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CHOOSING THE BEST PORT ALTERNATIVE FOR CRUISE SHIPS

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ABSTRACT

Recently, the number of people who want to prefer cruise rather than holiday camp or holiday village have been increasing. There are some reasons why many people think about like this such as discovering different places in limited time and having much more options. In addition to this, thanks to increasing the usage of internet and many advertisement, many people want to visit different places. That is why, tour companies provide their customers with many options like cruise in summer time. Between these options, one of the most important decisive point is port of call. Port options are Antalya, Istanbul and Bodrum. In this paper, it will be analyzed that which port will be more preferable than others. Analytical hierarchy process (AHP) which is multi-criteria decision making methods are employed in the study. Weights of criteria are calculated with AHP method is used in the ordering of alternatives. According to the obtained results, social and touristic opportunity is determined to be the most significant criterion in port selection. Bodrum is the most preferred cruise by the people participated in the study.

1. Introduction

In the end of 1960s, The modern cruise industry came to exist. Although it can be said that the cruise industry is still new options for customers' summer vocation (Hur & Adler, 2013). Their role of tourism industry has been increasing day by day. Between 1980 to 2011, annual growth rate are around 7.6%. It also showed the income for each destination. In addition to this, cruise market has great potential for the future, when financial crisis occurs in 2008 and 2009, market doesnt affect demand for cruises and also reached 13% annual growth rate.

Cruise liners have increased services to passengers, giving them not only the opportunity to relax onboard but also to participate in onshore activities and services available at their destinations.

With the growth in the Turkey market, the ports in this region are under pressure to improve the quality of their services and maintain competitiveness in terms of passenger terminal developments and associated tourism infrastructure.

There are some various factors that the paper will focus on determining the best port destination in Turkey. Some of them are, recognition level, port opportunities, touristic and historical places, social life in the city, coast situations, shopping situations, variety of food options, daily fee for accommodation and costliness of city etc. However, it is impossible to take all aboved factors into considerations, so there are 3 there top significant factors will be analyzed. These are recognition level, social opportunities and coast situation and they shows that Figure 1.

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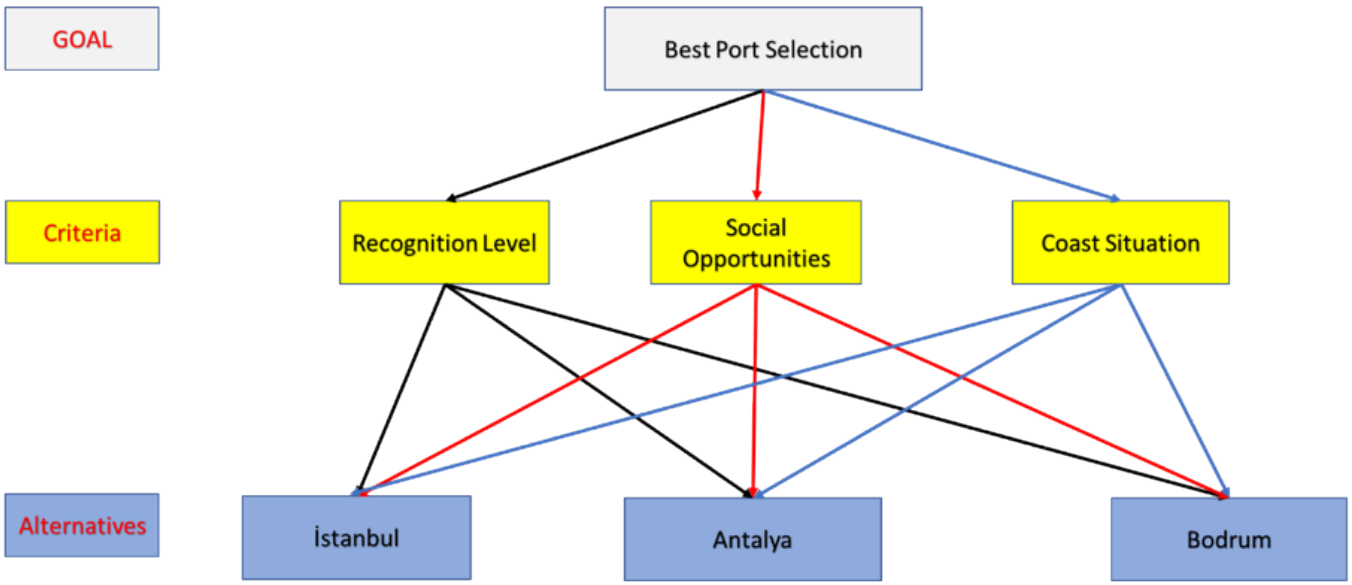

Figure 1.Criteria and Alternatives.

