speed and turf recovery ability between turf managers. It meant that turf managers believed that the two indexes contributed a lot to turf quality, but did not meet their expectations, so they needed immediate attention [16].

Generally speaking, according to the turf quality evaluation data of Golden Gulf golf club, the evaluation result turf quality is Medium.

From Table 2, the performance evaluation of indexes of turf quality is generally lower than the importance to turf managers, which proves that turf managers are not very satisfied with the turf quality. Moreover, the evaluation effect of turf quality is medium, which shows that the measures of turf maintenance and management have not achieved the expected effect.

5. Conclusion

In the opinion of players, the important indexes are not necessarily important for turf managers. Except that the tee ground stability and grass texture in the same quadrant in the IPA model of the two questionnaires, the other indexes in the different quadrants of the two IPA model, consumers and turf managers have biases in their perceptions of these indexes.

For players, the indexes of high importance and performance are: divot treatment, turf elasticity, grass texture, turf density and turf recovery ability. For turf managers, the indexes of high importance and performance are: turf uniformity, mowing height and grass texture. The index of turf density belongs to keep up the good work in the eyes of the players, which proves that the players thought high importance and satisfaction with the density of the turf, but in the mind of the turf managers, it belongs to the possible overkill, which is not very important but highly satisfied with it.

However, for players, the indexes of high importance but low performance are: coring treatment, fertilizer odor, green ball speed. Turf recovery ability, in the eyes of players, its performance and importance are high, however, in the eyes of managers, its importance is high, but performance is low. Therefore, turf managers can take effective measures to improve turf recovery ability. For example, coring can make water, fertilizer, gas, pesticides more easily enter the root layer [17], thus improving the physical properties of the soil. At the same time, coring can cut off the old roots, promote the growth of new roots, and prevent turf deteriorating [18]. Therefore, coring can also help to improve the recovery ability of turf.

For players, the indexes of low importance and performance are weed control, dew treatment, Defoliation cleaning, tee ground stability, light shadow and grass color. In the eyes of turf managers, tee ground stability and turf elasticity should belong to the range of low importance and performance.

According to the questionnaire, turf managers are timely in weed control and dew treatment in most cases, which also reflects their attention to these two aspects of treatment. To sum up, the human and material resources investment in aspects with low importance and satisfaction in the eyes of players should be reduced appropriately, such as weed control, dew treatment, defoliation cleaning, tee ground stability, light shadow and grass color.

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