




# Strategic Formulation for Market Segmentation in Tourism: Key Influencers in Selecting of Kayangan Api as a Destination

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**Abstract.** Kayangan Api is one of the tourist destinations in Bojonegoro Regency. The number of tourists on Kayangan Api tours starting from 2018 to 2022 tends to decrease. There are several factors that cause the decline, such as the absence of public transportation and lack of promotion from the management. There needs to be adjustments made by the manager in adapting to attract tourists. Kayangan Api tourists have a variety of backgrounds, characteristics, needs and goals that influence decisions in choosing tourist destinations, so there is a need for a marketing strategy in the segmentation of the tourist market from Kayangan Api tourism. The methods used are factor analysis, cluster analysis, and SWOT analysis. In the factor analysis, the results were 8 factors that influenced the decision of tourists to visit Kayangan Api tourism. In the cluster analysis, the results were the formation of 3 clusters (market segmentation) of tourists. In the SWOT analysis, results were obtained in the form of marketing strategies based on internal factors (strengths and weaknesses), and external factors (opportunities and threats) from Kayangan Api tourism.

**Keywords:** Factor Analysis, Cluster analysis, SWOT Analysis.

## 1 Introduction

Tourism is one of the basic needs of human life to achieve balance in life and prosperity. Tourism can have an impact on the growth of the world economic sector, this is because tourism involves many people, including tourists, tourism business people, professional staff, educational institutions and the wider community. Tourism is one of the supporters of change that creates new challenges and opportunities that can give rise to new ideas, new knowledge and creativity. Currently tourism has been used as a driving engine for the growth of aspects of life such as industry, economy, creative industries and social mobility. Tourism has become an important factor in the process of economic development and social welfare, this is because the tourism sector can create jobs and new businesses. Information shows that up to 2017 the tourism industry in Indonesia had grown 22 percent, much higher by 7 percent above the growth of the tourism industry in other ASEAN countries [1].

The utilization and improvement of Tourist Destination Areas (DTW) greatly influences the progress of the tourism industry in a region. This is because the more tourist attractions there are, the more tourists will visit, so that it can help the economic growth of the surrounding community. Bojonegoro Regency is one of the regencies in East Java Province which has quite a lot of potential tourist attractions ranging from natural tourism to artificial tourism. The tourism potential of Bojonegoro Regency will help in efforts to increase regional income sources [2].

In Bojonegoro Regency there are 39 tourist destinations spread out, namely 21 natural tourism destinations, 4 tourist tourism locations, 2 educational tourism locations, 4 religious tourism locations, 6 recreational tourism locations, and 2 historical tourism locations. Examples of natural tourism are Kayangan Api, Pacal Reservoir, Bendo Reservoir and others. In Bojonegoro there is also agro tourism, namely Starfruit Agrotourism and Padang Jambu Argotourism, and others. There are also recreational tourism, namely Go Fun, Dander Waterpark, and so on. There are also religious tours such as Wali Kidangan, and historical ones such as the Samin Community Tour. In general, tourism in Bojonegoro Regency is mostly natural tourism. Of all the tourist destinations in Bojonegoro Regency, there are three favorite tourist attractions with the highest number of tourists, namely Go Fun tourism, Dander Waterpark and Starfruit Agrotourism. In 2022, the number of tourists visiting the three tourist attractions, namely Go Fun, will be 881,889 people, Starfruit Agrotourism will be 74,487 people, and Dander Waterpark will be 36,192 people [3].

Kayangan Api is one of the tourist destinations in Bojonegoro Regency. Kayangan Api is a natural tourist attraction that offers the beauty of an eternal source of fire that never goes out. Kayangan Api Tourism is located in a protected forest area in Sendangharjo Village, Ngasem District, Bojonegoro Regency. The Kayangan Api tourist complex is a natural geological phenomenon in the form of the release of natural gas from the ground which is ignited by fire, resulting in a fire that never goes out even if it rains. The number of tourists on the Kayangan Api tour from 2018 to 2022 tends to decrease. In 2018 the number of tourists at Kayangan Api was 52,046 people, it increased in 2019 but in the following year it decreased until in 2022 the number of tourists was 35,574 people. There are several factors that have caused a decline in the number of tourists at Kayangan Api, including the emergence of contemporary tourist attractions that are of interest to young people (either new tourism or renewal of old tourism), the lack of interest of today's young people in natural and historical tourism such as Kayangan Api, the absence of public transportation that can reach the Kayangan Api tourist attraction, and the lack of promotion from the management [3].

