Jurteki-Sis-Samuel-Setiyo-Andri.doc

By Siswanti

WORD COUNT	3636	TIME SUBMITTED	31-MAR-2024 01:28PM
		PAPER ID	107950587

IMPLEMENTATION OF TOPSIS AND SAW METHODS FOR THE SELECTION OF THE BEST HOTEL

Samuel Widi Kristanto[1], Sri Siswanti[2*], Setiyowati [3] , Andriani Kusumaningrum [4]
[1,3]Information System, STMIKSinar Nusantara
[2]Informatics, STMIK Sinar Nusantara
[4]Accounting information system, STMIK Sinar Nusantara
email: syswanty@sinus.ac.id

Abstract: After the decline in the positive rate of COVID-19 in Indonesia, especially Surakarta City, it has become one of the cities that has begun to be enlivened again with local and foreign tourist visits because there are various kinds of interesting cultural tourism to visit. The development of culture and tourist destinations in the city of Solo is balanced with improved services. The obstacle experienced is the lack of time efficiency in choosing the best hotel according to the desired criteria because it is still done manually, so it takes a long time. The number of hotels with many services and facilities makes tourists confused when choosing a hotel, so a system is needed that supports decision-making in determining the desired hotel. This study used 10 hotel data points in Laweyan Surakarta District and hotel data obtained from the Tourism Office. The purpose of this study is the use of TOPSIS and SAW methods to support decision-making on hotel selection recommendations. Hotel selection criteria are based on price, location, facilities, and desired class. McCall Test results with 5 indicators, namely accuracy, reliability, efficiency, integrity, and usability, average 86%, then this system is categorized as very good.

Keywords: Hotel selection, TOPSIS, SAW, Decision Supporter System.

Abstrak: Pasca menurunnya angka positif COVID-19 di Indonesia khususnya Kota Surakarta menjadi salah satu kota yang mulai diramaikan kembali dengan kunjungan wisatawan lokal maupun mancanegara karena terdapat berbagai macam wisata budaya yang menarik untuk dikunjungi. Berkembangnya budaya dan destinasi wisata di kota Solo, diimbangi dengan peningkatan pelayanan. Kendala yang dialami adalah kurangnya efisiensi waktu dalam pemilihan hotel terbaik sesuai kriteria yang diinginkan karena masih dilakukan secara manual sehingga memakan waktu yang lama. Banyaknya hotel dengan pelayanan dan fasilitas yang banyak membuat wisatawan kebingungan dalam memilih hotel, sehingga diperlukan suatu sistem yang mendukung dalam pengambilan keputusan dalam menentukan hotel yang diinginkan. Penelitian ini menggunakan 10 titik data hotel yang ada di Kecamatan Lawey-an Surakarta dan data hotel yang diperoleh dari Dinas Pariwisata. Tujuan dari penelitian ini adalah penggunaan metode TOPSIS dan SAW untuk mendukung pengambilan keputusan rekomendasi pemilihan hotel. Kriteria pemilihan hotel didasarkan pada harga, lokasi, fasilitas, dan kelas yang diinginkan. Hasil Uji McCall dengan 5 indikator yaitu akurasi, reliabilitas, efisiensi, integritas, dan kegunaan rata-rata 86%, maka sistem ini dikategorikan sangat baik.

Kata kunci: Pemilihan hotel, TOPSIS, SAW, Sistem Penunjang Keputusan

INTRODUCTION

The rapid development of information technology has a great impact on various aspects of people's lives, especially tourism. Restrictions on public mobility from the government during the pandemic have also greatly impacted the hotel industry.[1] Due to the COVID-19 pandemic, the Solo City Government lost around 50% of hotel and restaurant tax revenues, and during the pandemic, the tourism sector was the worst, where hotel occupancy was only 30%–40%, and the Solo City Government lost half. [2]. After the decline in the positive rate of the COVID-19 virus in Indonesia, especially in Surakarta, this city has become one of the cities that has begun to be visited by local and foreign tourists again because of the variety of interesting cultural tourism. The interest of tourists from the millennial generation is a niche market for tourism managers and developers, especially in the new normal era that focuses on tourism revitalization. [1]

With the development of culture and tourist destinations, the city of Solo is also increasingly supporting services, especially hotels. Solo City offers many choices of hotels in various regions, especially in the Laweyan District, with different hotel categories, rental prices, facilities, and services. Starting from jasmine-class hotels to five-star hotels.

