# DECISION SUPPORT SYSTEM FOR SELECTING TOURIST ATTRACTIONS OF TRADITIONAL HOUSE AND CULTURE IN SOUTHWEST SUMBA REGENCY USING TOPSIS

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### ABSTRACT

Southwest Sumba Regency (SBD) in East Nusa Tenggara has unique cultural tourism potential, including the traditional houses of the Sumba tribe, which are still preserved. These houses reflect the cultural and spiritual values of the local community through their architecture and traditional building materials such as bamboo, wood, and thatch. In addition to traditional houses, Sumba's culture is rich in traditional rituals, ikat weaving arts, and megalithic tombstones. However, the lack of information regarding the locations of these tourist attractions poses a challenge for tourists who wish to explore SBD. Many tourists struggle to find lesser-known tourist spots due to the limited real-time information and promotional media. Therefore, a decision support system (DSS) based on the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method is proposed to assist tourists in selecting travel destinations in SBD. TOPSIS is considered effective because it ranks alternatives based on the shortest distance from the ideal positive solution and the longest distance from the ideal negative solution. This system allows tourists to receive recommendations for travel destinations by considering various criteria, such as distance, cost, facilities, and transportation. This research demonstrates that the TOPSIS method successfully provides the best recommendations from 14 tourist locations in SBD, with the Pasola Festival and Watu Malandong being the top choices with a score of 0.6958, followed by the Sumba Cultural House with a score of 0.6561. The DSS based on TOPSIS helps accelerate the process of searching for and selecting travel destinations according to tourists' needs, facilitates the promotion of lesser-known tourist spots, and supports the local government in promoting tourism in SBD. Thus, this system is expected to provide a practical solution for tourists in discovering tourist attractions in SBD.

Keywords Topsis; Tourist; Decision Support System; Paper type Research paper

# INTRODUCTION

Southwest Sumba Regency, commonly referred to as SBD, is one of the administrative regions with its capital named Tambolaka. This regency is located on Sumba Island and is part of the East Nusa Tenggara Province. Southwest Sumba has a variety of tourist attractions that have preserved their authenticity, offering a unique experience for visitors to these places [1].

Most of the area in Southwest Sumba Regency holds great potential for tourism promotion, thanks to the uniqueness of its natural and cultural elements. One of the most attractive tourist potentials is the unique Sumba tribal houses and the rich Sumbanese culture, which is still deeply rooted in ancestral traditions [2].

The traditional Sumba house is one of the cultural heritages still preserved in Sumba. The traditional houses of the Sumba tribe have several unique features that reflect the cultural heritage and way of life of its people. Sumba tribal houses generally have distinctive architecture, with roofs that curve upwards and are often adorned with traditional carvings. The walls are usually made of bamboo or wood, crafted with artistic detail. The Sumba tribe has a main sleeping area called 'Uma Mbatangu [3].

This room is considered sacred and is usually occupied by the head of the family. The interior design of the Uma Mbatangu also reflects religious values and daily life. The arrangement of Sumba tribal houses often mirrors the social structure and kinship system of the community. Some houses are built close together to form villages, and the location and size of the house may reflect the family's

social status. Traditional Sumba houses use traditional building materials such as bamboo, wood, and thatch, which are often used in the construction of the house. Traditional household items such as weaving tools and handcrafted items are often found inside the house [4].

Sumba tribal houses are often equipped with a family shrine or altar. Religious ceremonies and traditional beliefs are frequently practiced either inside the house or in the surrounding yard. These unique features make traditional Sumba houses not only a place to live but also a rich representation of the cultural and spiritual values of the community. In terms of cultural tourism, Sumba is rich in cultural heritage, including traditional rituals and ceremonies practiced by followers of Marapu. There is also the tradition of ikat weaving, megalithic-era stone graves, as well as carving and sculpting arts [5].

Currently, traditional house and cultural tourism attractions in Southwest Sumba Regency have been increasingly introduced to tourists through previous visits to several locations. However, for those who have never visited or are coming to the regency for the first time, finding information related to the position and location of each traditional house and cultural attraction can be challenging. Some people may struggle to determine the exact directions and locations [6].

Sometimes, tourists have to rely on asking local residents for directions to these tourist attractions. The search process is not limited to one location but must be repeated in each area visited, as tourists need to find their way from one place to another. This process can consume a lot of time and energy, and tourists may sometimes even get lost [7].