Kayangan Api is a tourism icon in Bojonegoro Regency, therefore there needs to be adjustments made by the management in adapting to attract more tourists to visit Kayangan Api. Visitors from the Kayangan Api tourist destination have various backgrounds, characteristics, needs and goals that influence their decisions in choosing their tourist destination. Researchers have the idea to design a strategy formulation for segmenting the tourist market for Kayangan Api tourism, by first determining the factors that influence tourists in choosing the Kayangan Api tourist destination using factor analysis and forming tourist segmentation using cluster analysis. After the formation of tourist segmentation, appropriate marketing strategies will be formulated based on this

segmentation for Kayangan Api tourism using SWOT analysis. It is hoped that this research can help Kayangan Api in developing tourist destinations and improving the tourism management system in accordance with the characteristics and needs of tourists so that it can increase the number of tourists visiting. Therefore, the objectives of this research are including identifying factors that influence tourists' decisions in choosing Kayangan Api as a tourist destination in Bojonegoro, determine the market segmentation of tourists on the Kayangan Api tour and determine marketing strategies for Kayangan Api tourism based on tourist market segmentation.

## 2 Research Methods

### 2.1 Population and Sample

Sampling if the number of the population as a whole is unknown is with a sample size of more than 30 and less than 500 samples [4]. Because the population in this study is unknown, according to [5] so, to calculate the number of samples in an unknown population use the Paul Leedy formula. if  $n$  is the sample size,  $Z$  is the selected standard error,  $e$  is the sampling error (10%) and  $P$  is the population size, then the Paul Leedy formula is found in equation (1).

$$n = \left(\frac{Z}{e}\right)^2(P)(1 - P) \quad (1)$$

This research uses a confidence level of 95% and an accuracy level of 5% to obtain a  $Z$  value of 1.96, and then an error rate of no more than 10%. Due to the unknown population size, the maximum  $(P)(1-P)$  value is 0.25. Therefore, the minimum number of samples taken is as follows:

$$n = \left(\frac{Z}{e}\right)^2(P)(1 - P) = \left(\frac{1,96}{0,1}\right)^2(0,5)(1 - 0,5) = (384,16) (0,25) = 97 \text{ people}$$

Based on the calculations above, the minimum number of samples taken was 97 people.

### 2.2 The Variables of Market Segmentation

Referring to Table 1, the following are the questionnaire variables for market segmentation.

**Table 1.** Market segmentation variables.

| Types of segmentation    | Variable | Variable name |
|--------------------------|----------|---------------|
| Demographic Segmentation | $X_1$    | Gender        |
|                          | $X_2$    | Age           |
|                          | $X_3$    | Occupation    |

|                            |                 |                                   |
|----------------------------|-----------------|-----------------------------------|
| Geographic Segmentation    | X <sub>4</sub>  | Regional origin                   |
| Psychographic Segmentation | X <sub>5</sub>  | tourism expenditure               |
| Behavioral Segmentation    | X <sub>6</sub>  | Duration of tourism               |
|                            | X <sub>7</sub>  | The intensity of tourism          |
|                            | X <sub>8</sub>  | Timing of tourism                 |
|                            | X <sub>9</sub>  | Travel companion                  |
|                            | X <sub>10</sub> | The source of tourism information |
|                            | X <sub>11</sub> | Ticket purchasing                 |
|                            | X <sub>12</sub> | Parking facilities                |

### 2.3 The Variables of Travel Decision Factor

Referring to Table 2, the following are the main questionnaire variables for respondents which aim to identify factors that influence tourists decisions in visiting a tourist destination.