The obstacle experienced is the lack of time efficiency in selecting the best hotel according to the desired criteria because it is still done manually and has not used an accurate application in accordance with the specific area desired, so it takes a long time and makes it difficult for visitors to determine hotel selection, and a lack of information about hotels is one of the problems for visitors when coming to the city of Surakarta in determining the selection of hotels that they desire. The number of hotels with many services and benefits makes tourists confused when choosing a hotel, so a system is needed that supports the decision to determine the desired hotel. [3]

Decision Support Systems (DSS) are designed to support all stages of decision-making, from identifying problems, selecting relevant information, determining approaches to be used in the decision-making process, and evaluating alternative options. In the early 1970s, Scott Morton proposed the concept of DSS with the term "Management Decision System", where this system helps decision-making by using data and models to solve unstructured problems. [4], [5]. A decision support system is a system that assists people in determining things based on mathematical calculations.[6]

The goal to be achieved in this study is the use of the Technique for Others Reference by Similarity to Ideal Solution (TOPSIS) and Simple Additive Weighting (SAW) methods in supporting the decision to choose the best hotel in Laweyan District, Surakarta City. Prospective visitors will find it easier to determine hotels that match the desired criteria, such as room rental prices, locations, facilities, and classes. A decision support system is needed as a tool that makes it easier for decision-makers.

TOPSIS method, which is one of the multi-criteria decision-making methods. [7], This method is to choose the best alternative among many alternatives. The alternative that has the smallest distance from the best or positive ideal outcome and has the furthest distance from the

worst or negative ideal outcome is considered the best alternative. [8].

SAW, or weighted summation, has the basic concept of seeking the weighted sum of performance ratings on each alternative on all attributes, the process of normalizing the decision matrix (X) to a scale comparable to all existing alternative ratings. [9], [10].

The application of the ranking method to the decision support system can help determining hotel selection using the combination of the TOPSIS and SAW methods. This research was conducted by finding the normalized matrix value R for each attribute using the SAW method, then continuing with the TOPSIS method to find the selected alternative solution.

METHOD

Research data comes from the place of research, in the form of primary and secondary data, while collecting data by observation at the research destination, namely the tourism office, through interviews, location observations, and literature studies. The design stage involves context diagrams, data flow diagrams, entity relationship diagrams (ERD), system implementation, and validity testing to determine selection using the Saw and Topsis methods in the calculation.

The steps to use the SAW method are determining criteria, determine the match rating of each alternative on each criterion, make a decision matrix based on criteria, then normalize the matrix based on equations that are adjusted to the type of attribute so that a normalized matrix R is obtained.

$$r_{ij} = \begin{cases} \dfrac{X_{ij}}{\max_i X_{ij}} & \text{If } j \text{ is a profit attribute (benefit)} \\ \dfrac{\min_i X_{ij}}{X_{ij}} & \text{If } j \text{ is a cost attribute (cost)} \end{cases} \quad \ldots(1)$$

The final result is obtained from the ranking process, namely the sum of the multiplication of the normalized matrix R with a weight vector, so that the largest value is obtained, which is chosen as the best alternative as a solution. [11]

$$Vi = \sum_{j=1}^{n} Wj\ rij \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

TOPSIS method sSteps are create a matrix r that is a normalized decision matrix and normalize the value of rij using the equation (3).

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}}} \quad \ldots\ldots\ldots\ldots(3)$$

Information:

r_{ij} = Normalized matrix

X_{ij} = conversion in fuzzy form

For the weighting of the normalized matrix, each column on the matrix R is multiplied by the weight (wj) to produce the matrix using the equation.(4)

$$y = \begin{bmatrix} W_1 r_{11} & W_1 r_{12} & W_n r_n \\ W_1 r_{11} & \ldots & \ldots \\ W_j r_{m1} & W_j r_{m2} & W_j r_{mm} \end{bmatrix} \quad \ldots\ldots\ldots(4)$$

Information :

W = Weight value

R = Normalized matrix

Determine the value of a positive ideal solution and a negative ideal solution. Ideal solutions are denoted A+, while negative ideal solutions are

denoted A- using equations (5).

$$A+= \max((y1+y2+,\dots,yn+)$$

$$A-= \max(y1-y2-,\dots,yn-) \quad \text{.....(5)}$$

y = matrix on equation two

Calculating the Distance Between a Positive Ideal Solution (D+) and a Negative Ideal Solution (D-)

$$D_i^+ \sqrt{\sum_{j=1}^{n}\left(A_i^+ - y_{ij}\right)^2;\ i=1,2,\dots,m.} \quad \text{.....(6)}$$

A+ = Positive Ideal Solution Value
A- = negative ideal solution value

Calculating the preference value of each alternative.

$$V_i = \frac{D_i^-}{D_i^- + D_i^+} \quad \text{.....(7)}$$

dimana i=1,2,3,...m

Information
D+ = Positive Ideal Solutio
D- = Negative Ideal Solution

System testing is done using validity testing and McCall. Validity testing is done by comparing the results of manual and application calculations..

