

ECE-411 - Homework 5: Make A Decision Team 4

Decision to Make

Which hotel to stay at during upcoming family trip to Disney World

Decision Matrix

FAMILY VACATION HOTEL DECISION MATRIX				
		HILTON	HOLIDAY INN	FOUR SEASONS
COST	3	3	5	1
AMENITIES	4	3	2	5
FAMILY FRIENDLY	5	3	4	3
WALKABILITY	2	5	2	3
POSITIVE REVIEWS	5	4	1	5
SCORE		66	52	69

For the Decision Matrix a weight is assigned to each criteria based on its importance to the decision maker. The criteria for each option are then scored on a numerical scale. For this matrix the scale was 1 to 5. The final score for each option is then determined by summing the products of each criteria and its weight. As for which hotel to choose the result is Four Seasons.

AHP Matrix

FAMILY VACATION HOTEL AHP MATRIX				
		HILTON	HOLIDAY INN	FOUR SEASONS
COST	0.16	0.37	0.58	0.06
AMENITIES	0.31	0.11	0.07	0.81
FAMILY FRIENDLY	0.14	0.40	0.40	0.20
WALKABILITY	0.04	0.45	0.45	0.09
POSITIVE REVIEWS	0.35	0.27	0.35	0.38
SCORE		0.26	0.31	0.42

The AHP Matrix is very similar to the Decision matrix and produced the same decision result as the Decision Matrix. The criteria are weighted, and then final scores are calculated in the same way by summing the products of each criterion and its weight. What makes the AHP different is how the weights are determined and how the option scores for each criterion are determined. To determine the weights the decision maker determines the importance of each criterion compared to all the others. Giving a score greater than or equal to one in the given criteria is more important than another or scores of less than one if the given criteria is less important than another. The weight is then determined by dividing the geometric mean of the given criteria by the sum of the geometric means of all the criteria. The table below shows what this looks like.

CRITERIA WEIGHTING DETERMINATION							
	COST	AMENITIES	FAMILY FRIENDLY	WALKABILITY	POSITIVE REVIEWS	MEAN	WIEGHT
COST	1	1/3	1/2	7	1	1.0	0.16
AMENITIES	3	1	3	6	1/2	1.9	0.31
FAMILY FRIENDLY	2	1/3	1	3	1/4	0.9	0.14
WALKABILITY	1/7	1/6	1/3	1	1/7	0.3	0.04
POSITIVE REVIEWS	1	2	4	7	1	2.2	0.35

The option scores for each criterion are determined by rating the option against each other. The method for rating one option against the other will vary depending on what is being compared. In the case of cost one can simply divide the minimum cost by the given cost for each option and then normalize the results. The same thing can be done for number a star rating a hotel receives. For more subjective criteria a relative rating can be determined in the same fashion that the criteria weights were determined. The tables below show how the hotel option scores were determined for each criterion.

RATE COST RELATIVE TO CRITERIA			
	COST PER NIGHT	RELATIVE COST	NORMALIZED
HILTON	\$230.00	0.63	0.37
HOLIDAY IN	\$146.00	1.00	0.58
FOUR SEASONS	\$1,485.00	0.10	0.06

RATE AMENITIES RELATIVE TO CRITERIA					
	HILTON	HOLIDAY IN	FOUR SEASONS	MEAN	RATING
HILTON	1	2	1/9	0.61	0.11
HOLIDAY IN	1/2	1	1/9	0.38	0.07
FOUR SEASONS	9	9	1	4.33	0.81

RATE FAMILY FRIENDLY RELATIVE TO CRITERIA					
	HILTON	HOLIDAY IN	FOUR SEASONS	MEAN	RATING
HILTON	1	1	2	1.26	0.40
HOLIDAY IN	1	1	2	1.26	0.40
FOUR SEASONS	1/2	1/2	1	0.63	0.20

RATE FRIENDLY RELATIVE TO CRITERIA					
	HILTON	HOLIDAY IN	FOUR SEASONS	MEAN	RATING
HILTON	1	1	5	1.71	0.45
HOLIDAY IN	1	1	5	1.71	0.45
FOUR SEASONS	1/5	1/5	1	0.34	0.09

RATE REVIEW SCORES RELATIVE TO CRITERIA		
	STARS	RELATIVE STARS
HILTON	3.5	0.27
HOLIDAY IN	4.5	0.35
FOUR SEASONS	5.0	0.38