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TOURIST CLUSTER ANALYSIS FOR THE DEVELOPMENT OF KE'TE' KESU' TOURISM OBJECT

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Abstract

This study aims to analyze the clustering of tourists visiting the Ke'te' Kesu' tourist attraction to support the development of more effective marketing strategies and tourism services. The research employs a K-Means clustering algorithm, which groups tourists based on their socio-economic characteristics and visit preferences. Data were collected through questionnaires distributed to tourists during a specific period. The analysis results indicate that tourists are divided into two main clusters. Cluster one (C1) consists of high-income to very high-income tourists who tend to seek exclusive and premium travel experiences. Cluster two (C2) includes the majority of tourists who are students with low to very low incomes, preferring educational tourism and affordable access. The implications of this study suggest that tourism managers should offer customized travel packages tailored to each cluster, such as premium services for high-end tourists and educational programs for students. Additionally, infrastructure improvements, sanitation facilities, and digital marketing optimization are key recommendations to enhance Ke'te' Kesu's appeal as a cultural tourism destination.

INTRODUCTION

The tourism sector in Indonesia has long been one of the main pillars supporting the country's economy. The extraordinary natural potential, abundant cultural wealth, and deep historical heritage make Indonesia an attractive destination for tourists, both domestic and international. The large number of tourists visiting tourist attractions in Indonesia has many positive impacts, especially in the economic and development sectors of a region (Paramitasari, 2018). North Toraja is one of the areas in South Sulawesi Province that has beauty and uniqueness, thus attracting various groups of tourists to visit this area. The main attraction of this area lies in the combination of stunning natural panoramas, such as green hills and rock cliffs, as well as strong cultural traditions, such as the Tongkonan traditional house, the Rambu Solo ritual, and typical Toraja carvings.

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Many tourists come to enjoy this unique experience, either for recreation, education, or historical exploration purposes. Tourist visits to Ke'te' Kesu' increased rapidly from 53,810 people (2021) to 123,429 people (2023). Despite showing strong appeal, the management of this destination faces challenges in understanding the characteristics and behavior of tourists. Through tourist cluster analysis, tourism development strategies can be more targeted, both in improving facilities, promotions, and economic opportunities for local communities. Therefore, this research is important to support the sustainability of Ke'te' Kesu' as a leading tourist destination.

This phenomenon shows that the Ke'te' Kesu' area has a strong appeal, both in terms of cultural uniqueness such as the Tongkonan traditional house, typical Toraja carvings, and the Rambu Solo tradition, as well as in terms of natural beauty and historical value. However, amidst the increasing number of tourist visits, the challenges in managing tourism are increasingly complex. One of these challenges is understanding the characteristics of tourists based on demographics, purpose of visit, and tourism behavior. A deep understanding of the characteristics and behavior of tourists will help tourism managers and the government in developing more effective and targeted development strategies. By knowing the behavior patterns of tourists, more specific recommendations can be given, such as improving facilities, developing tourist attractions, and more appropriate promotions. This is important because each group of tourists has different interests, goals, and expectations in enjoying tourist destinations such as Ke'te' Kesu'.

LITERATURE REVIEW

Tourism Management

Tourism is a complex activity and can be seen as a large system that includes various components, such as economic, ecological, political, social, cultural, and other aspects (Rusyidi & Fedryansah, 2018). Tourism development is the process of growth and development of tourist destinations that involves the management of various aspects, such as transportation, accommodation, infrastructure, tourist objects and attractions, visitor services, and other elements that are closely related to community life. The development of a tourist attraction is greatly influenced by the decision of tourists to visit, which is driven by the attractions of the tourist attraction.

Tourism Marketing

Tourism marketing is a coordinated system and policy for companies or tourism industry groups, both from the private sector and government, at the local, regional, national, and international levels. Tourism marketing is also the process of identifying the needs, desires, and interests of the target market and providing more optimal and efficient satisfaction compared to competitors.

Tourist Cluster

Tourist clusters are a significant approach in tourism destination management to identify visitor behavior, preferences, and needs. By grouping tourists based on characteristics such as age, origin, purpose of travel, or activities of interest, managers can design more relevant and effective development strategies. The indicators of visitor characteristics are City or area of origin is the area where the respondent lives, Age is the age of the respondent at the time of the survey, Gender which is grouped into male and

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female, Respondent education level, Respondent employment status, Respondent monthly income, Average expenditure made by tourists (Nengsih & Ariska, 2020).

Cluster Analysis

Cluster analysis is one of the techniques in multivariate analysis that aims primarily to group objects based on the similarities in their characteristics (Alwi & Hasrul, 2018). Clustering or cluster analysis is the process of grouping data into groups (clusters) based on a set of data whose categories or classes are not yet known. This process aims to determine which cluster is appropriate for each data. Clustering is used to identify taxonomic categories, bacteriology, or topological patterns in the available data. Cluster analysis has a number of advantages and disadvantages that need to be considered (Talakua et al., 2017):

1. Clustering is able to group large amounts of observation data with many variables, thus facilitating the research process. In addition, this method can use various types of measurement scales, such as ordinal, interval, and ratio.
2. The weakness of observation data that has heterogeneous nature between one research object and another can make it difficult for researchers to determine the number of groups to be formed. In addition, classification tends to be subjective because it is only based on dendogram observations. Significant differences in results due to the method used can trigger comparisons between methods. In addition, the greater the number of observations, the higher the risk of errors.

Data Mining

Data mining is an iterative and interactive process to identify new patterns or models that are accurate, useful, and easy to understand in large databases.

K-Means Method

K-Means is a method for clustering data where each data point is placed in a cluster based on the level of proximity or membership to a particular cluster center. The K-Means method aims to group data into several groups, where data in one group has characteristics that are similar to each other and different from the characteristics of data in other groups (Tamba et al., 2019).

Orange Data Mining

The K-Means method is implemented using data mining software called Orange Data Mining. Orange Data Mining is a component-based visual programming software used for data visualization, machine learning, data mining, and data analysis.

RESEARCH METHODS

Types of Research

The type of research used in this study is a quantitative method using the cluster method. Cluster analysis in this study uses the k-means method.

Data Types

The type of data used in this study is primary data in the form of questionnaires distributed to tourists visiting the Ke'te' Kesu' tourist attraction.

Data Source

The data sources in this study were obtained from respondents through the results of questionnaire data distributed to tourists visiting the Ke'te' Kesu' tourist area.

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Population and Samples

The population in this study includes all tourists who are visiting, but the exact number is unknown. The sample in this study consists of tourists who are visiting the Ke'te' Kesu' tourist area within a certain period of time, although the exact number is unknown. The sample collection technique was carried out using the accidental sampling method.