**Table 2.** The Variables of travel decision factor.

| Variable        | Variable name  | References |
|-----------------|--|------------|
| Y <sub>1</sub>  | Personality  | [6]        |
| Y <sub>2</sub>  | Personal health  |            |
| Y <sub>3</sub>  | Income level   |            |
| Y <sub>4</sub>  | Commitment to work   |            |
| Y <sub>5</sub>  | Commitment to family   |            |
| Y <sub>6</sub>  | Lifestyle  |            |
| Y <sub>7</sub>  | Current knowledge about tourist destinations                                 |            |
| Y <sub>8</sub>  | Hobbies and interests  |            |
| Y <sub>9</sub>  | Past experience  |            |
| Y <sub>10</sub> | Tour package prices  |            |
| Y <sub>11</sub> | Tourist destination information from tourism organizations and travel agents |            |
| Y <sub>12</sub> | <i>Words of mouth</i>  |            |
| Y <sub>13</sub> | Political and security conditions  |            |
| Y <sub>14</sub> | Environmental hygiene conditions   |            |
| Y <sub>15</sub> | Special promotions from travel agents  |            |
| Y <sub>16</sub> | Weather and climate  |            |
| Y <sub>17</sub> | Attitudes, opinions and perceptions  |            |
| Y <sub>18</sub> | Availability of tourist objects and products                                 |            |
| Y <sub>19</sub> | Transportation and road access   |            |
| Y <sub>20</sub> | Main and supporting facilities   |            |
| Y <sub>21</sub> | <i>Events</i> and entertainment  |            |
| Y <sub>22</sub> | Many places capture tourist moments  |            |
| Y <sub>23</sub> | The image of the tourist destination is good                                 | [7]        |

|                 |   |     |
|-----------------|---|-----|
| Y <sub>24</sub> | View photos of tourist destinations on social media       |     |
| Y <sub>25</sub> | Attractive tourism promotions                             |     |
| Y <sub>26</sub> | Place design  | [8] |
| Y <sub>27</sub> | Employee courtesy   |     |
| Y <sub>28</sub> | Employee friendliness                                     |     |
| Y <sub>29</sub> | Entrance fees to tourist attractions are relatively cheap | [9] |
| Y <sub>30</sub> | Information that is easy to obtain                        |     |

## 2.4 Analysis Method

This research uses his research uses three analysis methods, namely cluster analysis, factor analysis and SWOT analysis. In the factor analysis, this research uses the Confirmatory Factor Analysis (CFA) method. According to [10], confirmatory factor analysis is a factor analysis technique where the factors are known beforehand and the variables related to the factors have been determined first. According to [11], in cluster analysis, samples will be grouped based on their similarities. The following are the stages of the cluster analysis process. They are the clustering process uses the K-Means Cluster method, carry out planting from the clusters that have been formed and validating and profiling clusters using Crosstabulation. Cluster profiling contains. According to [12], the stages in a SWOT method are analyze and determine strategic decisions using the SWOT matrix approach and analyze the results of the SWOT.

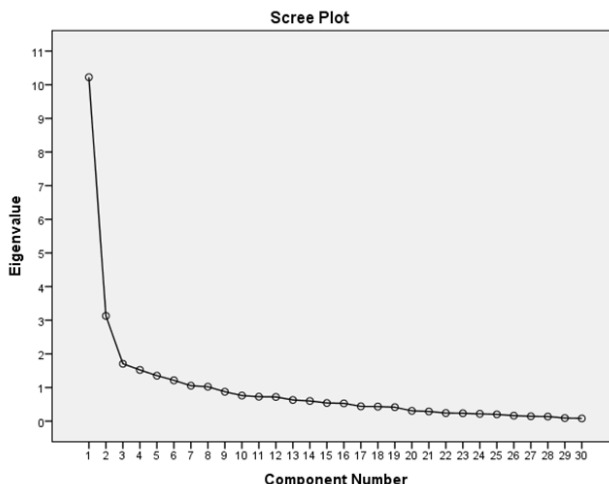
## 3 Result and Discussion

The first stage of factor analysis is to carry out the KMO test, Bartlett's test, and MSA. The KMO test, Bartlett's test, and MSA are used to determine the feasibility of the variable, whether the variable can be processed further using factor analysis or not. Table 3. is the result of the KMO test, Bartlett's test, and MSA.