The McCall method is one model that describes the software quality factor. This model has three main perspectives, namely product operation (operational properties of software), product revision (the ability of software to undergo change), and product transition (software adaptability to the new environment). Product operation includes several factors, namely correctness, reliability, usability, integrity, and usability. Product revision includes several factors, namely maintainability, flexibility, and testability. Product transition includes several factors, namely portability, reusability, and interoperability. [12][13][14].

RESULT AND DISCUSSION

The data flow in the best hotel selection decision support system application is made in a context diagram, as shown in Image 1. In this system, there are three entities: admin, manager, and user.

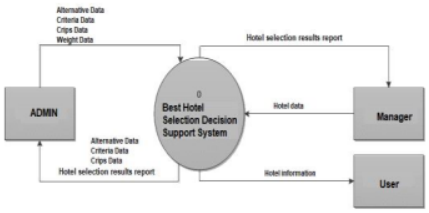

Image 1. Contex Diagram

In accordance with the Entity Relationship Diagram (ERD) in the best hotel selection system, as shown in Image 2, there are 5 entities: hotels, alternatives, criteria, TOPSIS and SAW processes, and crips. Entities form relationships between entities that are connected to each other.

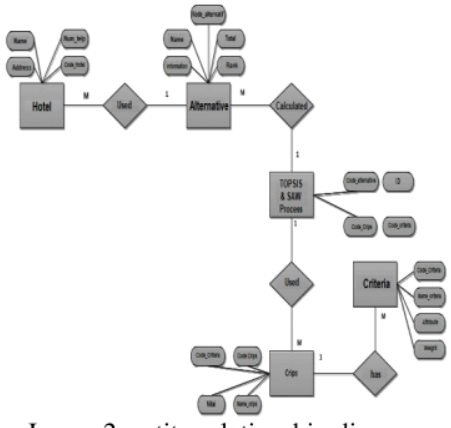

Image 2. entity relationship diagram

Implementation of the use of TOPSIS and SAW methods

The criteria and weights of each criterion, as shown in Table 1, are considered by customers in determining the hotel.

Table 1. Preference Criteria and Weights

Criteria	Cost/ Benefit	Preference Weights (W)
Price (C1)	Cost	4
Location C2)	Benefit	5
Facilities C3)	Benefit	3
Class (C4)	Benefit	2

Use of linkert scales as per importance after weighting the preferences of each criterion.

Score 1 = Very Unimportant
Score 2 = Not Important
Score 3 = Quite Important
Score 4 = Important
Score 5 = Very Important

Table 2 shows the hotels used as a sample, namely 10 hotels in the Laweyan Surakarta area.

Table 2. Hotel Data and Its Criteria

No	Hotel Name	Price (C1) (in thousands of rupiah)	Location (C2)	Facilities (C3)	Class (C4)
1	H1	770–1.700	Close to Hospitals, Malls, Military Regional Commands, Stations, and Tourist Destination Centers (Kampung Batik Laweyan)	Restaurant, swimming pool. Meeting Room, Fitness Center, Wi-Fi	5
2	H2	450–950	Hospitals,Police Stations,Stations, Banks, and Money Changers	Restaurant, Swimming Pool, Meeting Room, Fitness Center, Wi-Fi	4
3	H3	350–650	Stations, hospitals, tourist centers, banks, and police stations	Restaurant, Kolam Renang, Meeting Rooms, Wi-Fi	4
4	H4	264–560	Among banks, delivery services, tourism centers, and shopping centers	Restaurant, Meeting Room, Wi-Fi	3
5	H5	280–555	Delivery Services, Stations, Police Stations, and Hospitals	Restaurant, Kolam Renang, Meeting Room, Wi-Fi	3
6	H6	350–560	Stations, Banks, Hospitals	Restaurant, ,Meeting Room, Wi-Fi	3
7	H7	240–385	Delivery Service, Bank, Money Changer, Cultural Tourism Center (Sriwedari)	Restaurant, Meeting room, Wi-Fi	2
8	H8	120–150	Mall, Bank, Kantor Polisi	Restaurant, Meeting room, Wi-Fi	1
9	H9	100–150	Kantor Polisi, Jasa Pengiriman	Wi-Fi	
10	H10	120–200	Bank, Stasiun	Wi-Fi	

The data in Table 2 is converted into fuzzy form so that the weighting of alternative match criteria is obtained in Table 3.