Operational definition and measurement of variables

The operational definition of research variables is an explanation of each variable used in the research against the indicators that form it. The operational variables that are measured are described into several indicators.

Table 1. Operational Definitions and Indicators

No	Variable	Operational Definitions	Indicators
1	Tourism Object Development	Tourism object development is the process of growth and development of tourist destinations that involves the management of various aspects, such as transportation, accommodation, infrastructure, tourist objects and attractions, visitor services, and other elements that are closely related to community life.	a. City or region of origin b. Age c. Gender d. Level of education e. Employment status f. Income. g. Average tourist expenditure during a visit. h. Transportation. i. Accommodation. j. Infrastructure. k. Environmental facilities. l. Services to visitors. m. Decision to visit.

Data Collection Technique

The data collection technique used in this study is by using a questionnaire. In this study, data was collected by giving questionnaires to respondents, which contained simple questions or statements about variables related to tourist groups, to understand how these variables can affect the development of the Ke'te' Kesu' tourist attraction. Respondents then filled out a questionnaire prepared by the researcher, and their responses became the basis for further analysis.

Data Analysis Techniques

The Data Analysis Technique in this study uses the Orange application with the K-Means method as its grouping. For the data analysis process, this uses the Knowledge Discovery In Database (KDD) process which can be explained in general as follows (Asroni et al., 2018).

1.Data Selection

Before starting the information mining stage in KDD, it is necessary to carry out

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the data selection process from the operational data set. The selected data is then stored in a separate file from the operational database to be used in the data mining process.

2.Pre-Processing/Cleaning

Before carrying out the data mining process, a data cleaning stage is required in KDD. This stage includes removing duplicate data, checking for inconsistencies, and correcting errors, including typographical errors. In addition, an enrichment process is also carried out, namely enriching existing data with additional relevant and necessary information, such as external data.

3. Transformation

Coding is the process of changing selected data to make it suitable for data mining analysis. In KDD, coding is creative and is heavily influenced by the type or pattern of information you want to find in the database.

4. Data Mining

Data mining is the process of finding patterns or important information in selected data by applying certain techniques or methods. Various techniques, methods, and algorithms can be used in data mining, where the right choice depends on the purpose and the overall KDD process.

5. Interpretation/Evaluation

The information pattern results from the data mining process must be presented in a format that is easily understood by the relevant parties. This stage is part of the KDD process known as interpretation.

RESULTS AND DISCUSSION

In this research, there are several stages carried out in managing data, the following stages are as follows:

Testing Process

1. Data Selection

At the Data Selection stage in this study, the process carried out is to change raw data into a format that is easier to understand and process. The first step includes the data input process, which is accompanied by ensuring the completeness of the data. Furthermore, the data is arranged in such a way as to facilitate further processing using Microsoft Excel. The main goal is to make the data more structured, clean, and ready for analysis.

Table 2
Results of selection and preprocessing

Visitors	City of Origin	Employment Status	Monthly Income Range
P01	Bandung	private employees	high
P02	Toraja	Others	high
P03	Stirrup	Others	low
P04	Makassar	Others	low
P05	Toraja	students	average
P06	Purwokerto	private employees	very high

P07	Makassar	private employees	very high
P08	Yogyakarta	private employees	high
P09	Enrekang	students	very low
P10	Enrekang	Others	very low
P11	Makassar	government employees	very high
P12	Makassar	government employees	high
P13	Palopo	Self-employed/entrepreneur	average
P14	Makassar	government employees	average
P15	Stirrup	private employees	average
P16	Palopo	government employees	high
P17	Bitter melon	government employees	high
P18	Palopo	Self-employed/entrepreneur	high
P19	Palopo	private employees	very high
P20	Bali	students	very low
P21	Palopo	government employees	high
P22	Palopo	students	average
P23	Pangkep	government employees	high
P24	Mamuju	Others	low
P25	Palopo	government employees	very high
P26	Surabaya	Others	high
P27	Wondama Bay	government employees	high
P28	Toraja	government employees	very low
P29	Toraja	private employees	high
P30	Wajo	private employees	very low
P31	Toraja	private employees	average
P32	Luwu	private employees	very high
P33	Masamba	government employees	high
P34	Makassar	government employees	average
P35	Bandung	Others	low
P36	Makassar	students	low
P37	Makassar	students	very low
P38	Toraja	Self-employed/entrepreneur	low
P39	Toraja	students	very low
P40	Enrekang	students	very low
P41	Balikpapan	Self-employed/entrepreneur	very high
P42	Jakarta	Self-employed/entrepreneur	average
P43	Luwu	government employees	high
P44	Palopo	government employees	high
P45	Makassar	private employees	low
P46	Toraja	Others	very low
P47	Makassar	Others	low
P48	Hammer	Self-employed/entrepreneur	average
P49	Timika	private employees	high
P50	Toraja	Self-employed/entrepreneur	low

2. Preprocessing

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At the data transformation stage, the data normalization process is carried out using the Orange application, as shown in Figure 2 This step is part of the data preparation for clustering analysis using the K-Means method.