**Table 3.** Result of the KMO test, Bartlett's test, and MSA.

| KMO and Bartlett's Test                          |                    |          |
|--|--------------------|----------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. |                    | 0,824    |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square | 1993,266 |
|  | df                 | 435      |
|  | Sig                | 0,000    |

Based on Table 3, it is known that the results obtained are the Kaiser Meyer Olkin Measure of Sampling Adequacy value of 0.824 which is greater than 0.50. Meanwhile, the Bartlett's Test of Sphericity (Sig.) value is 0.000, which is smaller than 0.05. So it can be concluded that the variable is feasible and can be processed further using factor analysis. *Scree plot* is a stage of factor analysis that has the same use as total variance explained. Scree plots are useful for showing the number of factors formed using graphic image visualization. The result of the scree plot is in figure 1.



**Fig. 1.** Scree plot results

Based on Figure 1, it can be seen that there are 8 factors out of 30 factors that have total eigenvalues greater than 1. Meanwhile, starting from the ninth factor onwards, the total eigenvalues are smaller than 1. Therefore, the number of factors formed is 8 factors. Factor rotation is a stage in factor analysis that is useful for determining which variable will fall into which factor group. The determination of a variable to be included in the factor group which can be seen from the largest correlation value. This determination is seen from the largest correlation value possessed by the variable. For example, the personality variable has the largest correlation value on the seventh factor, namely 0.729. This means that the personality variable is included in the seventh factor.

Factor interpretation is the final stage of factor analysis. At this stage, names will be given to the factors formed to represent the variables that are members of the factor (Table 4).

**Table 4.** Interpretation of factors.

| Factor                   | Variable codes (loading factor)  |
|--------------------------|--|
| Service                  | X <sub>26</sub> (0.661); X <sub>27</sub> (0.843); X <sub>28</sub> (0.860); X <sub>29</sub> (0.596); X <sub>30</sub> (0.720)                          |
| Accessibility            | X <sub>11</sub> (0.523); X <sub>12</sub> (0.536); X <sub>16</sub> (0.721); X <sub>19</sub> (0.628); X <sub>20</sub> (0.662); X <sub>21</sub> (0.697) |
| Exploration              | X <sub>6</sub> (0.518); X <sub>7</sub> (0.678); X <sub>8</sub> (0.79); X <sub>9</sub> (0.519); X <sub>10</sub> (0.574)                               |
| Security and Safety      | X <sub>13</sub> (0.780); X <sub>15</sub> (0.699)   |
| Attractiveness           | X <sub>22</sub> (0.570); X <sub>23</sub> (0.615); X <sub>24</sub> (0.711); X <sub>25</sub> (0.490)   |
| Motivation               | X <sub>3</sub> (0.733); X <sub>4</sub> (0.820); X <sub>5</sub> (0.695)   |
| Personal Characteristics | X <sub>1</sub> (0.729); X <sub>2</sub> (0.772)   |
| Environmental conditions | X <sub>14</sub> (0.602); X <sub>17</sub> (0.528); X <sub>18</sub> (0.466)  |

Based on Table 4, the factors formed from the results of factor analysis can be seen. The interpretation of this factor was obtained from the results of factor rotation that had

been carried out previously. The results obtained were the formation of 8 new factors that could represent these variables. The factors formed include service factors, accessibility, exploration, security and safety, attractiveness, motivation, personal characteristics, and environmental conditions.

The k-means cluster method is used to group data based on distance and divide the data into certain groups. In this study, the number of clusters determined was three clusters. The ANOVA test is useful for seeing the differences in the variables in each cluster formed. This can be known by looking at the F value and its significance value. The greater the F value and the significance value smaller than 0.05, the greater the difference in the variables in each cluster formed. The hypothesis of the ANOVA test is as follows.

$H_0$ : Each cluster does not have significant differences.

$H_1$ : Each cluster has significant differences.