2. Methodology

The Analytic Hierarchy Process (AHP) is a configure technique for regulation and examination complicated decisions, depending mathematics and psychology. It was improved by Thomas L. Saaty in the 1970s and has been comprehensively studied and refined since then.

It has specific application in group decision making, and is used across the globe in a extensive variety of decision condition, in fields such as government, business, industry, healthcare, shipbuilding and education.

In this study, alternatives are weighted on the on the basis of each criterion determined by the experts. And then, the criteria were weighted by the experts. Finally, these ratings were normalized and then matrix multiplication was performed to find the best port alternatives for cruise ships.

3. Literature Review

In the literature there are many studies about location / place selection with AHP. For instance; in [1] made optimal establishment place selection for furniture industry with AHP.

In [2], the AHP model ensure a structure to aid managers in analysing manifold location factors, assessment location alternatives and finding optimal location selections.

In [3], suggest a AHP/ANP based measurement model for assessment location characteristics in order to assist executive to notice the advantages of latent facility.

In [4] utilize the AHP to analyze progress of logistic headquarters in Laos which purpose turn into a “land-linked” country from land-locked city.

In [5], presents a place choice problem for military airport make use of multiple criteria decision making methods. The criteria weights are decision making AHP, sorting and choice transactions of alternatives are carried out exploiting PROMETHEE and VIKOR method.

In [6], set sight on the multi effect evaluation of hospital places using AHP and consideration three possible rural hospital location in India.

In [7], applies AHP to find out and analyse transhipment port selection by global carriers. They determine four main service criteria/attributes comprising 12 sub-criteria. The results of the AHP analysis revealed that both global container carriers and port service providers had a similar perception of the most important service attributes for transhipment port selection.

In [8], the findings of a survey to determine the service characteristics that shippers consider important when selecting a port and the way these characteristics are prioritised according to their importance. They determine seven criteria for the port selection decision and four ports. They use the findings of the study to develop port services.

In [9], proposes a decision support system (DSS) for port selection using AHP methodology. The proposed DSS is web-based.

In [10], is to construct an AHP model for simulating the behaviors of carriers port choice and identifying the importance weight of every influential factor influencing carriers port choices in the multiple-ports region.

In [11], a new TOPSIS approach for selecting plant location under linguistic environments is presented, where the ratings of various alternative locations under various criteria, and the weights of various criteria are assessed in linguistic terms represented by fuzzy numbers.
Compared with existing fuzzy TOPSIS methods, the proposed method can deal with group decision-making problems in a more efficient manner.

In [12], an integrated decision-making methodology is designed that employs the three well-known decision-making techniques, namely Delphi, analytic hierarchical process (AHP), and preference ranking organization method for enrichment evaluations (PROMETHEE) in order to make the best use of information available, either implicitly or explicitly.

In [13], the three decision making methods, namely Delphi, AHP and improved VIKOR, are hybridized in order to make theabest use of information available based on the decision makers or experts. In this respect, the aim of using Delphi is to select the most influential criteria by a few decision makers.
The AHP is utilized to give weights of the selected criteria. Finally, the improved VIKOR method is applied to rank alternatives.

In [14] analytic hierarchy process (AHP) approach is used to arrive at consensus decision. The AHP model is formulated and applied to a real case study to examine its feasibility in selecting the plant location for a manufacturing industry.

In [15], an integrated decision-making methodology is designed which employs the two well-known decision making techniques, namely Analytical hierarchy process (AHP), and Preference ranking organization method for enrichment evaluations (PROMETHEE-II) in order to make the best use of information available, either implicitly or explicitly.

In [16], presents a multi-criteria decision making (MCDM) methodology for the location problem. A new mathematical model is proposed with the aid of the fuzzy analytic hierarchy process (FAHP) to make the plant location decision.

4. Case Study

In the aboved mentioned that, there are 3 criteria which are recognation level, social opportunity and Coast Situation also there are three destination options which are Bodrum, Antalya and İstanbul.
From this point a numerical example will be shown using the alternatives and criteria and then finally determining the best port alternative.

Alternatives are weighted on the on the basis of each criterion determined by the experts. And then, the criteria were weighted by the experts. Finally, these ratings were normalized and then matrix multiplication was performed to find the best port alternatives for cruise ships.

a. Scores of Alternatives Acording to Criteria

In this section alternatives are weighted on the basis of each criterion determined by the experts and then the scores normalized.

(1) Recognation Level Score

The average of the scores given by the experts fort he recognation level criterion is presented in Table 1.