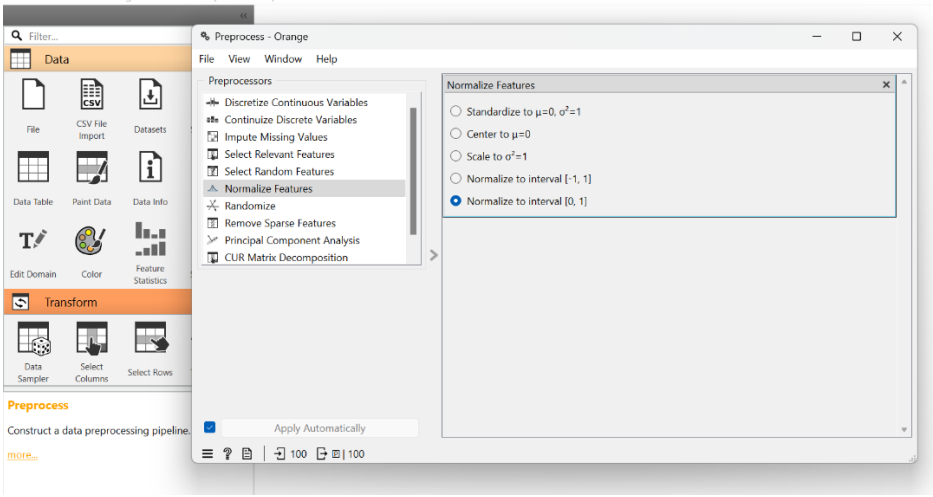
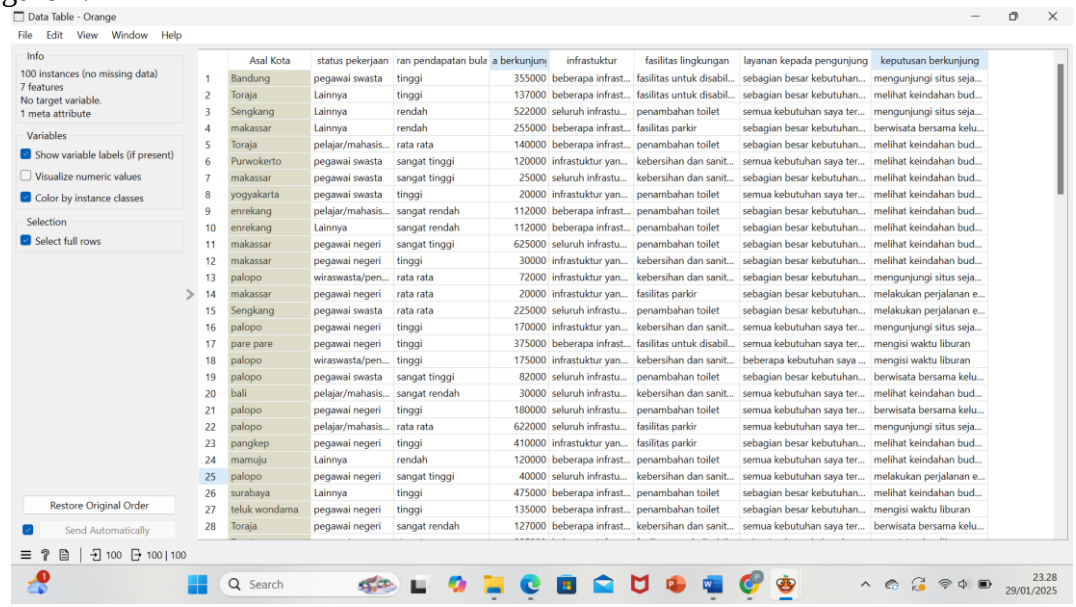


Figure 1 Data Preprocessing

3. Data Transformation

At this stage, data transformation on attributes is not carried out because the available data can be processed directly and continued to the next process, as shown in Figure 2.



	Asal Kota	status pekerjaan	ran pendapatan bula	a berkunjun	infrastuktur	fasilitas lingkungan	layanan kepada pengunjung	keputusan berkunjung
1	Bandung	pegawai swasta	tinggi	355000	beberapa infrast...	fasilitas untuk disabil...	sebagian besar kebutuhan...	mengunjungi situs seja...
2	Toraja	Lainnya	tinggi	137000	beberapa infrast...	fasilitas untuk disabil...	sebagian besar kebutuhan...	melihat keindahan bud...
3	Sengkang	Lainnya	rendah	522000	seluruh infrastu...	penambahan toilet	semua kebutuhan saya ter...	mengunjungi situs seja...
4	makassar	Lainnya	rendah	255000	beberapa infrast...	fasilitas parkir	sebagian besar kebutuhan...	berwisata bersama kelu...
5	Toraja	pelajar/mahasis...	rata rata	140000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
6	Purwokerto	pegawai swasta	sangat tinggi	120000	infrastuktur yan...	kebersihan dan sanit...	semua kebutuhan saya ter...	melihat keindahan bud...
7	makassar	pegawai swasta	sangat tinggi	25000	seluruh infrastu...	kebersihan dan sanit...	sebagian besar kebutuhan...	melihat keindahan bud...
8	yogyakarta	pegawai swasta	tinggi	20000	infrastuktur yan...	penambahan toilet	semua kebutuhan saya ter...	melihat keindahan bud...
9	enrekang	pelajar/mahasis...	sangat rendah	112000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
10	enrekang	Lainnya	sangat rendah	112000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
11	makassar	pegawai negeri	sangat tinggi	625000	seluruh infrastu...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
12	makassar	pegawai negeri	tinggi	30000	infrastuktur yan...	kebersihan dan sanit...	sebagian besar kebutuhan...	melihat keindahan bud...
13	palopo	wiraswasta/pen...	rata rata	72000	infrastuktur yan...	kebersihan dan sanit...	sebagian besar kebutuhan...	mengunjungi situs seja...
14	makassar	pegawai negeri	rata rata	20000	infrastuktur yan...	fasilitas parkir	sebagian besar kebutuhan...	melakukan perjalanan e...
15	Sengkang	pegawai swasta	rata rata	225000	seluruh infrastu...	penambahan toilet	sebagian besar kebutuhan...	melakukan perjalanan e...
16	palopo	pegawai negeri	tinggi	170000	infrastuktur yan...	kebersihan dan sanit...	semua kebutuhan saya ter...	mengunjungi situs seja...
17	pare pare	pegawai negeri	tinggi	375000	beberapa infrast...	fasilitas untuk disabil...	semua kebutuhan saya ter...	mengisi waktu liburan
18	palopo	wiraswasta/pen...	tinggi	175000	infrastuktur yan...	kebersihan dan sanit...	beberapa kebutuhan saya ...	mengisi waktu liburan
19	palopo	pegawai swasta	sangat tinggi	82000	seluruh infrastu...	penambahan toilet	sebagian besar kebutuhan...	berwisata bersama kelu...
20	bali	pelajar/mahasis...	sangat rendah	30000	seluruh infrastu...	kebersihan dan sanit...	semua kebutuhan saya ter...	melihat keindahan bud...
21	palopo	pegawai negeri	tinggi	180000	seluruh infrastu...	penambahan toilet	semua kebutuhan saya ter...	berwisata bersama kelu...
22	palopo	pelajar/mahasis...	rata rata	622000	seluruh infrastu...	fasilitas parkir	semua kebutuhan saya ter...	mengunjungi situs seja...
23	pangkep	pegawai negeri	tinggi	410000	infrastuktur yan...	fasilitas parkir	sebagian besar kebutuhan...	melihat keindahan bud...
24	mamuju	Lainnya	rendah	120000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
25	palopo	pegawai negeri	sangat tinggi	40000	seluruh infrastu...	kebersihan dan sanit...	semua kebutuhan saya ter...	melakukan perjalanan e...
26	surabaya	Lainnya	tinggi	475000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	melihat keindahan bud...
27	teluk wondama	pegawai negeri	tinggi	135000	beberapa infrast...	penambahan toilet	sebagian besar kebutuhan...	mengisi waktu liburan
28	Toraja	pegawai negeri	sangat rendah	127000	beberapa infrast...	kebersihan dan sanit...	semua kebutuhan saya ter...	berwisata bersama kelu...

