Tourist Satisfaction Factors via Analytic Hierarchy Process Decision Model on Cultural-Tourism in Kota Kinabalu, Sabah

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In recent years, the tourism and hospitality industry has shown a deepening diversified growth and has become internationally a quick and growing industry that contributes the most in the economic development. Tourism plays a vital role in promoting a country's cultural and heritage, while cultural tourism covers all the travelling aspects, whereby the local people educate tourists with their own living ways, beliefs and thoughts. Other resources have stated that cultural tourism involves high values of places related to tourism, history and heritage. As there are several places in Sabah that exhibit great values in history and heritage of the local people, there is a need to evaluate the best decision-making of multiple criteria in the field of cultural tourism. Factors are identified using the Analytic Hierarchy Process (AHP) in terms of tourists' preferability, especially in the selection of cultural tourism spots in Sabah as their place of visitation. The objectives of this study are to evaluate and compare the preferability of tourists visiting the cultural-tourism locations, and to identify the significant factors that attract the tourists to visit these cultural-tourism spots. Prior to the data analysis, 150 respondents through questionnaires will be randomly selected at different cultural-tourism spots in Kota Kinabalu, Sabah. The data will be analysed using the AHP method, with the aid of Saaty 1-9 scale. The AHP decision model in this study was developed with the aid of model-building procedures like the normal matrix of z-scores and mean scores, and the pairwise comparison matrix of weights of criteria and sub-criteria. Based on the overall AHP analysis, it was found that the Destination criterion was ranked the highest at 52.51%, followed by criterion of Benefits with weight of 22.36%, partially ranked at 14.29% was Activities criterion, the criterion of Safety earned the weight 6.94%, and lastly the lowest ranking for Services criterion at 3.90%. From the analysis, it can be concluded that the most important factor in Cultural tourism was the Destination of the cultural spots.

Keywords: Cultural tourism, Analytic Hierarchy Process (AHP), tourists' preferability, significant factors, AHP decision model.

I. INTRODUCTION

In Malaysia, the arrival of tourists has been rapidly growing where in 2016 alone, tourist arrivals in the country had recorded 26.8 million arrivals, registering a total expenditure of MYR82.1 billion compared to the year 2015 where a turnover of 25.72 million tourist arrivals and MYR69.1 billion of expenditure only (WTTC, 2016). In addition, Tourism Malaysia has targeted an overall of 31.8 million arrivals and a total expenditure of MYR118 billion for 2017.

Cultural tourism covers all the travelling aspects whereby people travel to educate tourists with each other's living ways, their beliefs and thoughts (Roday *et. al.,* 2009). Furthermore, tourism theoreticians agree to the oldest "birth certificates" of tours of cultural which include the explorations by ancient Greeks and Romans as well as the academic aspect (Mikos von Rohrscheidt, 2008). Hence, cultural tourism is namely the earliest type of tourism because of the rising growth of interest in culture in recent decades, whereby, there are numerous definitions addressing cultural tourism.

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In addition, such opinion as cultural tourism is travelling for vital cultural motivations and explorations was maintained longer and best illustrated by Medlik (1995) and Marczak (2000). Medlik (1995) stated that cultural tourism is motivated tours to places of artistic and historical value, visits to museums and galleries, journeys taken in order to participate in artistic performances and other cultural events where as Marczak (2000) argued that cultural tourism involves high value places related to tourism, history and heritage.

II. MATERIALS AND METHODS

The study was conducted at two main Cultural Tourism spots in Kota Kinabalu, Sabah. They were Sabah State Museum and Mari-Mari Cultural Village, because these tourists' spots mainly focus on diversity of Cultures in Sabah.

A. Research Instrument

This study required the help of computer software's to analyse the data. IBM software Statistical Package for Social Science (SPSS) version 24.0 and Microsoft Excel are the main software's used in this study. SPSS is a software used to analyse the research data that had been collected from 150 respondents. Among the functions of SPSS were entering and editing data, data cleaning, summarizing data on the frequency distribution table, descriptive statistics, graphical or Chart form, analysing the data through tests such as factor analysis and pairwise comparison.