- a) If the significant number is  $> 0.05$ ; then accepted  $H_0$  and rejected  $H_1$
- b) If the significant number is  $< 0.05$ ; then rejected  $H_0$  and accepted  $H_1$

The ANOVA test result shows that there are 4 variables which have a large F value and a significance value smaller than 0.05, namely the occupation (0.000), tourism expenditure (0.000), the intensity of tourism (0.000) and the source of tourism information (0.014). This shows that in each cluster there are significant differences based on the variables of the occupation, tourism expenditure, the intensity of tourism and the source of tourism information. Number of cases in each cluster is one of the stages in cluster analysis which is useful for knowing the number of members of each cluster formed. Cluster 1 has the number of members 67 respondents, followed by cluster 2 with 27 and cluster 3 with 18 respondents. The next step is to determine the tourist market segmentation of each cluster formed (Table 5).

**Table 5.** Tourist market segmentation for the Kayangan Api tourist destination

| Clusters | Characteristics  |
|----------|--|
| 1        | Tourists have characteristics with occupation as students and tourist expenditure below Rp. 100,000. Tourists in this cluster travel more with an intensity of 1 time a year. The source of tourist information used by tourists in choosing Kayangan Api tourist destinations is dominated by friend recommendations and social media.  |
| 2        | Tourists in this cluster are dominated by private employees and entrepreneurs. Travel expenditures of these tourists are mostly below Rp. 100,000 and Rp. 100,000 - Rp. 400,000. Tourists in this cluster travel more with an intensity of 3 times and more than 5 times a year. The source of tourist information used by tourists in choosing Kayangan Api tourist destinations is dominated by social media and half of them are from friends' recommendations. |
| 3        | The characteristics of tourists in this cluster are working as students. Travel expenses for these tourists are mostly below Rp. 100,000 and travel more than 5 times a year. Sources of tourist information used by tourists in   |

choosing Kayangan Api tourist destinations are friends' recommendations and social media.

Before entering the SWOT analysis stage, the researcher conducted interviews with the management for the validation process and determined which of the 8 factors that had been obtained from the factor analysis into the internal or external factors possessed by Kayangan Api tourism. After determining the internal and external factors that the Kayangan Api tourism has, the next process is to determine the market segmentation that will be chosen to design a marketing strategy. The tourist market segmentation formed at the Kayangan Api tourist destination consists of three clusters (segments). Of the three tourist market segments for the Kayangan Api tourist destination, not all market segmentations (clusters) will have marketing strategies determined. Cluster one of the tourist market segmentation for the Kayangan Api tourist destination will be selected to determine its marketing strategy. This is because cluster one is considered to represent the tourist market segmentation of the Kayangan Api tourist destination as a whole, because it has the largest number of tourists compared to other clusters. Table 6 is a SWOT matrix approach for Kayangan Api tourism.

**Table 6.** SWOT matrix for Kayangan Api tourism.

|  | Strength(S)  | Weakness (W)   |
|--|--|--|
| SWOT Analysis  | 1.It has good service to customers<br><br>2. Safe tourist attractions and prioritize tourist safety<br><br>3. Tourist attractions have a clean environment.  | 1.Lack of information about tourist destinations and limited transportation, road access, and facilities.<br><br>2.Lack of photo spots, and tourism promotion. |
| Opportunities (O)  | SO Strategy  | WO Strategy  |
| 1. Hobbies and interests, and past experiences.                                    | 1. Maintain the quality of services provided to tourists   | 1.Create an official website and social media accounts to provide information on Kayangan Api tours  |
| 2. Tourist attractions for family or work colleagues and according to income level | 2. Optimizing existing resources and working together between managers, government, and the community in maintaining tourist destinations.<br><br>3. Maintaining the level of security and safety for visiting tourists so that it | 2. Improving road access and street lighting to tourist destinations.<br><br>3. Increase promotion of Kayangan Api tourist destinations through social media   |



|   |   |   |
|---|---|---|
|   | becomes a family-friendly tourist spot.                                       |   |
|   | 4. Maintain and preserve the environment inside or around tourist attractions |   |
| Threats (T)   | ST Strategy   | WT Strategy   |
| 1. Personal characteristics (personality and personal health) | 1. Maintain affordable entrance fees to tourist destinations                  | 1. Increase promotion to social media to provide information Kayangan Api tourism destination                     |
| Demographic Segmentation                                      | 2. Maintain the level of environmental hygiene of tourist attractions         | 2. Improve and repair the facilities such as prayer room, parking facilities, toilets, sinks and other facilities |

