Visitors Satisfaction on Service Quality Using Factor Analysis: A Case Study of Islamic Heritage Park

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Abstract— This research paper seeks to determine the factor of visitor satisfaction on the services quality offered in the Islamic Heritage Park. Satisfaction factors will be determined using factor analysis. The respondents in this study were the tourists who come to visit the Islamic Heritage Park. This study used a questionnaire survey which will be given to visitors at random to assess their factor of satisfaction. Data were analysed using factor analysis to determine the major domains of visitor satisfaction in the service of Islamic Heritage Park. The study reveals that eight factors extract from the analysis that together accounted 73.904% of the total variance. These factors have been categorized as facilities, monuments, service given by staff, restaurant, transportation, shop (souvenirs, handicrafts), safety and visitors-friendly and lastly tourist guide.

Index Terms— Service Quality, Visitor satisfaction factor, Factor Analysis.

1 INTRODUCTION

ISLAMIC Heritage Park is located at Pulau Wan Man, Kuala Terengganu where the distance from the city center of Kuala Terengganu is approximately 4 kilometers away. It functions as a tourist attraction and their focus is on the excellence of art and architecture of Islamic heritage from around the world. The Islamic Heritage Park is a place of World Islamic Monuments interactive errant. It gives knowledge and informative entertainment about World Islamic destination. This park that been built in March 2005 is not only surrounded by mosque replicas but also a mosque called Crystal Mosque that has become a landmark for Kuala Terengganu. This theme park is one of the economic development projects for East Coast Economic Region. After three years of construction, then the park is officially opened on 3 February 2008 by the fifth Prime Minister of the Honorable Tun Abdullah bin Ahmad Badawi. With an area of 22.3 hectares and a total cost of RM 249.3 million (approximately U.S. $ 77.2 million), the people of Terengganu can boast the existence of the Islamic Heritage Park.

Islamic Heritage Park is divided into two zones, namely public zones and zones of Islamic Heritage Park complex. There are six phases of construction of the Islamic Civilization Park, where the first phase involves the construction of the Crystal Mosque and Imam and Bilal Special Housing. The second phase involves the construction of mosque monuments and Islamic landmarks. After that, the construction of the convention center is done for phase three and phase four is to do the construction of lagoons, open garden gazebos, jogging track, pavilion and the area for those who love fishing. While the fifth phase is the construction of the complex in the Islamic Heritage Park, perani, Binoculars and commercial center. Lastly, the final phase is the construction of the pellet and the entrance to the Park of Islamic Heritage. Islamic Heritage Park is the first theme park that recognizes Islamic architecture. The complex accomodates 21 building replicas related to the history of the world of Islam. The main attraction here is a showcase of 21 mosque replicas including monuments and statues that were built in the ratio 1:8 scale compared to the actual size of the mosque. The replica is 99 percent similar to the actual mosque. Mosque replicas that attract visitors are the National Mosque of Malaysia, the Dome of the Rock from Palestine, the Grand Mosque of Saudi Arabia, Al-Hambra Citadel of Spain and the Taj Mahal from Indian Country. There are also Mimbar Kalyan from Uzbekistan, Mausoleum of Abu Nasr from Afghanistan, Samarra Rotating Mimbar from Iraq, Mohd Ali Mosque of Cairo, the Great Mosque of Qairawan Tunisia Great Mosque from Agadez Nigeria, Aleppo Citadel of Syria, Kul Sharif Mosque of Russia and the Xian Mimbar from China. Icon of Islamic Heritage Park is the Crystal Mosque. This unique mosque made from crystal glass and steel which was officially opened by Seri Paduka Baginda Yang di-Pertuan Agong Tuanku Mizan Zainal Abidin on 8 February 2008. (Department of Tourism, 2009)

Zakaria Abas (2004), says that in facing the globalization era, an organization's ability to compete depends on the quality of products offered. Changes taking place in this millennium has added the need for improving the quality in the face of intensifying competition. Hence, the quality agenda has become a major agenda in competition for an organization to achieve excellence and growth business in domestic and international markets. He also stated that the quality is also said to be among the factors that equal importance to price when a

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customer makes a selection and the satisfaction.

