Clustering Analysis for Tourism Research: Segmentation Based On Travelers Activities

Imam Djati Widodo, Harwati, Agus Mansur

Universitas Islam Indonesia
e-mail: imamdjati@uii.ac.id, harwati@uii.ac.id, harwati@uii.ac.id

Abstract

Yogyakarta is one of the most promising tourism destinations in Indonesia. This is because Yogyakarta has many supporting aspects as potential natural beauty: the area is rich in ancient sites, and cultural attraction. The purpose of this study is to classify tourists by tourism activities in the area of Yogyakarta. Industry market segmentation in Yogyakarta tourism is expected to provide a description of the type of tourists visiting Yogyakarta as a basis for drafting the products and services in accordance with the wishes of tourist travelers. The result of the anlysis shows taht there are for sluster of tourism in Yogyakarta, tyhe are: established travelers (19%), group travelers (35%), regular travelers (22%) and frugal travelers (24%). Biggest tourist cluster is the group of tourists with typical students, come in large numbers and spending money in small amounts during in Yogyakarta.

Keywords : *Tourism, Clustering, Yogyakarta, Segmentation, K-mean, Activities*

1   INTRODUCTION

Tourism is an industry that is experiencing rapid growth worldwide and has gradually changed from a secondary requirement (luxuries) be a primary requirement (basic needs) which means that at a certain period a person must be able to carry out tourism activities (Putra, 2008). The growth of a particular industry sector would require a sufficiently specific strategy concept on how the services supplied tourist products to offset the desire of the consumer as a connoisseur product. Similarly, the industrial sector in the Special Region of Yogyakarta (DIY). DIY is one of the tourist destinations both locally and overseas beside of Bali, Bandung, Lombok, etc. The arrival of tourists each year continues to increase as shown in Figure 1.

Yogyakarta is one of the most promising tourism destinations in Indonesia. This is because Yogyakarta has many aspects that support them as potential natural beauty, the area is rich in ancient sites, and cultural distinctiveness. Besides, Yogyakarta also has a lot of souvenirs and handicrafts such as batik, silver and pottery with competitive quality. With these forces Yogyakarta has a chance to become one of the important tourist destinations, at the national, regional, and international levels. With a fairly large tourism potential, should be able to attract tourists Yogyakarta greater.

Has done a lot of business and marketing strategies for the attractions in the province, however the marketing effort is still not optimal (Wicaksono, 2013). Refocusing is necessary so that the effectiveness of the marketing strategy could be better (Nuryanti, 2010). To optimize the marketing of the city of Yogyakarta as a tourism product need further study on the characteristics of consumers, which in this case tourists who visit, so in the end the manager of tourism activities, both government and private sector can provide details of all requests related to Yogyakarta tourism activities.

Figure 1: Graph Arrivals DIY 2005-2011 (Source: BPS)

Activities to understand consumers more deeply are also called market segmentation, namely the division of the market into different groups based on the needs, desires, behavior or tastes for different products or services (Day in Onaolapo, 2011). Market segmentation in Yogyakarta tourism industry is expected to provide a description of the type of tourists visiting Yogyakarta as a basis for drafting the tourism products and services in accordance with the desire of tourists.

2 RESEARCH METHODOLOGY

2.1 Research Purpose

The purpose of this study is to tourists grouping tourist based on activities in the area of Yogyakarta. The results will be obtained through this study can be utilized various stakeholders such as local government, other institutions as a basis for consideration in decision making in the management of the tourism industry in DIY.

2.2 Research Method

Some research on the analysis of the tourism industry have been done before from various aspects. Marcel Meler, Dragan Magas, and Duro Horvat (2011) reviewed the literature on tourism industry groupings based group of small and medium industries in the Republic of Croatia. This study concluded that the development of the tourism industry in the Republic of Croatia which is based on the development of small industries is very feasible. This is because small industry is on of the important segment in the development of the national economy. Grouping can be based on several things such as tourist attractions, transportation advice, shopping, hotels, restaurants and so that all of these aspects can be developed into a kind of small industries that benefit society. Chul-Min Mo, Mark E Havitz, and Dennis R

Howard (1994) conducted a study to classify tourists according to a scale that is contained in the International Tourism Role (ITR). The results showed that of the 461 respondents can be grouped into four main clusters based on the socio demographic and travel behavior of tourists. Four clusters are groups of adventurous travelers, tourists who like a new tourist destination, tourist groups who want the convenience and the last group of tourists who like social contact with the environment.