Figure 2 Data Transformation

4. Implementation of K-Means Algorithm

After the data is processed, the next step is to perform a K-Means Clustering analysis using the Orange Data Mining application. This process aims to group data based

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on tourist characteristics and preferences indicators to determine clusters with low, medium, high, to very high levels. The steps are as follows.

a. Select the File Widget on the Data tab in Orange

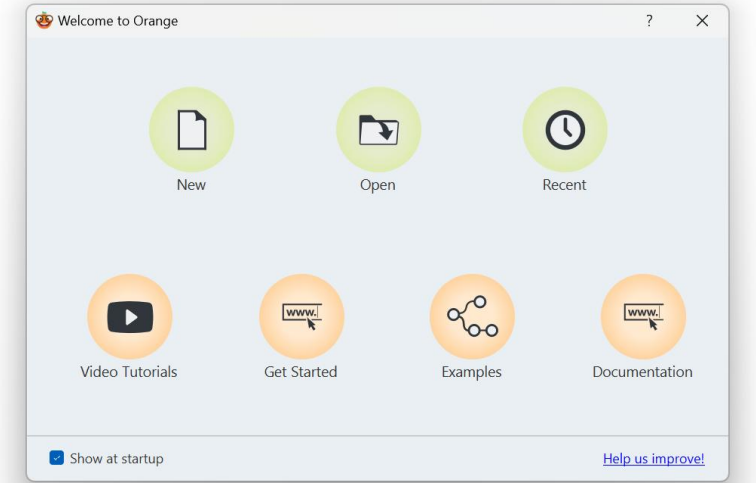

Figure 3 Widget File View on Orange

b. Click on the File Widget to select the data file to be processed.

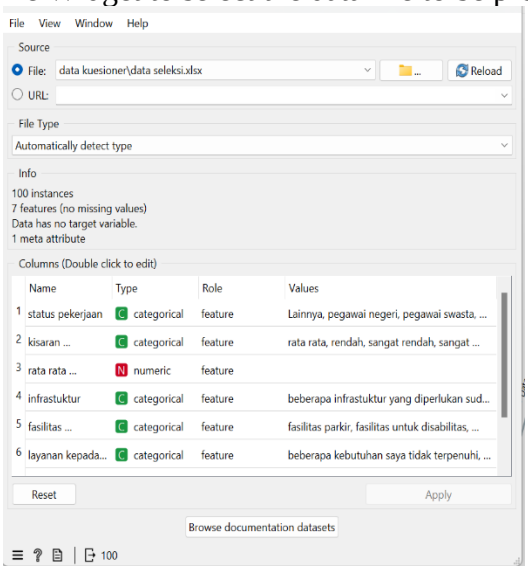

Figure 4 Data Input on Orange

c. For the clustering process, connect the File Widget, then to the table data to see the data to be processed, then to preprocess after that connect it to the K-Means Widget.

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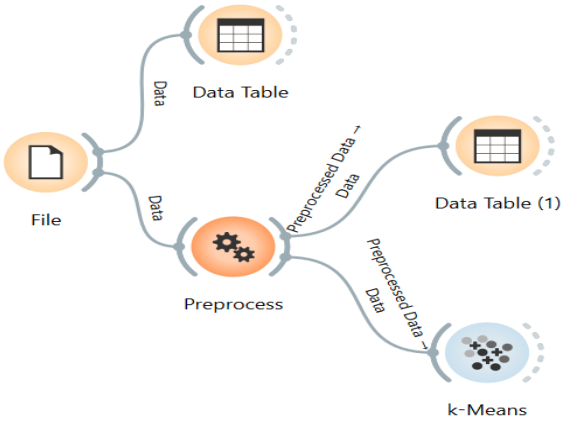

Figure 5 Widget File, Data Table, Preprocess, and K-Means Widget

d. Then determine the number of clusters that have been automatically created by the application. After the K-Means feature is set, the ideal number of clusters is 2 clusters with the highest silhouette score of 0.152.

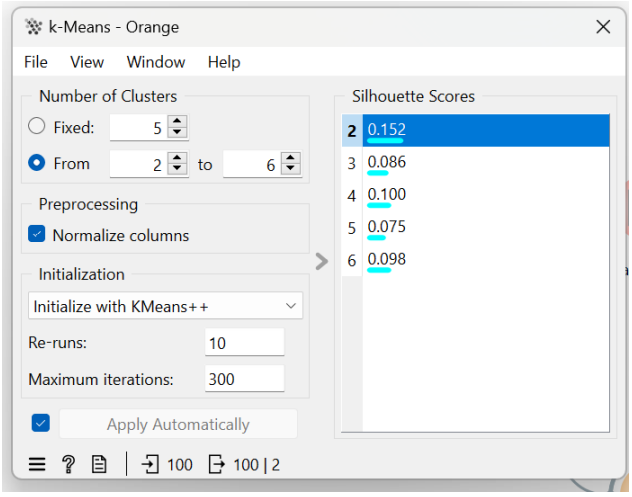

Figure 6 Cluster Determination Process

e. Then the application is carried out on the data that has been obtained using the orange application, as shown in the following image:

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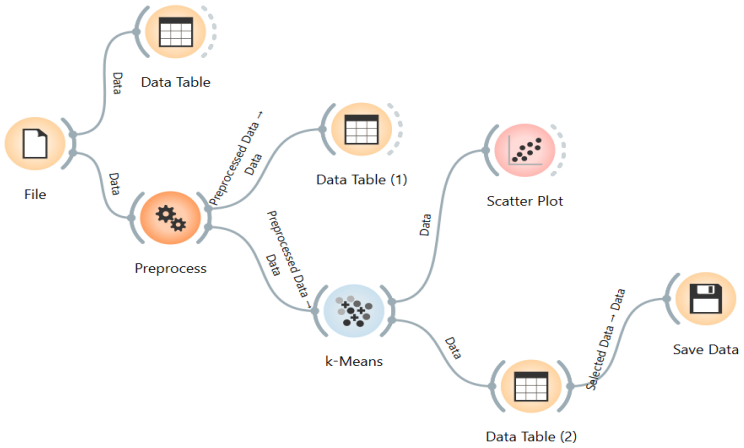

Figure 7 Implementation Structure of K-Means Algorithm on Orange

f. Click the Scatter Plot Widget, then click Find Informative Projections to see the best visualization results.