Therefore, this study emphasizes the satisfaction of the tourists who visit the Islamic Heritage Park in the quality offered at this park. In fact, the success of the tourism industry depends on the level of satisfaction given by the tourists. The tourists will be satisfied when they are quality products and services and the warm hospitality. This hospitality and good reception will definitely be an attraction to lure back the tourists, as well as their friends and relatives constantly. Satisfied travelers will be pleased to tell friends and relatives about the commendable attitudes and manners of the operators and the workforce at a tourist spot in dealing with them.

2 METHODOLOGY

According Richad A. Joshnson, (2002), factor analysis was introduced by Galton in 1888. But the real mathematical model was introduced by Charles Spearman in 1904 when he studied a set of test scores generated by a linear function of a single factor. This model has been extended by Thurston in 1945 when he was adding more factors into the Spearman model. He also introduced the centroid method to anticipate the load factor of the correlation matrix derived from the model. In 1940, Lawley also introduce the maximum likelihood method in anticipation of load factors. These factors continue expanded continued by mathematicians such as Armstrong in 1967, Anderson and Robin in 1956.

Factor analysis is one of the multivariate statistical methods that attempt to explain the relationship between a numbers of variables which are mutually dependent on one another so as to produce one or more groups of fewer variables than the original number of variables. Factor analysis was also used to determine the dominant factors in explaining the problem. Richad A. Joshnson, (2002) said basically the factor analysis aims to obtain a number of factors that have the properties: (1) Be able to explain as much as possible uniformity of the data and (2) the factors are independent. Factor analysis explaining the origin of the variation of a number of variables using fewer factors and assumptions that are not visible with all the original variables can be expressed as a linear combination of these factors added to the residual rate.
Factor analysis is variables that begin with $X_1, X_2, \ldots\ldots, X_p$.

These variables are constructed using the matrix below:

$$\begin{pmatrix} X_1 \\ X_2 \\ X_p \end{pmatrix} = \begin{pmatrix} \iota_{11} & \iota_{12} & \iota_{1m} \\ \iota_{21} & \iota_{22} & \iota_{2m} \\ \iota_{p1} & \iota_{p2} & \iota_{pm} \end{pmatrix} \begin{pmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_m \end{pmatrix} + \begin{pmatrix} \ell_1 \\ \ell_2 \\ \ell_p \end{pmatrix}$$

Where

$X_1, X_2, \ldots\ldots, X_p$ is known variable.

ι_{ij} is a constant factor of the i[th] variable and the j[th].

λ_j is a j[th] factor.

Correlation matrix is calculated for each variable in the study. For this study, the variables that will be analyzed are the factors that affect the level of tourist satisfaction on the service in the Islamic Heritage Park. The next step is to isolate the factors according to the highest variance value as 1, the second highest variance as 2 and so on. Factors that have the same variance will be consigned to the same group. After that, the selection and rotation factors steps. Dominant factor will be selected and some of the studied factors that will be selected. For purposes of analysis, data and scores for the negative items are encoded so all items will have positive measurement values. The last step is to make decisions based on the output.

3 RESULT

Before analysing the data using factor analysis, tourist satisfaction data collected will be tested using Bartlett's Test of Sphericity to determine whether the correlation between the items sufficient to do the factor analysis. The test results are significant, p <0.05 indicates that the correlation between the items enough to do factor analysis. KMO test exhibit multicollinearity. If the same correlation value exists between two or more items, each item is measuring the same aspects. KMO tests help researchers determine whether the items are suitable if the KMO value greater than 0.50. In this case, the value of KMO indicates that the data does not have a serious multicollinearity problem and then the items are suitable for factor analysis conducted.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.965
Bartlett's Test of Sphericity	Approx. Chi-Square	23049.399
	df	1485
	Sig.	.000

From Table 1, the value for Kaiser-Meyer-Olkin measure of sampling adequacy is 0.965, which is greater than 0.6. The Kaiser-Meyer-Olkin indicator of sampling adequacy should be larger than 0.6 for a factor analysis to be appropriate. The Bartlett's Test of sphericity shows the significant value with 0.00 < α=0.05. Thus, the test results show that these items can be used in the Factor Analysis.