Table 3. Criteria Weighting

	Keterangan	Nilai Kriteria
C1 Price (in thousands of rupiah)	20–100	1
	100–300	2
	300 –500	3
	500–800	4
	>800	5
C2 Location (distance in kilometers)	≥5 km	1
	4 KM	2
	3 KM	3
	2 KM	4
	≤1 KM	5
C3 Facilities	0 - 0.2	1
	0.201 – 0.4	2
	0.401 – 0.6	3
	0.601 – 0.8	4
	0.801 - 1	5
C4 Class	0 (Non Star)	1
	1	2
	Star Hotels 2-3	3
	4	4
	5	5

In the facility criterion (C3), first calculate the number of hotel facilities. The number of facilities in one hotel will be divided by the largest number of facilities. In this case sample, the most facilities are in H1, with 5 main facilities. Next, determine the match rating of each alternative on each criterion. The determination is made based on the level of importance of the criterion based on the predetermined weight value, as shown in Table 4.

Table 4. Alternate Match Rating Table

Alternative	Kriteria			
	C1 Price	C2 Location	C3 Facilities	C4 Class
H1	5	5	5	5
H2	4	5	5	4
H3	3	5	4	4
H4	3	4	3	3
H5	3	4	4	3

Calculation of SAW and TOPSIS Method

1. Based on Table 4, a decision matrix X was made, so that the X value of the 10 hotels used as a study was obtained as follows :

$$X = \begin{bmatrix} 5 & 5 & 5 & 5 \\ 4 & 5 & 5 & 4 \\ 3 & 5 & 4 & 4 \\ 3 & 4 & 3 & 3 \\ 3 & 4 & 4 & 3 \\ 3 & 3 & 3 & 3 \\ 3 & 4 & 3 & 3 \\ 2 & 3 & 3 & 2 \\ 2 & 2 & 1 & 1 \\ 2 & 2 & 1 & 1 \end{bmatrix}$$

2. Normalization of Decision Matrix R with Formula (1).

a. Price Criteria (Cost)

$$r_{11} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{5} = \frac{2}{5} = 0.4$$
$$r_{21} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{4} = \frac{2}{4} = .5$$
$$r_{31} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{3} = \frac{2}{3} = 0{,}667$$
$$r_{41} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{3} = \frac{2}{3} = 0{,}667$$
$$r_{51} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{3} = \frac{2}{3} = 0{,}667$$
$$r_{61} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{3} = \frac{2}{3} = 0{,}667$$
$$r_{71} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{3} = \frac{2}{3} = 0{,}667$$

$$r_{81} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{2} = \frac{2}{2} = 1$$
$$r_{91} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{2} = \frac{2}{2} = 1$$
$$r_{101} = \frac{\min\{5,4,3,3,3,3,3,2,2,2\}}{2} = \frac{2}{32} = 1$$

b. Location Criteria *(benefit)*

$$r_{12} = \frac{5}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{5}{5} = 1$$
$$r_{22} = \frac{5}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{5}{5} = 1$$
$$r_{32} = \frac{5}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{5}{5} = 1$$
$$r_{42} = \frac{4}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{4}{5} = 0.8$$
$$r_{52} = \frac{4}{max\{5,5,5,4,4,3,4,3,2,2\}} = \frac{4}{5} = 0.8$$
$$r_{62} = \frac{3}{max\{5,5,5,4,4,3,4,3,2,2\}} = \frac{3}{5} = 0.6$$
$$r_{72} = \frac{4}{max\{5,5,5,4,4,3,4,3,2,2\}} = \frac{4}{5} = 0.8$$
$$r_{82} = \frac{3}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{3}{5} = 0.6$$
$$r_{92} = \frac{2}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{2}{5} = 0.4$$
$$r_{102} = \frac{2}{\max\{5,5,5,4,4,3,4,3,2,2\}} \frac{2}{5} = 0.4$$

c. Facility Criteria *(benefit)*

$$r_{13} = \frac{5}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{5}{5} = 1$$
$$r_{23} = \frac{5}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{5}{5} = 1$$
$$r_{33} = \frac{4}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{4}{5} = 0.8$$
$$r_{43} = \frac{3}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{53} = \frac{4}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{4}{5} = 0.8$$
$$r_{63} = \frac{3}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{73} = \frac{3}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{83} = \frac{3}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{93} = \frac{1}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{1}{5} = 0.2$$
$$r_{103} = \frac{1}{\max\{5,5,4,3,4,3,3,3,1,1\}} = \frac{41}{5} = 0.2$$

d. Class Criteria *(benefit)*

$$r_{14} = \frac{5}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{5}{5} = 1$$
$$r_{24} = \frac{4}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{4}{5} = 0.8$$
$$r_{34} = \frac{4}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{4}{5} = 0.8$$
$$r_{44} = \frac{3}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{54} = \frac{3}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{64} = \frac{3}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{74} = \frac{3}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{3}{5} = 0.6$$
$$r_{84} = \frac{2}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{2}{5} = 0.4$$
$$r_{94} = \frac{1}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{1}{5} = 0.2$$
$$r_{104} = \frac{1}{\max\{5,4,4,3,3,3,3,2,1,1\}} = \frac{1}{5} = 0.2$$