Microsoft Excel was used to store all the data that have been analysed using SPSS by copying the results of SPSS and to calculate the synthetization, consistency and overall priority ranking for the Analytic Hierarchy Process (AHP). Microsoft Excel was used more in terms of data storage in a systematic way in order to process and understand the data analysis.

B. Original Data

The original data to be used in this study were the raw data obtained through the distribution of questionnaires to tourists at two selected cultural tourism spots. There were two sections in the questionnaire; Section A was mainly about the respondents' demographic profiles, and Section B was about the importance of criteria for the design of cultural tourism, according to the situation and requirement in Kota Kinabalu.

The tourists were asked to assess the importance of cultural tourism design criteria on a scale ranging from (9 to 1). Respondent validity showed to determine how valid was the values obtained through these studies (Wells & Wollack, 2003). The respondent validity can be determined through construct validity, where a similar concept questionnaire given to the same respondents and the results checked were related (Bolarinwa, 2015). About 30 tourists were randomly selected for initial distribution of the questionnaires as the pilot test. The alpha Cronbach value was determined by using the following formula (Wells & Wollack, 2003):

$$\hat{\alpha} = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} p_i (1-p_i)}{\hat{\alpha}_x^2}\right) \qquad (1)$$

where,

k = number of variables

p_i = proportions of the respondents who answered variable i correctly

$\hat{\alpha}_x^2$ = sample variance of total population

The closer the value of α to 1.00, the higher the consistency, and the more efficient the instrument used. Thus, we were using alpha value of 0.60 as the minimum acceptable reliability test (Nunnally & Bernstein, 1994).

1. Statistical analysis for the questionnaire from respondents

In year 2008, Hines came up with a few statistical formulations to calculate the Arithmetic mean, Standard Deviation and Z-calculated (Hines *et. al.,* 2008). The formulation to calculate the arithmetic mean and standard deviation for each criterion follows equations (2) and (3) respectively (Hines et al. 2008):

$$\bar{X} = \frac{\sum_{i=1}^{k} X_i \cdot f_i}{\sum_{i=1}^{k} f_i} \qquad (2)$$

$$s = \left[\frac{\sum_{i=1}^{k}(X_i - \bar{x})^2 * f_i}{(\sum_{i=1}^{k} f_i)}\right]^{1/2} \qquad (3)$$

where

$\bar{x}$: Arithmetic Mean

S: Standard Deviation

Xi: degree of importance for criterion

fi: Frequency of degrees

The purpose of Z-score in this study is to check the reliability of the questionnaire values (Hines et al. 2008). After finding the Arithmetic Mean and Standard Deviation,

the quality of the survey result was tested with the Z test at a confidence level of 95%. Using formula in (4), the (Z calculated) for the criteria can then be calculated. The (Z calculated) were compared with (Z Tabular) at a confidence level of 95% to check the quality of the questionnaires results. At the end, if the (Z calculate) is higher than the (Z Tabular), we will accept the values of the questionnaire, and so is vice versa (Hassan & Yahya, 2018).

$$Zcalculate = \frac{\overline{x}}{\frac{s}{\sqrt{n}}} \qquad (4)$$

where

$\overline{x}$: Arithmetic Mean

S: Standard Deviation

n: sample size

"If [Z calculate > Z tabular] then Accept the results of questionnaire" or wise versa.

2.   AHP decision model

AHP is one way of making decisions and identify the location of the various criteria with a weighting of comparison in pairs. AHP also uses a hierarchical structure, allowing decision-makers to draw up criteria, sub-criteria and alternatives involved and so use a special matrix for a better assessment (Saaty, 2001). The decision-making process involves setting a higher priority and AHP are techniques that apply these principles. Typically, the individual preferences give profound effect on the results obtained.