3.1 The Main Factors (Available)

According to Kaiser's criterion, the only important components (variables) are those that have an eigenvalue of 1 or more. The following table explains this procedure. The eigen-

values for each component (variable) are listed. Only the first nine variables recorded eigenvalues above 1 (50.755, 9.079, 3.812, 3.244, 3.071, 2.727, 2.523, 2.342). These nine variables explain a total of 73.904% of the variance (Cumulative % column). This analysis summarizes the main factors that meet Kaiser's criterion and affect the tourist satisfaction of Islamic Heritage Park, Terengganu.

Table 2: Total Variance Explained

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	26.393	50.755	50.755
2	4.721	9.079	59.834
3	1.982	3.812	63.646
4	1.687	3.244	63.241
5	1.597	3.071	66.312
6	1.418	2.727	69.039
7	1.312	2.523	71.562
8	1.218	2.342	73.904
9	.954	1.835	75.739
10	.924	1.777	77.516
11	.824	1.585	79.101
12	.709	1.363	80.464
13	.635	1.221	81.685
14	.574	1.104	82.789

3.2 Loading for each factor

Another purpose of factor analysis is to measure each item which shows the same concept. After that the item will be reduced become a factor to form a specific degree of correlation in each factor. The relationship between each item and factors are determined by the correlation or load factors. To improve the relationship between factors, the rotation method will be used to maximize the load of some items. Two common methods of diagonal rotation which produces factors that are not related or not depends on the item and oblique rotation of the factors are inter-connected (Richad A. Joshnson, 2002). Data from this study using a diagonal rotation analysis by assuming all factors are not independent of each other.

Diagonal rotation process for two major components factor can also be known as varimax. In this study, 52 items were subject to factor analysis, which is a statistical technique used to identify the relationship between factors that can be used to examine the relationship of many relationship set of variables (Lazim, 2004). By rule of thumb, load ± 0.4 will be accepted as a valid contributor factor.

Table 3: Rotated Component Matrix

	Component							
	1	2	3	4	5	6	7	8
D6	0.724							
D14	0.707							
D11	0.669							
D12	0.662							
D13	0.659							
D8	0.656							
D10	0.638							
D5	0.626							
D15	0.610							
D9	0.594							
D2	0.565							
D4	0.521							
D17		0.461						
D29		0.843						
D30		0.786						
D26		0.742						
D27		0.736						
D31		0.722						
D25		0.714						
D28		0.704						
D24		0.631						
D1		0.435						
D3		0.411						
CATG6			0.789					
CATG8			0.788					
CATG4			0.773					
CATG7			0.773					
CATG5			0.759					
CAR5				0.766				
CAR2				0.743				
CAR1				0.736				
CAR3				0.720				
CAR4				0.632				
CATr4					0.765			
CATr6					0.751			
CATr3					0.727			
CATr5					0.713			
CATr2					0.589			
CASh2						0.736		
CASh1						0.710		
CASh5						0.707		
CASh4						0.682		
CASa2							0.681	
CASa1							0.674	
CASu1							0.617	
CAM1							0.535	
CATo1							0.534	
D18								0.613
D20								0.587

D19								0.576
D22								0.541
D21								0.539

The factor loadings of all 52 items are shown above and reduced into 8 dimensions. These dimensions then been renamed suitably according to items that loaded into themselves. The example of new factor dimension is:

Dimension 1: Facilities

Item	Statement	Factor loading
1	Availability of the rest area	0.724
2	Facilities for elder	0.707
3	Transport condition	0.669
4	Availability of garbage can	0.662
5	Availability of information counter	0.659
6	Availability of signboard (road, building)	0.656
7	Availability of transport Activities	0.638
8	Availability of the public phone	0.626
9	Facilities for children	0.610
10	Availability of parking area	0.594
11	Cleanliness of the toilet/restroom	0.565
12	Cleanliness of restaurant/cafeteria	0.521

Dimension 2: Monuments

Item	Statement	Factor loading
1	Cleanliness of facilities	0.461
2	All monuments prefigure the true beauty of Islamic arts	0.843
3	Many Islamic value that we can have from each monument	0.786
4	Monuments increase knowledge about history of Islamic development	0.742
5	Monuments develop interest to involve in architecture	0.736
6	Gallery increase knowledge about history of that country	0.722
7	Information given about each monuments	0.714
8	Explanation by staff helps to understand about each monument	0.704
9	Monuments condition	0.631
10	Environment cleanliness	0.435
11	Prayer room cleanliness	0.411

Dimension 3: Service given by staff

Item	Statement	Factor loading
1	Politeness of staff	0.789
2	Appearance of staff	0.788
3	Assistances of staff	0.773
4	The staff is trained properly	0.773
5	Competence of staff	0.759

Dimension 4: Restaurant

Item	Statement	Factor loading
1	Quality of food at the restaurant	0.766
2	Variety of menus at the restaurant	0.743
3	Service quality at the restaurant	0.736
4	Cleanliness of the restaurant	0.720
5	Price of food at the restaurant	0.632

Dimension 5: Transportation

Item	Statement	Factor loading
1	Frequency of transport service	0.765
2	Easy to get the transport service	0.751
3	The transport service is comfortable	0.727
4	Attitude of the driver	0.713
5	Prices for transport service	0.589

Dimension 6: Shop (souvenirs, handicrafts)

Item	Statement	Factor loading
1	Availability of the shop	0.736
2	Service quality at the shop	0.710
3	Product quality at the shop	0.707
4	Easy to find the shop	0.682

Dimension 7: Safety and visitors-friendly

Item	Statement	Factor loading
1	Availability of CCTV	0.681
2	Safety at the park	0.674
3	Availability of the prayer room	0.617
4	Number of monument	0.535
5	Availability of toilet/restroom	0.534

Dimension 8: Tourist guide

Item	Statement	Factor loading
1	Friendliness of tourist guide	0.613
2	Treatment from the tourist guide	0.587
3	The tourist guide is knowledgeable	0.576
4	Service given at each monument	0.541
5	Service given at the entrance	0.539

Table 4: Cronbach's alpha value for every dimension produced.

No.	Dimensions	Cronbach's Alpha Value
1	Facilities	0.947
2	Monuments	0.944
3	Service given by staff	0.966
4	Restaurant	0.901
5	Transportation	0.932
6	Shop (souvenirs, handicrafts)	0.928
7	Safety and visitors-friendly	0.847
8	Tourist guide	0.944

4 Discussion

Questionnaires about factor of tourist satisfaction after visiting the Islamic Heritage Park contains 52 items were analyzed using factor analysis. Eigenvalues indicate that items questionnaires containing more than one factor.

After the method of factors analysis had been done, we can conclude that the research could be load by 8 main dimensions. This dimensions namely facilities, monuments, service given by staff, restaurant, transportation, shop (souvenirs, handicrafts), safety and visitors-friendly and last but not least tourist guide. The highest cronbach's alpha value is at the dimension of service given by staff itself with 0.966. This means that all the items in the dimension of service given by staff are reliable to proceed with any statistical analysis. So do with all other items in other dimensions. Only cronbach's alpha value that is greater than 0.5 is accepted and reliable to proceed with statistical analysis. Hence, a total of 8 dimensions existed in this study.

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