The value of the normalized performance rating (rij) forms the normalized matrix (R) as follows:

$$R = \begin{pmatrix} 0.4 & 1 & 1 & 1 \\ 0.5 & 1 & 1 & 0.8 \\ 0.667 & 1 & 0.8 & 0.8 \\ 0.667 & 0.8 & 0.6 & 0.6 \\ 0.667 & 0.8 & 0.8 & 0.6 \\ 0.667 & 0.6 & 0.6 & 0.6 \\ 0.667 & 0.8 & 0.6 & 0.6 \\ 1 & 0.6 & 0.6 & 0.4 \\ 1 & 0.4 & 0.2 & 0.2 \\ 1 & 0.4 & 0.2 & 0.2 \end{pmatrix}$$

A weighted normalized decision matrix using Formula (2). The calculation results of the weighted normalized matrix are shown in Table 5.

Table 5. Weighted Normalized Matrix

Alternative	Criteria			
	Price	Location	Facilities	Class
H1	1.6	5	3	2
H2	2	5	3	1.6
H3	**2,667**	5	2.4	1.6
H4	**2,667**	4	1.8	1.2
H5	**2,667**	4	2.4	1.2

Determining the Positive Ideal Solution Matrix A+ and the Negative Ideal Matrix The largest value is then chosen as the positive ideal, while the

smallest is considered negative. The determination of this matrix uses Formula (3), and the result of the calculation is shown in Table 6.

Table 6. Matrix of Positive and Negative Ideal Solutions

A+	4	5	3	2
A-	1,6	2	0,6	0,4

The next step is to determine the distance between the ideal solution of positive D+ and the ideal solution of negative D using Formula (4). In Table 7, it is the result of the calculation of determining the distance between the positive and negative ideal solutions.

Table 7. Distance of positive ideal solution and negative ideal solution

Alter-native	Positive Distance D+	Negative Distance D-
H1	2.4	4.16173040933696
H2	2.03960780543711	4.04474968323134
H3	1.51584226678694	3.84938667553388
H4	2.20403670064221	2.68659222394798
H5	1.9436506316151	3.00296150121472

Determination of preference values for each alternative using Formula (5) and calculation results as in Table 8.

Table 8. Final Results of Ranking

No	Hotel	Preference Weight Value	Rank
V_1	H1	0.634242821590942	3
V_2	H2	0.664778440577219	2
V_3	***H3***	**0.717469229536505**	***1***
V_4	H4	0.549334710396804	5
V_5	H5	0.607074381531671	4

From the value of V in table 8, the results of Hotel H3 (V3) are obtained, which have the largest value of other alternatives, so it can be concluded that Hotel H3 is the best choice according to the weight of the criteria.

Program Implementation

In the program application, there is a login form that is used by administrators to access and manage applications. In the alternative data menu in Image 3, the admin inputs various hotel alternatives in the form of several hotel name codes, selection dates, and descriptions; after that, the data can be added, saved, changed, and deleted.

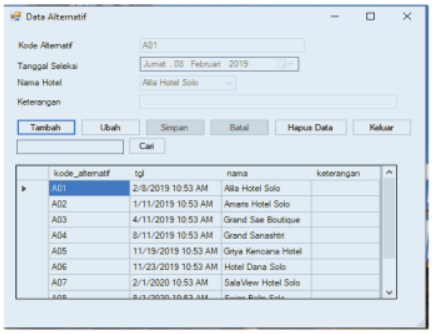

Image 3. Alternative Form

The Criteria page in Image 4 serves to input the criteria that have been used, can also add criteria that you want to enter, and can also change the criteria and save the criteria that have been created earlier.

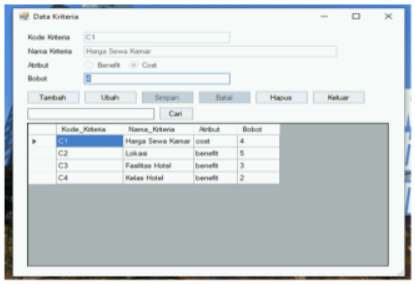

Image 4. Criteria Form

The Crips menu in Image 5 is a description of the existing criteria and assigns a weight value to each criterion. The process of adding crips values from

price to class can be done, and you can change, save, and delete them.