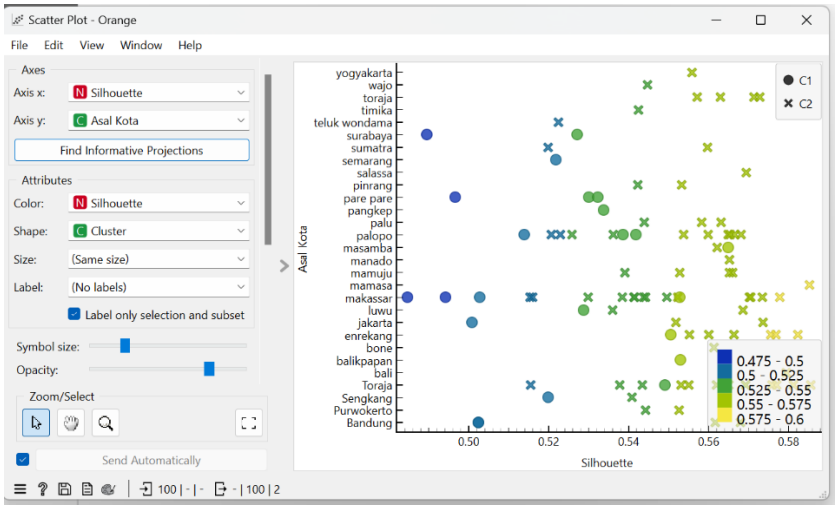

Figure 8 Scatter Plot Widget

5. Researchers conducted an evaluation using the Silhouette Score method to determine whether the number of clusters that had been determined was the most optimal. The higher the value of the Silhouette Score, the better the cluster results. The author determined the number of clusters between 2 and 6 clusters and the result was that the cluster with a number of 2 had a score of 0.152 which was the highest score compared to the number of other clusters. From the cluster evaluation, it can be concluded that clustering with K of 2 is the most optimal. The results of the Silhouette Score evaluation can be seen in the image below:

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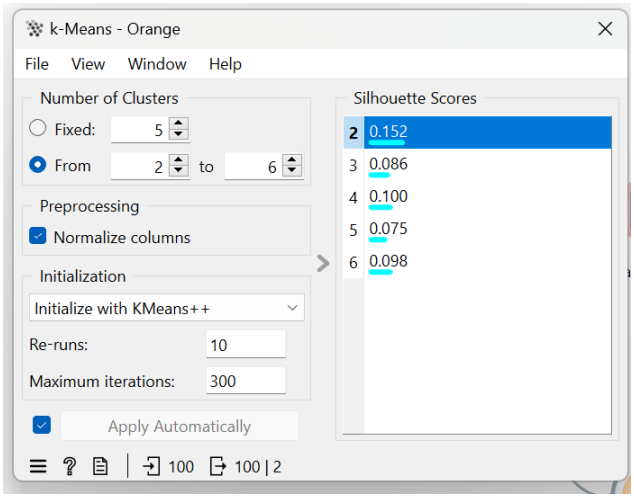

Figure 9 Process of Determining the Best Number of Clusters

Research Result

Based on the data analysis process that has been carried out, the most ideal number of clusters for tourist data visiting the Ke'te' Kesu' tourist attraction from January 17-January 19, 2025 consists of two, with the following details: 1. First Cluster (C1).

Table 3
First Cluster Results

	Asal Kota	Cluster	Silhouette	status pekerjaan	ın pendapatan bu	ama berkunjung d	infrastuktur	asilitas lingkungar	an kepada pengu	putusan berkunju
1	Bandung	C1	0.50243	pegawai swasta	tinggi	0.202417	beberapa infras...	fasilitas untuk d...	sebagian besar ...	mengunjungi si...
3	Sengkang	C1	0.519857	Lainnya	rendah	0.303323	seluruh infrastu...	penambahan to...	semua kebutuh...	mengunjungi si...
11	makassar	C1	0.552773	pegawai negeri	sangat tinggi	0.365559	seluruh infrastu...	penambahan to...	sebagian besar ...	melihat keinda...
17	pare pare	C1	0.53234	pegawai negeri	tinggi	0.214502	beberapa infras...	fasilitas untuk d...	semua kebutuh...	mengisi waktu l...
22	palopo	C1	0.538625	pelajar/mahasis...	rata rata	0.363746	seluruh infrastu...	fasilitas parkir	semua kebutuh...	mengunjungi si...
23	pangkep	C1	0.533759	pegawai negeri	tinggi	0.23565	infrastuktur yan...	fasilitas parkir	sebagian besar ...	melihat keinda...
26	surabaya	C1	0.527087	Lainnya	tinggi	0.274924	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
31	Toraja	C1	0.549128	pegawai swasta	rata rata	0.425982	infrastuktur yan...	penambahan to...	semua kebutuh...	melihat keinda...
33	masamba	C1	0.564968	pegawai negeri	tinggi	0.335347	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
41	balikpapan	C1	0.552987	wiraswasta/pen...	sangat tinggi	1	beberapa infras...	penambahan to...	sebagian besar ...	berwisata bersa...
42	jakarta	C1	0.50072	wiraswasta/pen...	rata rata	0.214502	seluruh infrastu...	fasilitas parkir	semua kebutuh...	mengunjungi si...
43	luwu	C1	0.528803	pegawai negeri	tinggi	0.244713	seluruh infrastu...	fasilitas untuk d...	semua kebutuh...	berwisata bersa...
44	palopo	C1	0.513882	pegawai negeri	tinggi	0.214502	infrastuktur yan...	kebersihan dan ...	sebagian besar ...	melihat keinda...
55	pare pare	C1	0.530042	pegawai swasta	tinggi	0.335347	infrastuktur yan...	kebersihan dan ...	beberapa kebut...	mengisi waktu l...
58	enrekang	C1	0.550486	pegawai negeri	tinggi	0.311178	beberapa infras...	kebersihan dan ...	sebagian besar ...	melihat keinda...
68	pare pare	C1	0.496624	pegawai negeri	tinggi	0.141994	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
71	palopo	C1	0.54182	pegawai negeri	tinggi	0.2429	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
74	makassar	C1	0.502802	pegawai negeri	rata rata	0.181269	beberapa infras...	fasilitas parkir	sebagian besar ...	mengunjungi si...
75	makassar	C1	0.494182	wiraswasta/pen...	rendah	0.21148	seluruh infrastu...	fasilitas untuk d...	semua kebutuh...	melihat keinda...
82	Bandung	C1	0.502341	pegawai negeri	rata rata	0.196375	beberapa infras...	fasilitas parkir	beberapa kebut...	berwisata bersa...
88	semarang	C1	0.521721	pegawai negeri	sangat tinggi	0.214502	beberapa infras...	fasilitas untuk d...	sebagian besar ...	mengisi waktu l...
99	surabaya	C1	0.489545	pegawai negeri	sangat tinggi	0.141994	beberapa infras...	fasilitas untuk d...	sebagian besar ...	melihat keinda...
100	makassar	C1	0.484624	pelajar/mahasis...	sangat rendah	0.247734	beberapa infras...	kebersihan dan ...	semua kebutuh...	melihat keinda...