City	İstanbul	Bodrum	Antalya
İstanbul	1,00	2,00	3,00
Bodrum	0,50	1,00	7,00
Antalya	0,33	0,14	1,00
	1,83	3,14	11,00

Table 1. Recognation Level Score.

The normalized versions of the scores given for the recognation level are shown on the Table 2.

Recognition Level			
City	İstanbul	Bodrum	Antalya
İstanbul	0,55	0,64	0,27
Bodrum	0,27	0,32	0,64
Antalya	0,18	0,05	0,09

Table 2. Recognation Level Normalization Score.

(2) Social Opportunies Score

The average of the scores given by the experts fort the social opportunies criterion is presented in Table 3.

Social Opportunies			
City	İstanbul	Bodrum	Antalya
İstanbul	1,00	0,20	0,33
Bodrum	5,00	1,00	5,00
Antalya	3,00	0,20	1,00
	9,00	1,40	6,33

Table 3. Social Opportunies Score.

The normalized versions of the scores given for the social opportunies are shown on the Table 4.

Social Opportunies			
City	İstanbul	Bodrum	Antalya
İstanbul	0,11	0,14	0,05
Bodrum	0,56	0,71	0,79
Antalya	0,33	0,14	0,16

Table 4. Social Opportunies Normalization Score.

(3) Coast Situation Score

The average of the scores given by the experts fort the coast situation criterion is presented in Table 5.

Coast Situation			
City	İstanbul	Bodrum	Antalya
İstanbul	1,00	0,11	0,14
Bodrum	9,00	1,00	5,00
Antalya	7,00	0,20	1,00
	17,00	1,31	6,14

Table 5. Coast Situation Score.

The normalized versions of the scores given for the recognation level are shown on the Table 6.

Coast Situation			
City	İstanbul	Bodrum	Antalya
İstanbul	0,06	0,08	0,02
Bodrum	0,53	0,76	0,81
Antalya	0,41	0,15	0,16

Table 6. Coast Situation Normalization Score.

(4) Weights of Alternatives

After the scores of the alternatives are normalized, they are shown in matrix form on the Table 7.

City	Recognition Level	Social Opportunies	Coast Situation
İstanbul	0,48	0,10	0,06
Bodrum	0,41	0,69	0,70
Antalya	0,11	0,21	0,24

Table 7. Weights of Alternatives.

b. Scores of Criteria

In this section criterias are weighted by the experts and then the scores normalized.

(1) Criteria Score and Normalization

The average of the scores given by the experts fort the each of criterion is presented in Table 8.

City	Recognition Level	Social Opportunies	Coast Situation
Recognition Level	1,00	0,11	0,11
Social Opportunies	9,00	1,00	2,00
Coast Situation	9,00	0,50	1,00

Table 8. Criteria Score.

The normalized versions of the scores given for the each of criterion are shown on the Table 9.

City	Recognition Level	Social Opportunies	Coast Situation
Recognition Level	0,05	0,07	0,04
Social Opportunies	0,47	0,62	0,64
Coast Situation	0,47	0,31	0,32

Table 9. Criteria Normalization Score.

(2) Weight of Criteria

After the scores of the alternatives are normalized, they are shown in matrix form on the Table 10.

Criteria	Weight
Recognition Level	0,05
Social Opportunies	0,58
Coast Situation	0,37

Table 10. Weights of Criteria.

c. Prioritization of Alternatives

Matrix multiplication was performed using the matrices normalized to the alternatives and criteria in this section. The results show the prioritization of the best port alternative. The results are shown on the Table 11.

City	Score
İstanbul	0,11
Bodrum	0,68
Antalya	0,22

Table 11. Prioritization of Alternatives.

ç. Consistency Ratio

The consistency of the scores given by the experts in this study was measured by the Consistency Ratio (CR). The consistency of the scores given (CR) is 0,047.

5. Conclusion

Recently, the number of people who want to prefer cruise rather than holiday camp or holiday village have been increasing. So there are 3 top significant factors will be analyzed.

These are recognition level, social opportunities and coast situation. Role of a tourism industry has been increasing day by day. Between 1980 to 2011, annual growth rate are around 7.6%. It also showed the income for each destination.

In addition to this, cruise market has great potential for the future, when financial crisis occurs in 2008 and 2009, market doesn't affect demand for cruises and also reached 13% annual growth rate.

It was analyzed that which port will be more preferable than others. AHP which is multi-criteria decision making methods were employed in the study.

Weights of criteria are calculated with AHP method is used in the ordering of alternatives. According to the obtained results, social and touristic opportunity was determined to be the most significant criterion in port selection by survey. Bodrum is the most preferred cruise by the people participated in the study.

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