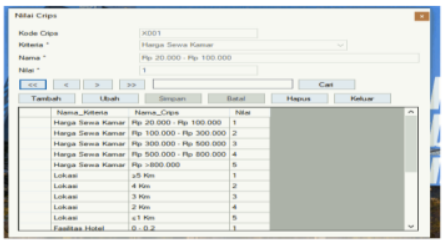

Image 5. Crips Form

The Alternate Relationship menu (weights) in Image 6 contains a list of hotels that have been entered, then sorted according to the weight values that have been written in the crips data above, then sorted from lowest to highest.

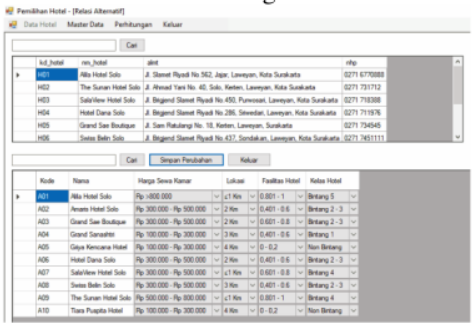

Image 6. Criteria WeightForm

The calculation form is used to find the selection results. At this stage, the program uses the SAW and Topsis methods in the process shown in Image 7.

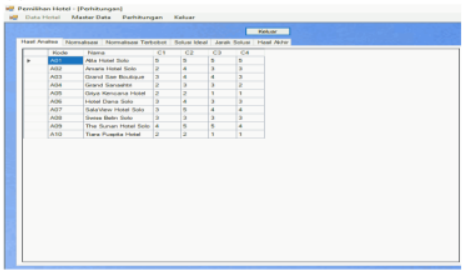

Image 7. Selection Process Form

The selection result form in Image 8 is used to report the selection result data by displaying the selection of images on the screen according to the desired results according to the criteria.

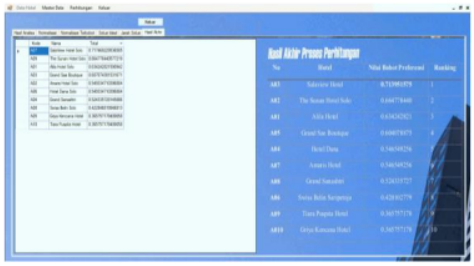

Image 8. Selection Results Report Display

System Testing

Validity testing uses three hotel samples to be used as alternatives in calculations. Table 9 is a table of validity calculations, namely between manual calculations and systems or applications.

Table 9. Results of Manual and System Calculations

No	Alter-native Name	System Results	Manual Results	Result
1	H1	0.634242821590942	0.634242821590942	Appropriate
2	H2	0.717469229536505	0.717469229536505	Appropriate
3	H3	0.664778440577219	0.664778440577219	Appropriate

As per Table 9, the validity results in Alternative 1 system result 0.634242821590942 and manual result 0.634242821590942, Alternative 2 0.717469229536505 System result and manual 0.717469229536505, Alternative 3 0.664778440577219 system and manual are the same.

Based on the results of the analysis and test results above, it can be concluded that the application of the decision support system for choosing the best hotel in the Laweyan Surakarta District Area with topsis and saw methods can be applied in the selection of hotels according to the criteria of its use.

System testing with McCall, testing only tests from a product operation perspective. The respondents used were eight people. The instrument used in this study was a Likert scale with a score between 1 and 5. The weight (w) of each criterion (0.1<= w <=0.4) is based on importance. They range from very unimportant to very important. While the eligibility categories are as shown in Table 10.

Table 10. Eligibility Categories

Category	Percentage
Excellent	81% - 100%
Good	61% - 80%
Good	41% - 60%
Bad	21% - 40%
Very Not Good	< 21%

The calculation results by the McCall method are as shown in Table 11.

Tabel 11. Hasil Uji McCall

No	Indicator	McCall Test Results
1.	Correctness	77%
2.	Reliability	83%
3.	EEfficiency	85%
4.	Integrity	99%
5.	Usability	88%
	Average	86%

If the percentage of McCall Test Results with 5 indicators, namely accuracy, reliability, efficiency, integrity, and use, averages 86%, then this system is categorized as very good.

CONCLUSION

Application of the SAW and TOPSIS Method in the selection of hotels in the Laweyan District Area of Surakarta City, with the criteria used being room rental prices, locations, facilities, and classes, Normalization that has been carried out through the SAW method is then continued with the provision of preference weights and criteria weights and then continued with ranking through the Topsis method, and a desired hotel recommendation will be produced.