The use of internet media and various promotional tools, such as brochures, still faces challenges in providing information that meets tourists' needs, especially in terms of quickly and easily finding traditional house and cultural tourist locations in real-time. Most tourists today access tourism information through their smartphones, often conducting searches without knowing the clear source of the information or the availability of specific apps for finding tourist locations and other details. This issue also presents a challenge for the local government in its efforts to promote tourism attractions in Southwest Sumba Regency [8].

The lack of information about traditional house and cultural tourist attractions in Southwest Sumba Regency results in tourists visiting only well-known or familiar attractions, which they usually discover through social media or information on the internet. Therefore, to provide information about the tourist attractions in Southwest Sumba Regency and offer recommendations to tourists in choosing destinations, a system is needed that can assist tourists in selecting tourist destinations in Southwest Sumba Regency. One effective way to provide recommendations for tourist attractions to visitors is through a decision support system [9].

This research utilizes the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method for calculations and decision-making support. The system displays recommendations for selecting tourist destinations based on criteria chosen by potential tourists. However, the system does not provide services for purchasing tickets or booking. There are six main criteria used: cleanliness, distance, safety, comfort, cost, and facilities. The alternatives consist of 11 traditional house tourism spots and 3 cultural tourism spots (Pasola, Bau Nyale, Woleka), totaling 14 tourist destinations. The weightings for the selection of tourism destinations are determined based on the results of a questionnaire. The research is limited to the Southwest Sumba Regency. The system design will be developed using the TOPSIS method.

# METHOD

This research uses the Topsis method, which is described as a research approach used to gather facts related to the observed characteristics, allowing conclusions to be drawn from those characteristics. The focus of this study is on the development of a Decision Support System for selecting House and Cultural Tourist Attractions in Southwest Sumba Regency [10].

The experimental method was chosen for specific reasons, as the researcher aims to find recommendations for selecting House and Cultural tourist attractions in Southwest Sumba Regency, considering six key factors: facilities, cost, comfort, security, distance, and cleanliness [11]. Here is the system design implemented in the tourist destination selection system.

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Figure 1. System Design

# **Requirements Analysis**

The information required to ensure that the application functions properly, as desired and needed, includes: Criteria data , Sub-criteria data and Alternative data (tourist objects in Southwest Sumba).

#### Process Design

The process design is demonstrated through the creation of a class diagram, which illustrates the system's activities in storing data based on the data classes that are saved and interconnected. This is because class diagrams are the foundation of almost every object-oriented UML method. The class diagram is static, depicted as a box, and divided into three main components: class name, attributes, and operations. It can be seen in the following figure.



Figure 3. Design Class Diagram for Decision Support System (DSS) for Tourist Attraction Selection

#### Data Analysis

There are two general steps that researchers follow in conducting data analysis, which are as follows: primary data The researcher uses observation, literature review, and questionnaires to obtain data and determine the basis for the problem in selecting the Rumah dan Budaya tourist attraction in Southwest Sumba Regency and secondary data the researcher uses existing data (data sets) to assist as a reference for relevant research data.

### **Process Analysis**

Process Analysis for Selecting the Rumah dan Budaya Tourist Attraction in Southwest Sumba Regency the process analysis is carried out to determine the system that will be developed, the workings of the system, and the creation of a decision support system that can solve the problems faced. In the process analysis, the researcher describes the flowchart used to explain the system's workflow, which can be seen in the following diagram.



Figure 3. Flowchart of the Tourist Attraction Selection Process

Alternative Data for Selecting the Rumah dan Budaya Tourist Attraction in Southwest Sumba Regency The following are alternative data that will be used as part of the evaluation criteria for the tourist attractions. These alternative data are presented in the following table.

TABLE I. TABLE OF SAMPLE ALTERNATIVES FOR CULTURAL AND TRADITIONAL TOURIST ATTRACTIONS IN SOUTHWEST SUMBA

А	lternative Code	Alternative Name
A1		Rumah Budaya Sumba
A2		Kampung Adat Ratenggaro
A3		Kampung Situs Bongu
A4		Kampung Situs Mano Maneka
A5		Kampung Situs Adat Mbuku Bani
A6		Situs Manola
A7		Kampung Situs Toda
A8		Kampung Situs Wainyapu
A9		Kampung Situs Tossi
A10		Museum Budaya Sumba
A11		Festival Adat Pasola dan Pantai Watu Malandong
A12		Museum Mamuli

# DISCUSSION

The implementation of this system is the phase of applying the design that has been created. This

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section will discuss the implementation of the Topsis method as a decision support system for selecting cultural house objects in Southwest Sumba. By using the Topsis method, the existing criteria data for cultural house objects in Southwest Sumba will be processed to recommend the best cultural house objects in the area. The implementation of this system is the phase of applying the design that has been created. This section will discuss the implementation of the Topsis method as a decision support system for selecting cultural house objects in Southwest Sumba. By using the Topsis method, the existing cultural house objects in Southwest Sumba will be processed to recommend the best of the topsis method, the existing cultural house objects in Southwest Sumba will be processed to recommend the best cultural house objects in the area. The Topsis calculation results are presented as follows.