The First Cluster, consisting of 23% of respondents or 23 people, is a group of high-income tourists with large expenditures when visiting Ke'te' Kesu'. The majority

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come from cities such as Bandung, Makassar, Palopo, Pare-Pare, and Toraja, with jobs as civil servants, private employees, and entrepreneurs. Their incomes vary, but the majority are in the high category, with quite large average expenditures. Respondents considered that most of the infrastructure was available, although there were still deficiencies, especially in parking facilities, sanitation, and toilets. Visitor services were considered to be sufficient to meet needs, but there were several aspects that needed to be improved. The main motivation for their visit was to enjoy local culture, visit historical sites, and fill their vacation time. This provides an opportunity for tourism managers to improve facilities and services to attract more tourists from this segment.

Table 4
Second Cluster Results

2	Toraja	C2	0.537776	Lainnya	tinggi	0.0706949	beberapa infras...	fasilitas untuk d...	sebagian besar ...	melihat keinda...
4	makassar	C2	0.529886	Lainnya	rendah	0.141994	beberapa infras...	fasilitas parkir	sebagian besar ...	berwisata bersa...
5	Toraja	C2	0.562001	pelajar/mahasis...	rata rata	0.0725076	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
6	Purwokerto	C2	0.552577	pegawai swasta	sangat tinggi	0.060423	infrastuktur yan...	kebersihan dan ...	semua kebutuh...	melihat keinda...
7	makassar	C2	0.573522	pegawai swasta	sangat tinggi	0.00302115	seluruh infrastu...	kebersihan dan ...	sebagian besar ...	melihat keinda...
8	yogyakarta	C2	0.555782	pegawai swasta	tinggi	0	infrastuktur yan...	penambahan to...	semua kebutuh...	melihat keinda...
9	enrekang	C2	0.575576	pelajar/mahasis...	sangat rendah	0.0555891	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
10	enrekang	C2	0.566363	Lainnya	sangat rendah	0.0555891	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
12	makassar	C2	0.552258	pegawai negeri	tinggi	0.0060423	infrastuktur yan...	kebersihan dan ...	sebagian besar ...	melihat keinda...
13	palopo	C2	0.565429	wiraswasta/pen...	rata rata	0.0314199	infrastuktur yan...	kebersihan dan ...	sebagian besar ...	mengunjungi si...
14	makassar	C2	0.549476	pegawai negeri	rata rata	0	infrastuktur yan...	fasilitas parkir	sebagian besar ...	melakukan perj...
15	Sengkang	C2	0.540864	pegawai swasta	rata rata	0.123867	seluruh infrastu...	penambahan to...	sebagian besar ...	melakukan perj...
16	palopo	C2	0.522896	pegawai negeri	tinggi	0.0906344	infrastuktur yan...	kebersihan dan ...	semua kebutuh...	mengunjungi si...
18	palopo	C2	0.536186	wiraswasta/pen...	tinggi	0.0936556	infrastuktur yan...	kebersihan dan ...	beberapa kebut...	mengisi waktu l...
19	palopo	C2	0.564861	pegawai swasta	sangat tinggi	0.0374622	seluruh infrastu...	penambahan to...	sebagian besar ...	berwisata bersa...
20	bali	C2	0.579362	pelajar/mahasis...	sangat rendah	0.0060423	seluruh infrastu...	kebersihan dan ...	semua kebutuh...	melihat keinda...
21	palopo	C2	0.520609	pegawai negeri	tinggi	0.0966767	seluruh infrastu...	penambahan to...	semua kebutuh...	berwisata bersa...
24	mamuju	C2	0.552712	Lainnya	rendah	0.060423	beberapa infras...	penambahan to...	semua kebutuh...	melihat keinda...
25	palopo	C2	0.553821	pegawai negeri	sangat tinggi	0.0120846	seluruh infrastu...	kebersihan dan ...	semua kebutuh...	melakukan perj...
27	teluk wondama	C2	0.522385	pegawai negeri	tinggi	0.0694864	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
28	Toraja	C2	0.553137	pegawai negeri	sangat rendah	0.0646526	beberapa infras...	kebersihan dan ...	semua kebutuh...	berwisata bersa...
29	Toraja	C2	0.515446	pegawai swasta	tinggi	0.123867	beberapa infras...	fasilitas untuk d...	sebagian besar ...	mengisi waktu l...
30	wajo	C2	0.544786	pegawai swasta	sangat rendah	0.138973	beberapa infras...	kebersihan dan ...	semua kebutuh...	berwisata bersa...