Based on the results of validity testing, the first rank was obtained from H2 with a value of 0.717469229536505, the second was obtained from H3 with a value of 0.664778440577219, and the third was obtained from H1 with a value of 0.634242821590942.

McCall Test Results with 5 indicators, namely accuracy, reliability, efficiency, integrity, and usability, average 86%, then this system is categorized as very good.

.

BIBLIOGRAPHY

[1] Vishnu, "Tren Solo Traveler Dalam Minat Berwisata Di Era New Normal : Perspektif Generasi Milenial."

[2] M. Ricky PD, "Pemkot Solo Kehilangan 50% Pendapatan Pajak Hotel dan Restoran Gara-Gara Pandemi," Solopos.com. Accessed: Jan. 13, 2023. [Online]. Available: https://www.solopos.com/pemkot-solo-kehilangan-50-pendapatan-pajak-hotel-dan-restoran-gara-gara-pandemi-1087940

[3] Y. S. Pasaribu, "Sistem Pendukung Keputusan Pemilihan Hotel Bintang Lima Terbaik Di Kota Medan Menggunakan Metode Promethee," *J. Pelita Inform.*, vol. I, no. 1, pp. 395–403, 2019.

[4] E. Turban, J. E. Aronson, and T. P. Liang, "Decision Support and Intelligrnt System ." 2007.

[5] V. D. Iswari, F. Y. Arini, and M. A. Muslim, "Decision Support System for the Selection of Outstanding Students Using the AHP-TOPSIS Combination Method," *Lontar Komput. J. Ilm. Teknol. Inf.*, vol. 10, no. 1, p. 40, 2019, doi: 10.24843/lkjiti.2019.v10.i01.p05.

[6] R. W. Putra and U. D. Rosiani, "Sistem Pendukung Keputusan Rekomendasi Pekerjaan Bagi Fresh Graduate Dengan Penggabungan SAW Dan TOPSIS," *POSITIF J. Sist. dan Teknol. Inf.*, vol. 7, no. 1, pp. 44–50, 2021, doi: 10.31961/positif.v7i1.1092.

[7] Y. Çelikbilek and F. Tüysüz, "An in-depth review of theory of the TOPSIS method: An experimental analysis," *J. Manag. Anal.*, vol. 7, no. 2, pp. 281–300, 2020, doi: 10.1080/23270012.2020.1748528.

[8] M. Mathew, R. K. Chakrabortty, and M. J. Ryan, "A novel approach integrating AHP and TOPSIS under spherical fuzzy sets for advanced manufacturing system selection," *Eng. Appl. Artif. Intell.*, vol. 96, no. October, p. 103988, 2020, doi: 10.1016/j.engappai.2020.103988.

[9] N. Setiawan *et al.*, "Simple additive weighting as decision support system for determining employees salary," *Int. J. Eng. Technol.*, vol. 7, no. 2.14 Special Issue 14, pp. 309–313, 2018.

[10] F. Haswan, "Decision Support System For Election Of Members Unit Patients Pamong Praja," *Int. J. Artif. Intell. Res.*, vol. 1, no. 1, p. 21, 2017, doi: 10.29099/ijair.v1i1.14.

[11] A. M. Baihaqi, "Sistem Pendukung Keputusan Untuk Pemilihan Hotel Dengan Simple Additive Weighting (SAW) Berbasis WEB," *Semin. Nas. Teknol. Inf. dan Multimed.*, pp. 6–7, 2018.

[12] Fahmi Sulaiman, Nana Suarna, and Iin, "Pengukuran Kualitas Perangkat Lunak Sistem Informasi Pengarsipan Dokumen Laporan Jalan Tol Menggunakan Metode Mccall," *INFOTECH J.*, vol. 8, no. 1, pp. 34–40, 2022, doi: 10.31949/infotech.v8i1.2234.

[13] A. Suhari Camara M, K. Aelani, and F. Dwi Juniar S, "Pengujian Kualitas Website menggunakan Metode McCall Software Quality," *J. Inf. Technol.*, vol. 3, no. 1, pp. 25–32, 2021, doi: 10.47292/joint.v3i1.43.

[14] S. A. Saputera, D. Sunardi, A. Syafrizal, and P. Samsidi, "Evaluasi Sistem Informasi Akademik Menggunakan Metode Mccall," *J. Technopreneursh. Inf. Syst.*, vol. 3, no. 2, pp. 9–16, 2020, doi: 10.36085/jtis.v3i2.878.