	PERHITUNGAN TOP	PSIS				
Matrix Ternormalisasi	Matrix Normalisasi Terbobot Solusi Ideal positif Negatif	Preferensi				
Preferensi						
			V			
	Rumah Budaya Sumba		0.4847			
	Kampung Adat Ratenggaro		0.5324			
	Kampung Situs Bongu		0.5151			
	Kampung Situs Mano Maneka		0.4903			
	Kampung Situs Adat Mbuku Mbani		0.6104			
	Situs Manola		0.6085			
	Kampung Situs Toda		0.4729			
	Kampung Situs Wainyapu		0.4611			
	Kampung Situs Tosi		0.4475			
	Museum Budaya Sumba		0.6561			
	Festival Adat Pasola & Pantai Watu Malandong		0.6958			
	Museum Mamuli		0.43			

#### Figure 4. TOPSIS Calculation

Based on the results of the TOPSIS calculation, the cultural and house tourism objects in Southwest Sumba indicate that the most recommended tourist attraction is the Pasola Festival and Watu Malandong with a score of 0.6958, followed by the Sumba Cultural House with a score of 0.6561. The TOPSIS method successfully provided rankings with varying scores across 14 locations. The research results indicate that the system developed can respond well according to the input data. Thus, the existence of a selection system for cultural and house tourist objects in Southwest Sumba can facilitate the wider community in searching for lodgings with the best recommendations processed using the TOPSIS method. Among the 14 alternative data for cultural and house tourism objects in Southwest Sumba that have been tested, the best alternative is the Pasola Festival and Watu Malandong, with a score of 0.6958, followed by the Sumba Cultural House with a preference score of 0.6561. The determination of tourist locations using the Topsis method aligns with the research which shows that the Decision Support System (DSS) developed is capable of generating recommendations by ranking tourist locations according to user preferences. This system was tested using 17 alternatives and 3 criteria, consisting of 1 cost criterion and 2 benefit criteria. The experiments successfully provided different rankings for 15 alternatives, while 2 alternatives had the

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same ranking in positions 5 and 6 due to their identical scores across all criteria. The advantage of the TOPSIS method compared to other methods is that each alternative is evaluated not only based on its strengths but also on its weaknesses.

TOP RANGKING OBJEK WISATA TERBAIK Hasil Akhir Analisa Metode Topsis Dengan Nilai bobot preferensi sebagai : W adalah = (5,4,3,3,2,2) Jadi dapat disimpulkan bahwa Alternatif terbaik menggunakan metode topsis adalah Festival Adat Pasola & dengan nilai Metode Topsis 0.6958.					
Show 10 🗸 entries Sec					
Rangking	Hunian Kos	👎 Hasil Nilai Metode Topsis			
1.	Festival Adat Pasola & Pantai Watu Malandong	0.6958			
2.	Museum Budaya Sumba	0.6561			
з.	Kampung Situs Adat Mbuku Mbani	0.6104			
4.	Situs Manola	0.6085			
5.	Kampung Adat Ratenggaro	0.5324			
6.	Kampung Situs Bongu	0.5151			
7.	Kampung Situs Mano Maneka	0.4903			
8.	Kampung Situs Toda	0.4729			
9.	Rumah Budaya Sumba	0.4647			
10.	Kampung Situs Wainyapu	0.4611			

Figure 5. TOPSIS Top Ranking

# CONCLUSION

The TOPSIS method has proven effective in providing recommendations for tourist attractions in Southwest Sumba, with results indicating that the Pasola Festival and Watu Malandong are the top choices. The developed system demonstrates a responsive capability to the input data, making it easier for the community to search for lodgings. This research aligns with previous studies that affirm the reliability of the TOPSIS method in generating rankings that reflect user preferences. By considering both the strengths and weaknesses of each alternative, this method offers a comprehensive approach for improved decision-making in selecting tourist locations.

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