The Hierarchical structure is important to develop criteria and sub-criteria which are involved; the hierarchy usually involves four stages, which were the objectives, criteria, sub-criteria and alternatives using a scale of 1 to 9 as in Table 1 (Saaty, 2005). Wang *et. al.,* (2004) had defined AHP as a decision-making tool that analyzes or disassembles the complex problem into a multi-level hierarchical structures of goal, criteria, sub-criteria and alternatives. In general, AHP is to transform objective estimates of relative important into a set of degrees or total weights. With the aid of this method of fundamental property, which was based on the Pairwise Comparison, it complements the various quantitative and qualitative measures to combine them into one comprehensive degree that expresses the order of the alternative between a set of decision alternatives, as shown in Figure 1 below (Hines *et. al.,* 2008; Saaty, 2005).
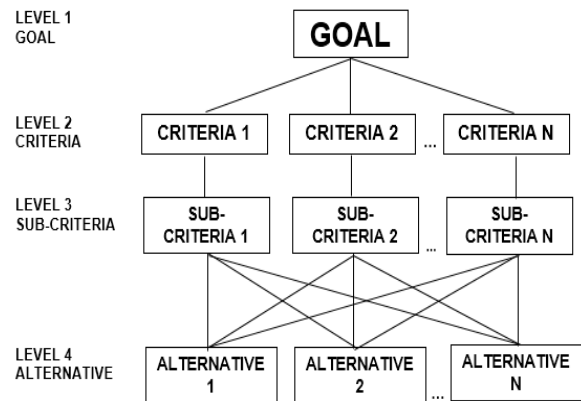

Figure 1. Analytic Hierarchy Process (AHP) model

Figure 2 depicts the hierarchical structure based on the multiple criteria and sub criteria used in this study for decision makers in the tourism industry.

Table 1. Fundamental scale of absolute numbers (Saaty, 2005)

| Intensity of Importance	Definition	Explanation
1	Equal Important	Two activities contribute equally to the objective
2	Weak or Slight	
3	Moderate Important	Experience and judgment slightly favour one activity over another
4	Moderate plus	
5	Strong Important	Experience and judgment strongly favour one activity over another
6	Strong plus	
7	Very strong or demonstrated important	An activity is favoured very strongly over another; its dominance demonstrated in practice
8	Very strong plus	
9	Extreme importance	The evidence favouring one activity over another is of the higher possible order of affirmation
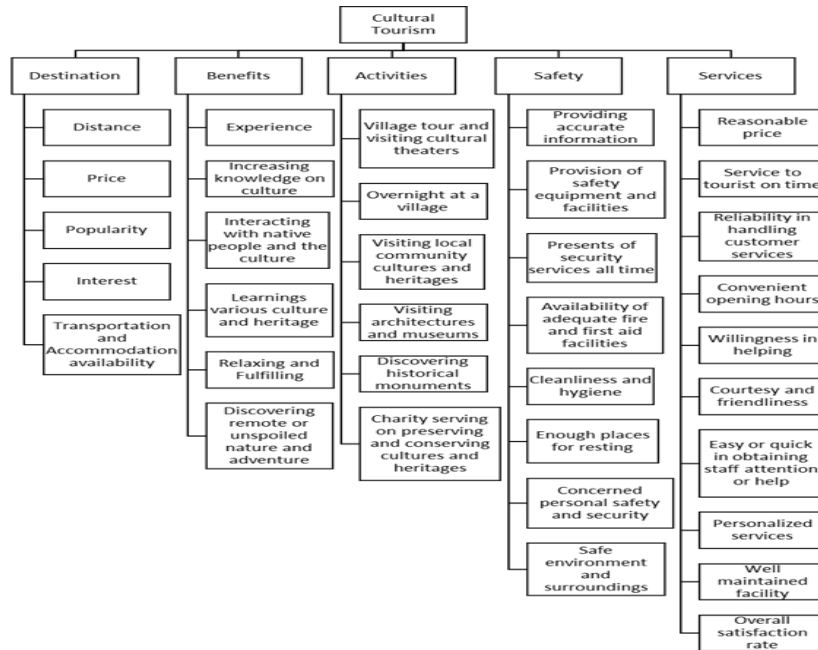
Figure 2. Building an AHP hierarchical decision model with multiple criteria.