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32	luwu	C2	0.568666	pegawai swasta	sangat tinggi	0.00302115	infrastuktur yan...	kebersihan dan ...	sebagian besar ...	mengunjungi si...
34	makassar	C2	0.541465	pegawai negeri	rata rata	0.0422961	beberapa infras...	fasilitas untuk d...	sebagian besar ...	melihat keinda...
35	Bandung	C2	0.567965	Lainnya	rendah	0.0422961	beberapa infras...	kebersihan dan ...	sebagian besar ...	mengunjungi si...
36	makassar	C2	0.538349	pelajar/mahasis...	rendah	0.0966767	infrastuktur yan...	fasilitas parkir	beberapa kebut...	mengunjungi si...
37	makassar	C2	0.570468	pelajar/mahasis...	sangat rendah	0.060423	infrastuktur yan...	kebersihan dan ...	sebagian besar ...	mengisi waktu l...
38	toraja	C2	0.562959	wiraswasta/pen...	rendah	0.0253776	beberapa infras...	penambahan to...	semua kebutuh...	berwisata bersa...
39	toraja	C2	0.572754	pelajar/mahasis...	sangat rendah	0.0386707	seluruh infrastu...	penambahan to...	sebagian besar ...	mengunjungi si...
40	enrekang	C2	0.576901	pelajar/mahasis...	sangat rendah	0.0253776	infrastuktur yan...	penambahan to...	sebagian besar ...	berwisata bersa...
45	makassar	C2	0.544155	pegawai swasta	rendah	0.10574	seluruh infrastu...	penambahan to...	semua kebutuh...	berwisata bersa...
46	toraja	C2	0.571368	Lainnya	sangat rendah	0.0634441	seluruh infrastu...	kebersihan dan ...	sebagian besar ...	berwisata bersa...
47	makassar	C2	0.515945	Lainnya	rendah	0.154079	beberapa infras...	fasilitas untuk d...	semua kebutuh...	melihat keinda...
48	palu	C2	0.563159	wiraswasta/pen...	rata rata	0.0314199	beberapa infras...	penambahan to...	sebagian besar ...	mengunjungi si...
49	timika	C2	0.542515	pegawai swasta	tinggi	0.0755287	seluruh infrastu...	fasilitas untuk d...	sebagian besar ...	berwisata bersa...
50	toraja	C2	0.55719	wiraswasta/pen...	rendah	0.00302115	seluruh infrastu...	fasilitas untuk d...	semua kebutuh...	melakukan perj...
51	Toraja	C2	0.564202	pelajar/mahasis...	sangat rendah	0.0314199	seluruh infrastu...	fasilitas untuk d...	semua kebutuh...	berwisata bersa...
52	palu	C2	0.558266	pegawai swasta	rata rata	0.060423	beberapa infras...	kebersihan dan ...	semua kebutuh...	melihat keinda...
53	Toraja	C2	0.569277	wiraswasta/pen...	sangat rendah	0.0422961	beberapa infras...	kebersihan dan ...	semua kebutuh...	berwisata bersa...
54	salassa	C2	0.56939	pegawai swasta	rendah	0.00725076	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
56	Toraja	C2	0.555001	pegawai negeri	rata rata	0.0374622	beberapa infras...	kebersihan dan ...	sebagian besar ...	mengunjungi si...
57	makassar	C2	0.577751	pelajar/mahasis...	sangat rendah	0.0163142	seluruh infrastu...	kebersihan dan ...	semua kebutuh...	melihat keinda...
59	makassar	C2	0.541256	pegawai negeri	tinggi	0.0181269	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
60	Toraja	C2	0.575906	pelajar/mahasis...	sangat rendah	0.073716	beberapa infras...	kebersihan dan ...	sebagian besar ...	melihat keinda...
61	mamuju	C2	0.538984	Lainnya	rendah	0.107553	beberapa infras...	fasilitas untuk d...	sebagian besar ...	melihat keinda...
62	mamuju	C2	0.565973	pelajar/mahasis...	rendah	0.0797583	seluruh infrastu...	kebersihan dan ...	sebagian besar ...	melihat keinda...
63	enrekang	C2	0.58226	pelajar/mahasis...	sangat rendah	0.0241692	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
64	palopo	C2	0.568095	pelajar/mahasis...	sangat rendah	0.0283988	infrastuktur yan...	fasilitas untuk d...	sebagian besar ...	melihat keinda...
65	enrekang	C2	0.560068	pelajar/mahasis...	rendah	0.0332326	infrastuktur yan...	penambahan to...	beberapa kebut...	mengisi waktu l...
66	mamasa	C2	0.585297	pelajar/mahasis...	sangat rendah	0.0302115	beberapa infras...	kebersihan dan ...	sebagian besar ...	melihat keinda...
67	enrekang	C2	0.555141	wiraswasta/pen...	rata rata	0.0392749	seluruh infrastu...	penambahan to...	beberapa kebut...	mengisi waktu l...
69	Toraja	C2	0.577005	pelajar/mahasis...	sangat rendah	0.073716	beberapa infras...	kebersihan dan ...	sebagian besar ...	berwisata bersa...
70	bone	C2	0.561339	pelajar/mahasis...	sangat rendah	0.10997	beberapa infras...	kebersihan dan ...	sebagian besar ...	mengisi waktu l...
72	luwu	C2	0.535983	Lainnya	rata rata	0.125076	seluruh infrastu...	kebersihan dan ...	semua kebutuh...	mengunjungi si...
73	Toraja	C2	0.565107	Lainnya	rendah	0.073716	beberapa infras...	kebersihan dan ...	sebagian besar ...	berwisata bersa...
76	pinrang	C2	0.542231	pegawai swasta	rata rata	0.0616314	beberapa infras...	fasilitas untuk d...	semua kebutuh...	mengisi waktu l...
77	jakarta	C2	0.551805	pegawai swasta	sangat tinggi	0.0906344	seluruh infrastu...	penambahan to...	sebagian besar ...	berwisata bersa...
78	jakarta	C2	0.57363	pelajar/mahasis...	sangat rendah	0.0646526	beberapa infras...	penambahan to...	sebagian besar ...	berwisata bersa...
79	palopo	C2	0.566512	pelajar/mahasis...	sangat rendah	0.102719	seluruh infrastu...	kebersihan dan ...	sebagian besar ...	melihat keinda...
80	makassar	C2	0.543726	pelajar/mahasis...	sangat rendah	0.181269	seluruh infrastu...	kebersihan dan ...	sebagian besar ...	berwisata bersa...
81	palu	C2	0.543848	pelajar/mahasis...	rendah	0.123867	beberapa infras...	penambahan to...	sebagian besar ...	mengisi waktu l...
83	Bandung	C2	0.561619	Lainnya	rata rata	0.0332326	beberapa infras...	kebersihan dan ...	semua kebutuh...	mengunjungi si...
84	sumatra	C2	0.519764	wiraswasta/pen...	tinggi	0.123867	seluruh infrastu...	fasilitas parkir	sebagian besar ...	melihat keinda...
85	sumatra	C2	0.559701	wiraswasta/pen...	rata rata	0.0785498	beberapa infras...	kebersihan dan ...	sebagian besar ...	melihat keinda...
86	makassar	C2	0.570215	pelajar/mahasis...	rendah	0.0543807	beberapa infras...	kebersihan dan ...	sebagian besar ...	mengisi waktu l...
87	mamuju	C2	0.565207	pegawai swasta	rata rata	0.021148	seluruh infrastu...	kebersihan dan ...	beberapa kebut...	mengisi waktu l...
89	pinrang	C2	0.55328	pegawai swasta	rata rata	0.0634441	seluruh infrastu...	penambahan to...	beberapa kebut...	melihat keinda...
90	palopo	C2	0.559962	wiraswasta/pen...	rata rata	0.0483384	beberapa infras...	kebersihan dan ...	beberapa kebut...	melakukan perj...
91	makassar	C2	0.515367	Lainnya	sangat tinggi	0.18429	beberapa infras...	kebersihan dan ...	beberapa kebut...	mengunjungi si...
92	masamba	C2	0.562163	wiraswasta/pen...	rata rata	0.0453172	seluruh infrastu...	penambahan to...	sebagian besar ...	melihat keinda...
93	Purwokerto	C2	0.544221	wiraswasta/pen...	rata rata	0.108761	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
94	manado	C2	0.565158	wiraswasta/pen...	tinggi	0.00302115	beberapa infras...	penambahan to...	sebagian besar ...	berwisata bersa...
95	Toraja	C2	0.585541	pelajar/mahasis...	sangat rendah	0.00302115	beberapa infras...	penambahan to...	sebagian besar ...	melihat keinda...
96	Toraja	C2	0.581268	pelajar/mahasis...	sangat rendah	0.0314199	beberapa infras...	kebersihan dan ...	sebagian besar ...	mengunjungi si...
97	Toraja	C2	0.543343	pelajar/mahasis...	sangat rendah	0.146224	beberapa infras...	penambahan to...	sebagian besar ...	mengunjungi si...
98	palopo	C2	0.525763	pegawai swasta	tinggi	0.138973	seluruh infrastu...	kebersihan dan ...	beberapa kebut...	mengisi waktu l...