A few years after that, clustering method is also used to classify tourists in the UK. Alzua, et al (1998) classify tourists according to several variables include demographic, travel characteristics, goals and objectives visited most likely to visit, activities involved, tourist philosophy, benefits sought, and habits during the tour. The results showed that there are five groups of tourists were formed, namely cluster teenagers traveled with backpackers, tourists cluster medium families with destination public places, family tourist cluster of old age, with a medium-sized tourist cluster specific tourist destination, and tourists who visit the family clusters.

More specifically Hsueh and Tseng (2012) examines the tourist cluster based on the type of accommodation that is used in the city of Cing Jing Taiwan. The results showed that the factors that influence tourists in choosing among others tranquility accommodation facilities, accessibility, location, and the scenery around the site. Tourist clusters are formed among other tourists who prefer to live in the mountains more than tourists who choose to live in urban areas.

Tourist clusters can also be the first step to develop the tourism potential of a region or country. As found in research Barahi, et al (2011) in the country of Nepal. Tourist cluster aimed at providing a strong foundation for the development of tourism potential in Nepal as one of the poorest countries in the world.

This study is part of a series of studies to develop the concept of Yogyakarta as a tourism city. The grand design of this study is to design the concept of Yogyakarta as a city tour includes a study to analyze public perceptions of tourist arrivals, tourist mapping studies, research to identify potential and tourist facilities and so forth. In this study will be carried out various activities to be able to classify tourists by tourism activities are carried out. Cluster analysis is done to classify tourists by tourism activities undertaken. This is done to determine the segmentation of tourists as consumers of attractions in Yogyakarta so that profiling in industrial policies related to tourism in Yogyakarta will run well.

3 RESULT AND DISCUSSION

3.1 Profile of Respondent

Collecting data in this study is done through the deployment of 250 questionnaires in several tourist destinations in Yogyakarta. Traveler profiles collected are as follow:

3.2 Tourism Cluster

The next calculation is to Yogyakarta traveler grouping based on the profile and the activities conducted. Grouping is done with non-hierarchical clustering method using k-means cluster algorithm with the number of clusters (k) is determined at the beginning of four clusters. Variables used in the clustering process as many as ten (10) variables, namely:

1. Origin Travelers

Table 1: Profile of the Respondent

Nu	Variabel	Result of the Survey
1	Gender	Man: 56.2%
		Women: 43.2%
	Age	15-20 years old: 35.2%
		>20-30 years old: 54.4%
		>30-40 years old: 6%
		>40-50 years old: 2.8%
		> 50 years old: 1.6%
2	Origin	Middle Java: 37.6%
		West Java and Jakarta: 24.8%
		East Java: 14%
		Outside Java: 19.2%
		Etc: 4.4%
3	Occupation	Student: 58.8%
		Civil Staff: 17.2%
		Trader: 1.2%
		Bussinessman: 12.8%
		Etc: 10%
4	Income per month	0mil -5mil: 81.6%
		>5mil -10mil: 12%
		>10mil -15mil: 2.8%
		>15mil 20mil: 2.4%
		> 20 mil: 1.2%
5	Frequency per year	Once: 10.8%
		Twice: 14.8%
		Three times: 8.4%
		Four times: 10.8%
		Etc : 55.2%
6	Duration of Vacation	< 3 days: 59.2%
		1 Week: 25.2%
		2 Weeks: 2.8%
		1 Month: 2.4%
		¿ 1 month: 10.4%
7	Community in Vacation	Alone: 8.8%
		Friends: 50%
		Family: 31.5%
		Group: 4%
		Etc: 5.6%
8	Budget	< 2 mil: 62.8%
		2 <3mil: 18.4%
		3 - ¡4 mil: 8.8%
		4 5 mil: 3.6%
		> 5 mil6.4%
9	Accomodation	Family: 38.4%
		Star Hotel: 14%
		Cheap Hotel: 11.6%
		Homestay: 12.4%
		Etc: 23.6%
10	Transportation	Private Car: 46.4%
		Rent Car: 22%
		Taxi: 9.2%
		Public Transport: 13.6%
		Etc: 8.8%
11	Fovourite Destination	Natural: 34.4%
		Shopping: 26.4%
		Food: 9.05%
		Local People: 6.8%