Jurteki-Sis-Samuel-Setiyo-Andri.doc

ORIGINALITY REPORT

14%
SIMILARITY INDEX

PRIMARY SOURCES

1	Mihuandayani, Herda D. Ramandita, Arief Setyanto, Ikhwan B. Sumafta. "Food trend based on social media for big data analysis using K-mean clustering and SAW: A case study on yogyakarta culinary industry", 2018 International Conference on Information and Communications Technology (ICOIACT), 2018 Crossref	55 words — 1%
2	garuda.kemdikbud.go.id Internet	52 words — 1%
3	journal.unnes.ac.id Internet	42 words — 1%
4	ejournals.itda.ac.id Internet	29 words — 1%
5	books.akademisyen.net Internet	26 words — 1%
6	repository.its.ac.id Internet	26 words — 1%
7	dinastipub.org Internet	25 words — 1%
8	publikasi.lldikti10.id Internet	25 words — 1%

9	Ebru Aydoğdu, Elif Güner, Başak Aldemir, Halis Aygün. "Complex spherical fuzzy TOPSIS based on entropy", Expert Systems with Applications, 2023 Crossref	24 words — 1%
10	Afrianda Cahyapratama, Riyanarto Sarno. "Application of Analytic Hierarchy Process (AHP) and Simple Additive Weighting (SAW) methods in singer selection process", 2018 International Conference on Information and Communications Technology (ICOIACT), 2018 Crossref	19 words — 1%
11	Rofik Sinung Basuki, Nur Khaririyatun, Rinda Kirana, Harmanto, M. Thamrin. "Farmers' Preferences on the Quality of Indonesian Chili's Varieties for Developing New Varieties", IOP Conference Series: Earth and Environmental Science, 2022 Crossref	17 words — < 1%
12	S Saifulloh, R Pamungkas, M Lenawati. "Decision support system with TOPSIS method for lecturer appraisal in Universitas PGRI Madiun", Journal of Physics: Conference Series, 2019 Crossref	17 words — < 1%
13	Wahyu Widodo, Adhitya Pratama. "Decision Support System for Purchasing Speaker Monitor Home Recording Using Fuzzy Multiple Attribute Decision Making", JEECS (Journal of Electrical Engineering and Computer Sciences), 2023 Crossref	17 words — < 1%
14	www.coursehero.com Internet	16 words — < 1%
15	www.mdpi.com Internet	14 words — < 1%

16	"Infrastructure and Technology Management", Springer Science and Business Media LLC, 2018 Crossref	13 words — < 1%
17	ejournal.seaninstitute.or.id Internet	12 words — < 1%
18	repository.uph.edu Internet	10 words — < 1%
19	www.grafiati.com Internet	10 words — < 1%
20	A D Indriyanti, D R Prehanto, I G L E P Prismana, Soeryanto, B Sujatmiko, J Fikandda. "Simple Additive Weighting algorithm to aid administrator decision making of the underprivileged scholarship", Journal of Physics: Conference Series, 2019 Crossref	9 words — < 1%
21	documents.mx Internet	9 words — < 1%
22	Hricovíni, Miloš. "Effect of Solvent and Counterions upon Structure and NMR Spin–Spin Coupling Constants in Heparin Disaccharide", The Journal of Physical Chemistry B, 2011. Crossref	8 words — < 1%
23	Sari Wahyuni Eka, Fauziati Silmi. "The Selection of Periodic Salary Increment of Civil Servants using Fuzzy MADM", 2019 4th International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE), 2019 Crossref	8 words — < 1%

24 Ika P. N. Purnama, L. M. Fid Aksara, Statiswaty, Rizal Adi Saputra, Ricky Ramadhan. "Decision Suport System to Increase Salary of Bank Sultra's Teller Employee with Performance Assessment Parameters Using Fuzzy Tahani Method and Simple Adaptive Weighting", Proceedings of the 2019 5th International Conference on Computing and Artificial Intelligence - ICCAI '19, 2019 — 7 words — < 1%
Crossref

25 Mithat Zeydan. "A new decision support system for performance measurement using combined fuzzy TOPSIS/DEA approach", International Journal of Production Research, 04/14/2009 — 7 words — < 1%
Crossref

26 Fransiskus Xaverius, Reza Zubaedah, Yesenia Resubun. "Decision Support Systems Suitability in Agarwood Tree Planting Using Simple Additive Weighting Method (Saw) In Merauke District", E3S Web of Conferences, 2021 — 6 words — < 1%
Crossref

27 S. Mishra, S. Datta, S.S. Mahapatra. "Grey-based and fuzzy TOPSIS decision-making approach for agility evaluation of mass customization systems", Benchmarking: An International Journal, 2013 — 6 words — < 1%
Crossref

EXCLUDE QUOTES OFF
EXCLUDE SOURCES OFF
EXCLUDE BIBLIOGRAPHY OFF
EXCLUDE MATCHES OFF