Cluster C2, which includes 77% of respondents or 77 people, consists of tourists with low to very low incomes, mostly from Makassar, Toraja, Palopo, Enrekang, and Yogyakarta, and are students, private employees, and self-employed. Their average

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expenditure is low, with the main purpose of visiting to enjoy local culture, traveling with family or friends, and educational trips. The infrastructure is considered quite adequate, although there are still deficiencies in parking, sanitation, and toilet facilities. Visitor services are mostly considered to meet needs, but still need improvement. This cluster shows the need to improve facilities and services so that the tourism experience is more optimal for this segment.

Discussion

Based on the analysis results conducted on Cluster C1, which covers 23% of the total visitors to Ke'te' Kesu', dominated by tourists from big cities such as Makassar, Pare-pare, Palopo, Surabaya, and Bandung. Most of them are civil servants, private employees, and entrepreneurs, with the majority having high to very high incomes. An interesting recommendation for managers is to develop exclusive tour packages that include premium services such as private tours, interactive cultural experiences, and VIP rest areas. In addition, infrastructure improvements need to be made, especially in toilet facilities, parking, and sanitation, to meet the expectations of high-income tourists. Provision of adequate public facilities is also a priority. Digital-based marketing strategies through social media and travel platforms must be further optimized by highlighting the cultural and historical aspects that are the main attractions for this cluster. In addition, the sale of souvenirs and gifts typical of Toraja, such as Toraja clothing, woven fabrics, and Toraja coffee, has the potential to be a very promising business, considering that tourists in this cluster tend to have high purchasing power and are interested in bringing home souvenirs as keepsakes.

The results of the analysis conducted on Cluster C2, which covers 77% of the total tourists, are dominated by students, college students, as well as private employees and self-employed people who mostly have low to very low incomes. Tourists in this cluster come from various cities in Sulawesi such as Toraja, Makassar, Palopo, and Enrekang, as well as some from outside Sulawesi such as Yogyakarta and Jakarta. To meet this need, the recommendation that can be given is to develop educational tourism packages, such as historical tours and cultural workshops. In addition, improving cleanliness and sanitation needs special attention to increase tourist satisfaction. A more inclusive marketing strategy can be carried out through collaboration with schools, universities, and tourism communities to attract more tourists from this segment. One step that can be taken is to provide interactive learning areas in tourist areas, such as educational spots with digital information boards or audio guides that explain the history and culture of Ke'te' Kesu' in an interesting way. This will provide an educational tourism experience without having to burden visitors with high additional costs.

CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis results, the majority of tourists visiting the Ke'te' Kesu' tourist attraction come from school and college students.

a. The development of this tourist destination can be focused on a concept that is interesting for the group. One effort that can be implemented is the development of educational tour packages by providing interactive experiences, such as historical

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tours, cultural workshops, and the provision of interactive learning areas with digital information boards or audio guides that explain the history and culture of Toraja in an interesting way.

b. To support the local economy and increase revenue from the culinary sector, managers can implement policies that limit visitors from bringing food and drinks from outside.

c. Improving public facilities, such as adding toilets, comfortable rest areas, and better access routes, needs to be a priority so that tourists from various groups, especially, feel more comfortable during their visits.

d. In terms of promotion, managers can collaborate with educational institutions, such as schools and universities, as well as tourism communities to promote the Ke'te' Kesu' tourist attraction as an educational tourism destination. This collaboration can include study-based tourism programs, organizing academic activities at tourist locations, or integrating this destination into the curriculum of cultural and historical education.

First Cluster (C1) Covers around 23% of the total respondents who visited the Ke'te' Kesu' tourist attraction. Visitors in this cluster are dominated by tourists from big cities such as Makassar 17%, Pare-pare and Palopo 13%, Surabaya and Bandung 9%, Semarang, Enrekang, Luwu, Jakarta, Balikpapan, Masamba, Toraja as much as 4%. In terms of employment status, this group mostly consists of civil servants 57%, private employees and self-employed/entrepreneurs 13%, while students/university students and others only cover 9% of the total first cluster. Related to monthly income, most respondents in this cluster have a high income of 48%, Average 22%, very high 17%, while those with low incomes are 9% and very low 4%. Regarding satisfaction with infrastructure, 57% of respondents stated that some of the necessary infrastructure in the Ke'te' Kesu' tourist attraction is available but still needs improvement, while 26% considered that all the necessary infrastructure is available, and 17% felt that the available infrastructure was not sufficient for tourists' needs. In terms of satisfaction with environmental facilities, 35% of respondents highlighted the need for additional toilets, 26% stated the need for facilities for the disabled, 22% wanted improved parking facilities and 17% of respondents highlighted Cleanliness and sanitation. Meanwhile, regarding visitor services, 57% of respondents felt that most of their needs were met during their visit to the Ke'te' Kesu' tourist attraction, 35% stated that All their needs were met well during their visit to the Ke'te' Kesu' tourist attraction, and 9% stated that some of their needs were not met. The decision to go to Ke'te' Kesu' in this cluster also varies, with 39% of respondents coming to see the beauty of local culture and traditions, 26% of respondents visiting just to fill their vacation time, 22% coming to the Ke'te' Kesu' tourist attraction to visit historical sites or cultural heritage, 13% Traveling with family/friends.

Cluster Two (C2) Covers around 77% of the total respondents who visited the Ke'te' Kesu' tourist attraction. The majority of visitors in this cluster come from various cities in Sulawesi, such as Toraja 22%, Makassar 18%, Palopo 13%, Enrekang 8%, Mamuju 5%, Palu 4%, then from Purwokerto, Luwu, Bandung, Pinrang, Jakarta, and Sumatra as much as 3%, there are also from Yogyakarta, Sengkang, Bali, Teluk

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Wondama, Wajo, Timika, Salassa, Mamasa, Bone, Masamba, and Manado only 1%. Based on employment status, this cluster is dominated by students/university students as much as 32%, followed by private employees 22%, self-employed/entrepreneurs 17%, and those who choose other employment status 16%, then civil servants 13%. In terms of monthly income, 31% of respondents have very low income, 23% have Average income, 19% have low income, while 17% have high income, and 9% have very high income. Evaluation of infrastructure shows that 52% of respondents feel that some of the infrastructure needed by tourists is available, 31% consider that all the infrastructure needed by tourists is available, and 17% stated that the available infrastructure is not sufficient for tourists' needs and still needs improvement. Regarding environmental facilities, 45% of respondents consider that cleanliness and sanitation still need to be improved, while 36% stated that additional toilets are still needed, and another 13% highlighted the need for facilities for people with disabilities, as well as an increase in parking area capacity by 5%.

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