III. RESULTS AND DISCUSSIONS

The results were obtained from analyses of data that had been gathered from the questionnaires from 150 respondents at the respective tourist hotspots in Kota Kinabalu, Sabah. The questionnaire undergoes statistical analysis before the AHP test. There were four main steps in the Analytic Hierarchy Process (AHP) as discussed in the methodology which were namely, constructed pairwise comparison matrix, building normal matrix, calculating the Weights, and consistency analysis will be shown clearly and explained. All these steps will identify the position of each criteria and sub-criteria according to the Weights respectively, and hence, the best criteria in contributing tourism industry can thus be determined.

A. Reliability Statistics Results

The questionnaire has been statistically analysed by firstly distributing the questionnaire as a pilot test to determine its reliability. Cronbach's Alpha is the most popular index which provides a measure of the extent to which the items on a test, each of which could be thought of as a mini-test providing consistent data regarding ones' mastery of the field (Bolarinwa, 2015).

Table 2. Cronbach alpha values

Reliability Statistics			
	Cronbach's Alpha	N of Items	N of respondents
Pilot study	0.966	74	30
Total survey	0.983	74	150

Cronbach alpha values were found to vary according to the number of respondents who participated in the pilot test, where the data from the questionnaires of 30 respondents had a Cronbach alpha of 0.966 which then had increased by 0.017 to 0.983 for the total 150 respondents of final data collected. Since both Cronbach values were more than 0.60, and were closer to 1.00, thus, both Cronbach Alpha values were said to be reliable, and the questionnaire could thus be trusted and used for distribution.

B. Statistical Analysis Results

The values of the (Z Calculate) for criteria are shown in Table 3. The value of (Z Tabular) was equal to 1.645 at 95% level of confidence and sample size of 150 respondents. From the comparison between the (Z Calculate) and (Z Tabular), it can be noted that the values of (Z Calculate) as shown in Table 3 for each criterion were all greater than the (Z Tabular). Since

the values of (Z Calculate) were all higher than (Z Tabular), thus these items in the questionnaire obtained at the 95% confidence level are acceptable and reliable.

Table 3. Statistical Results for Questionnaire Items

Descriptive Statistics			
	Mean	Std. Deviation	Z Calculated
Destination	6.61	2.049	39.5098
Distance	6.33	2.048	37.8547
Price	6.27	2.260	33.9785
Popularity	6.58	1.964	41.0327
Interest	7.09	2.000	43.4172
Transportation and Accommodation availability	6.74	1.971	41.8812
Benefits	6.67	1.946	41.9787
Experience	6.74	1.985	41.5858
Increasing knowledge on culture	6.44	1.826	43.1947
Interacting with native people and the culture	6.29	2.018	38.1747
Learnings various culture and heritage	6.19	2.160	35.0980
Relaxing and Fulfilling	7.45	1.595	57.2060
Discovering remote or unspoiled nature and adventure	6.65	2.063	39.4792
Activities	6.43	1.991	39.5535
Village tour and visiting cultural theaters	6.46	1.965	40.2015
Overnight at a village	5.93	2.244	32.3651
Visiting local community cultures and heritages	5.98	2.074	35.3133
Visiting architectures and museums	6.61	1.787	45.3025
Discovering historical monuments	6.91	1.783	47.4649
Charity serving on preserving and conserving cultures and heritages	6.09	2.130	35.0174
Safety	6.75	1.891	43.7178
Providing accurate information	6.39	1.903	41.1252
Provision of safety equipment and facilities	6.76	1.729	47.8848
Presents of security services all time	6.59	1.836	43.9601
Availability of adequate fire and first aid facilities	6.46	1.870	42.3094
Cleanliness and hygiene	6.99	1.770	48.3670
Enough places for resting	6.85	1.779	47.1585
Concerned personal safety and security	7.09	1.804	48.1344
Safe environment and surroundings	7.02	1.782	48.2475
Services	6.99	1.797	47.6403
Reasonable price	7.13	1.903	45.8877
Service to tourist on time	6.66	1.690	48.2651
Reliability in handling customer services	6.41	1.711	45.8832
Convenient opening hours	6.89	1.643	51.3603
Willingness in helping	7.01	1.770	48.5054
Courtesy and friendliness	7.08	1.645	52.7124
Easy or quick in obtaining staff attention or help	6.92	1.608	52.7067
Personalized services	6.89	1.673	50.4393