2. Work Travelers

3. Revenue Travelers

4. Frequency

5. Duration Travelers

6. Accomodation

7. Transportation Travelers

8. Budget Travelers

9. Interest Travelers

10. Community on Vacation

From the initial output of SPSS 16 above can be concluded that the data used for the formation of clusters is valid then later clustering process is done. By using the k-means cluster algorithm obtained results are presented in the following figure 2:
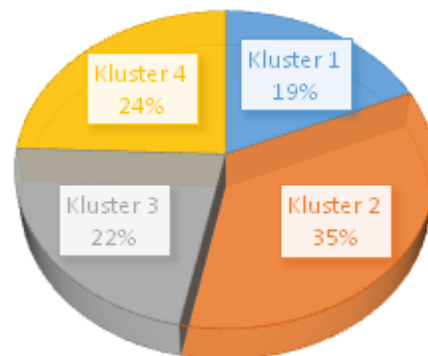

Figure 2: Result of Clustering

Respondents were used as input in this research is the data tourists who come to Yogyakarta with a variable that is used as a criterion pengkluster consists of origin of tourists, tourists job, tourist income, frequency of visits, length of tourist visits, lodging, transportation of tourists, budget travelers, tourist attraction , and tourist communities. Respondents were then grouped based on existing criteria. The amount of data used is 250 data.

At this early stage in the method of "K-Means Cluster" begins by determining in advance the number of desired clusters. In this study used cluster number is 4 cluster. Based on the ten criteria used, traveler profiles formed four major groups as follows:

1. Cluster 1. Consists of 46 respondents or 19% of the total respondents. In this group contains most of the tourists who come from areas outside of Java that works as a self-employed with incomes between 5-10 million per month. In a year, this cluster could visit Yogyakarta three times with an average spend a week during in Yogyakarta.

The visit is usually done with the family and spend 3-4 million dollars for a visit, stay in hotels and using charter transportation to visit another area of the area of unity mainly to natural attractions. Viewing of profiles generated clusters, cluster "established tourists" is the right name to describe the characteristics of the tourist group.

2. Cluster 2. Consists of 87 respondents or 35% of the total respondents. In this group contains most of the tourists who come from Central Java and West Java are still a student or students. Income below 5 million per month. The frequency of visits could not be determined. However, in a single visit can spend 3 days to 1 week. Most stay in the middle class and visited attraction in the form of natural attractions and shopping. The tourist group was also staying at the hotel and using charter transportation to visit unity area to another. Viewing of profiles generated clusters, clusters of "tourist group" is the right name to describe the characteristics of the tourist group.

3. Cluster 3. Consists of 55 respondents or 22% of the total respondents. In this group contains most of the tourists who come from Central Java and West Java who work as employees with incomes between approximately 5 million per month. Within a year of this cluster group average visit Yogyakarta by more than three times the average spend a week during in Yogyakarta. The visit is usually done with the family and spend 2-3 million dollars during the visit, the usual hotel stays and using charter transportation to visit the entire attractions object in Yogyakarta, such as nature tourism, shopping tourism, cultural tourism, etc. Viewing of profiles generated clusters, cluster "ordinary tourists" is the right name to describe the characteristics of the tourist group.

4. Consists of 61responden or 24% of the total respondents. In this group contains most of the tourists who come from the Central Java and East Java who work as employees with incomes between under 5 million per month. In a year, this cluster can only visit Yogyakarta 0nce-twice with an average spend between three days to a week for at Yogyakarta. The visit is usually done alone or together and spend 1-2 million dollars for a visit, stay in your home or hotel class jasmine and using charter transportation to visit another area of the area of unity especially to attractions shopping. Viewing of profiles generated clusters, cluster "frugal traveler" is the right name to describe the characteristics of the tourist group.