## 4 Conclusion

The conclusions obtained from this research are as follows:

1. The results of factor analysis provide the results of the formation of 8 factors that influence tourist decisions in choosing Kayangan Api as a tourist destination in Bojonegoro. These factors are service factors, accessibility factors, exploration factors, security and safety factors, attraction factors, motivation factors, personal characteristics factors, and environmental condition factors.
2. The results obtained were the formation of 3 tourist market segments (clusters) at the Kayangan Api tourist destination from 112 total tourists. In cluster one there are 67 tourists, in cluster two there are 27 tourists, and in cluster three there are 18 tourists. Tourists have characteristics with occupation as students and tourist expenditure below Rp. 100,000. Tourists in this cluster travel more with an intensity of 1 time a year. The source of tourist information used by tourists in choosing Kayangan Api tourist destinations is dominated by friend recommendations and social media.
3. The process of determining the marketing strategy for Kayangan Api tourism is designed based on tourist market segmentation using the SWOT analysis method. SWOT analysis is only applied to cluster one of the Kayangan Api tourist market segmentation.

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## References

1. Poerwanto, P., Shambodo, Y.: Industrial revolution 4.0: Googleization of the tourism industry and creative industries. *Journal of Tourism and Creativity* 4, 59-72(2020).
2. Wiraloka, P., Mukzam, M. D.: The Role of the Culture and Tourism Service in the Development of Tourist Attractions (Study on the Development of the Kayangan Api Tourist Attraction by the Bojonegoro Regency Culture and Tourism Office). Brawijaya University (2017).
3. Bojonegoro, D.K.d.P.K.: One Bojonegoro Data. Available: <https://data.bojonegorokab.go.id/dinas-kekulturandan-pariwisata.html@detail=destinasi-wisata> (2023).
4. Wahyuni, S., Anggriani, I. Putra, I. U.: Analysis of Factors Affecting Visiting Decisions at Buana Alit Tourism Central Bengkulu, Central Bengkulu. *EKOMBIS REVIEW: Scientific Journal of Economics and Business* 10, 379–390 (2022).
5. Sudrartono, T.: The Influence of Market Segmentation on Sales Levels of MSE Fashion Products: Case Study of MSEs in Bumi Orange Cinunuk Bandung, "Coopetition: Management Scientific Journal 10, 53-64 (2019).
6. Yusendra, A. E.: Analysis of factors that influence decisions selection of tourist destinations for domestic tourists in the archipelago. *Journal Darmajaya Master Management*, 1(01), 46-64 (2015).
7. Yofina, M.: Analysis of Factors Affecting the Decision Visiting Domestic Tourists Viewed from the Perspective of Attractiveness Tourism Destinations of Bukittinggi City. *Menara Ilmu*, 13(1) (2019)
8. Pratama, I. G. S., Wiraguna, I. M. I.: Analysis of Factors that Influencing Tourist Decisions to Visit Bali Zoo in Singapadu, Gianyar. *Warmadewa Management and Business Journal (WMBJ)*, 1(1), 45-54 (2019).
9. Andina, S. A., Aliyah, I.: Factors Affecting Tourist Interest Tourists in Visiting Borobudur Temple Cultural Tourism. *Cakra Wisata*, 22(1) (2021).
10. Erlangashani, C., FM Suarka, F.M., Pertiwi, P. R.: Factors that determine the occurrence of an employee promotion system at Masari Villas and Spa. *Engineer*, vol. 2, 4(2021).
11. Talakua, M.W., Leleury, Z.A., Taluta, A.: Cluster analysis using the k-means method for grouping regencies/cities in Maluku province based on the 2014 human development index indicators, "BAREKENG: *Jurnal Ilmu Matematika dan Terapan*, vol. 11, 119-128 (2017).
12. Afriani, S., Susanti, N.: Analysis of marketing strategies for historical tourism (Bung Karno's house and Fatmawati's house) in the city of Bengkulu, "EKOMBIS REVIEW: Scientific Journal of Economics and Business. 5 (2017).

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