Well maintained facility	7.06	1.692	51.1034
Overall satisfaction rate	6.95	1.962	43.3842

C. Weights of Main Criteria Results

After the statistical results had been analysed, the weights of criteria are specified for cultural tourism. This will be found by using AHP, which will produce pairwise comparison between the criteria depending on the values of the arithmetic mean, as in Table 3.

Table 4 below shows the matrix of pairwise comparison for the criteria. The end result of the questionnaires used via AHP is shown in Table 5. This gave priorities (or weights) of criteria with respect to the goal, and the weights of sub-criteria with respect to the main criteria and sub-criteria respectively.

Table 4. Pairwise Comparison Matrix of Main Criteria

Pairwise comparison					
	Destination	Benefits	Activities	Safety	Services
Destination	1	3	5	9	9
Benefits	1/3	1	4	2	5
Activities	1/5	1/4	1	3	6
Safety	1/9	1/2	1/3	1	2
Services	1/9	1/5	1/6	1/2	1

Table 5. Weights of main criteria and sub-criteria for Cultural tourism spots

Criteria	Priorities (Weights)	
Inconsistency = 0.08607		
Main Criteria for Ecotourism	Weight	Ranking
Destination	0.52513	1
Benefits	0.22359	2
Activities	0.14289	3
Safety	0.06935	5
Service	0.03904	4
Sub Criteria for Destination		
Inconsistency= 0.09249		
Distance	0.07479	4
Price	0.03338	5
Popularity	0.11787	3
Interest	0.43503	1
Transportation and Accommodation availability	0.33894	2
Sub Criteria for Benefits		
Inconsistency= 0.04710		
Experience	0.20745	3
Increasing knowledge on culture	0.09235	4
Interacting with native people and the culture	0.03541	6
Learning various culture and heritage	0.03719	5
Relaxing and fulfilling	0.37366	1

Discovering remote or unspoiled nature and adventure	0.25393	2
Sub Criteria for Activities		
Inconsistency=0.08114		
Village tour and visiting cultural theatres	**0.47635**	**1**
Overnight at a village	0.04570	5
Visiting local community cultures and heritages	0.06579	4
Visiting architectures and museums	0.02710	6
Discovering historical monuments	0.13242	3
Charity service on preserving and conserving cultures and heritages	0.25265	2
Sub Criteria for Safety		
Inconsistency= 0.08586		
Providing accurate information	0.01968	8
Provision of safety equipment and facilities	0.06011	5
Presents of security services all time	0.03385	6
Availability of adequate fire and first aid facilities	0.03013	7
Cleanliness and hygiene	**0.33515**	**1**
Sufficient places for resting	0.18060	3
Concerned personal safety and security	0.11931	4
Safe environment and surroundings	0.22117	2
Sub Criteria for Service		
Inconsistency= 0.09657		
Reasonable price	**0.24776**	**1**
Service to tourist on time	0.21244	2
Reliability in handling customer services	0.11796	4
Convenient opening hours	0.12168	3
Willingness in helping	0.09419	5
Courtesy and friendliness	0.07172	6
Easy or quick in obtaining staff attention or help	0.04532	7
Personalized services	0.03525	8
Well maintained facility	0.02706	9
Overall satisfaction rate	0.02661	10

Based on Table 5, the highest weight is received by the Destination criterion which is of 52.51% (highlighted in yellow). This indicates that this criterion is of great importance from the point of view of the tourists who visited these selected Cultural Tourism spots.