Furthermore it can be seen that there is a unique character that appears in each cluster after profiling.

- That is: Travelers who come from outside the island of Java, it turns more included in the established tourist groups who spend a lot of money to travel in Yogyakarta.

- Travelers group mostly from areas in Central Java and West Java. This group came role in large quantities, but only spend a little money for in Yogyakarta.

- Natural and shopping object shopping is visited by almost all groups / clusters of tourists.

4 CONCLUSION

From the analysis of the application cluster technique in finding the characteristic pattern of tourists visiting Yogyakarta can be concluded that there are four clusters are formed based on ten criteria: established travelers (19%), group travelers (35%), regular travelers (22%) and frugal travelers (24%). Biggest tourist cluster is the group of tourists with typical students, come in large numbers and spending money in small amounts during in Yogyakarta.

5 ACKNOELEDGMENT

References

Dinardani Ratrisari, Hadi Wahyono, (2012), Kontribusi Obyek Wisata Di Kota Yogyakarta Terhadap Pendapatan Asli Daerah (PAD), *Jurnal Tata Loka*; Volume *5*; Nomor 1, Universitas Diponegoro, Semarang.

Marcel Meler, Dragan Maga, Duro Horvat, (2011), The SMEs Role in the Tourism Industry Cluster Formation in the Republic of Croatia, *TMC Academic Journal, 5(2)*: page 24-33.

Chul-Min Mo, Mark E Havitz, dan Dennis R Howard , (1994), Segmenting Travel Markets with the International Tourism Role (ITR) Scale, *Journal of Travel Research 1994*; 33; page 24.

Hsueh Ya-Hui Tseng, Hsiu-Yuan, (2012), Exploring the Clustering Location of Accommodation Units through the Tourism Development in the Cing Jing area of Taiwan, *International Journal of Basic & Applied Sciences IJBAS-IJENS* Vol:*13* No:04

Barahi Shraddha, Fan Rui Hung Phoebe, MallaPukar, YeungRaymond, (2011),*Tourism Cluster in Nepal Microeconomics of Competitiveness*, Harvard Bussiness School, USA.

AlzuaAurkene,Leary T.O Joseph, Morrison M Alastair, (1998),Cultural and Heritage Tourism: Identifying niches for international Travelers, *The Journal Of Tourism Studies* Vol. *9*, No. 2

IordacheCarmen, CiochinIuliana, AsandeiMihaela, 2010, Clusters -Tourism Activity Increase Competitiveness Support, T*heoretical and Applied Economics Volume XVII (2010)*, No. *5*(546), pp. 99-112

Kartajaya, H., (1998), *Marketing Plus 2000: Siasat Memenangkan Persaingan Global*, Gramedia, Jakarta

Kotler, P. & Amstrong, G. 91997), *Prinsip-prinsip Pemasaran*, Penerbit Erlangga, Surabaya

Nuryanti, W., (2010), Strategi pemasaran pariwisata diy tahun 2010, *http://www.slideshare.net/EddyPurnomo/strategi-pemasaran-pariwisata-diy-prof-wiendu* (accessed 1/16/2014)

Putra D.C Kadek, (2008), Strategi Public Relations Pariwisata Bali, *Jurnal Ilmu Komunikasi Volume 5, Nomor 1.*

Pemerintah Republik Indonesia, (2009), *Undang-undang Pariwisata No 10 Tahun 2009.*

Oyelade, O. J, Oladipupo, O. O, Obagbuwa, I. C, (2010), Application of k-Means Clustering algorithm for prediction of Students *Academic Performance, International Journal of Computer Science and Information Security*, Vol. 7

Setiadi, N. J., (2008), *Perilaku Konsumen: Konsep dan Implikasi untuk Strategi dan penelitian Pemasaran*, Kencana, Jakarta

Wicaksono Soni, (2013), *Pengembangan Pasar Pariwisata Jogja Masih Terbuka*, SuaraMerdeka.

Onaolapo A. A., Salami A. O, Oyedokun A. J, (2011), Marketing Segmentation Practices and Performance of Nigerian Commerical Banks, *European Journal of Economics, Finance and Administrative Sciences* ISSN 1450-2275 Issue 29.