In the second place is the criterion of Benefits, which obtained a weight of 22.36%. It deserves this rank of importance because of its significant impact on in Cultural Tourism spots. The criterion of Activities, which earnes the weight of 14.29% is in a moderate proportion. The criterion of Safety earns the weight 6.94%, which is a medium proportion, and lastly the criterion of Services which obtains a proportion of importance of almost 3.90%, which is of a lower proportion. This proportion give an indication of less importance of compared to the other criteria in the Cultural Tourism Sector.

When doing a pairwise comparison between criteria in AHP, the inconsistency index equals to 0.08607 (highlighted in blue), which is less than the highest value (0.1). Hence, it is satisfactory according to the AHP conditions and requirements. The same goes to the sub-criteria in identifying the priorities, the inconsistency index for all comparison is less than 0.1. This demonstrates the possibility of depending on the judgment that have been received in the pairwise comparison for the main and sub criteria.

So far there is no other research that had been done before on cultural tourism in Sabah by using the AHP model

for decision making. However, there is a similar research done by Hassan & Yahya (2018) where they used AHP to assess the importance of design criteria for school buildings project in Iraq. They distributed questionnaires to 49 respondents where the authors used Z test to find out the quality of the questionnaire results at the 95% confidence level. At the end of the Z test all their (Z Calculate) values were higher than the (Z Tabular) value of 1.684; thus, their questionnaire results were used for AHP. After the AHP analysis, they found out that the most important criteria in the School building design was the Performance criteria which had the highest weight as compared to the other criteria, and at the same time, the Inconsistencies index for the Main criteria was 0.03294 which was less than 0.1. Therefore, the results of this study can be said to be similar to Hassan & Yahya (2018).

The sub-criteria for each criterion had also been ranked according to their weightage. Sub-criteria for Destination were ranked as followings; interest (43.5%), transportation and accommodation (33.9%), popularity (11.8%), distance (7.5%), and price (3.3%). The sub-criteria for Benefits were ranked as followings; relaxing and fulfilling (37.4%), discovering remote or unspoiled nature and adventure (25.4%), experience (20.7%), increasing knowledge on culture (9.2%), learning various culture and heritage (3.7%), and interacting with native people and the culture (3.5%).

Sub-criteria for Activities were ranked as followings; village tour and visiting cultural theatres (47.6%), charity service on preserving and conserving cultures and heritage (25.3%), Discovering historical monuments (13.2%), Visiting local community cultures and heritages (6.6%), Overnight at a village (4.6%), and Visiting architectures and museums (2.7%). Sub-criteria's ranking for Safety were as followings; Cleanliness and hygiene (33.5%), Safe environment and surroundings (22.1%), Sufficient places for resting (18.1%), Concerned personal safety and security (11.9%), Provision of safety equipment and facilities (6.0%), Presence of security services all time (3.4%), Availability of adequate fire and first aid facilities (3.0%), and Providing accurate information (2.0%).

Lastly, ranking of sub-criteria's for services were as followings; Reasonable price (24.8%), Service to tourist on time (21.2%), Convenient opening hours (12.2%), Reliability in handling customer services (11.8%), Willingness in helping (9.4%), Courtesy and friendliness (7.2%), Personalized services (3.5%), Well maintained facility (2.7%), and Overall satisfaction rate (2.7%).

IV. CONCLUSION

As a conclusion, the criteria that had been ranked from the high to the lower weightage were: Destination => Benefits => Activities => Safety => Services respectively. From observations too, tourists visited these cultural spots because of the vicinity of the Destination of the spots to the Kota Kinabalu International Airport (KKIA), hence saves tourists' traveling time and costs to these cultural spots.

V. ACKNOWLEDGEMENT

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