

## DECISION SUPPORT SYSTEM TO DETERMINE THE LOCATION NEW CAFE SUNCAFE AS A TOURIST CULINARY TOUR IN DISTRICT PRINGSEWU BY USING SIMPLE ADDITIVE WEIGHTING

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### Abstract

District Pringsewu is growing that are doing development of various sectors, one of the tourism sectors. Culinary tourism in the District Pringsewu growing quite rapidly, has a lot of standing places that sell a lot of food choices, from street vendors to modern eating places like cafes. Many cafes in the district of Pringsewu would be a separate issue in determining the appropriate location for the new cafe location Suncafe, for it needed a system that could help determine the location of a new cafe. The criteria used in making this decision support system include building area, spacious parking, accessibility, security, distance to the city center, the price of the location, and comfort. Decision support system is made using a simple additive weighting method (SAW) is looking for a weighted sum of the performance of each alternative. While the implementation of the program for decision support system is made by using Delphi 7. Obtained 3 major end result rankings to determine the locations of a new cafe, there are 1. District Pagelaran with a value of 80, 2 District Gadingrejo with a value of 79, and 3 districts Adiluwih with a value of 78.55.

Keywords: Decision Support Systems, Location Cafe, SAW, Pringsewu.

## 1.0 INTRODUCTION

### 1.1. Background

Pringsewu is growing districts that are doing development of various sectors, one of the tourism sectors. Based on Law No. 10 of 2009 Article 14 Paragraph 1 states that a food and beverage service is one of the tourism businesses. [1] Cafe is a place that provides food and drinks with a modern concept. So the cafe is one of the tourism businesses to enrich the culinary tourism destinations in District Pringsewu. Culinary tourism in the District Pringsewu growing quite rapidly has a lot of standing places that sell a lot of food choices, from street vendors to modern places like cafes. Many cafes in the district of Pringsewu would be a separate issue in determining the appropriate location for the new cafe location Suncafe, for it needed a system that could help determine the location of a new cafe. Decision support system is used so that a system that can be developed by using technology as a form of information systems with DSS, namely by collecting data that will be used as a decision-making such as building area, spacious parking, accessibility, security, distance to the city center, the price of the location, and comfort. In this study tries to make the right decision in determining the location of a new cafe as a culinary tourism destinations in District Pringsewu by using simple weighting additive weighting method.

### 1.2. Problem Formulation

Based on the background above, the formula problems to be solved is how to design a decision support system using a simple additive weighting method to determine the location of a new cafe called Suncafe.

## **2.0 THEORETICAL**

### **2.1. Decision Support Systems**

Decision support system (DSS) are usually constructed to support a solution to a problem or to evaluate an opportunity. A DSS application is used in decision making. DSS applications used data, providing convenience for the user, and can combine thinking decision makers. [4]

### **2.2. The concept of Decision Support Systems (DSS)**

#### **2.2.1. Objective Decision Support System**

The purpose of the decision support system is as follows:

1. Assist the manager in making decisions on issues of semi-structured
2. Provide support to manager considerations and is not intended to replace the function of the manager
3. Improve the effectiveness of decisions made managers more than efficiency improvements
4. Computing speed.
5. Increased productivity[5]

#### **2.2.2. Decision Making Process**

The decision making process is divided into four phases:

1. Intelligence, is the process of search and detection of the scope of the problems and the process of recognition of the problem. Data input is obtained, processed, and tested in order to identify the problem.
2. Design, namely the process of discovering, developing, and analyzing alternative actions that can be performed include a process to understand the problem, lowering solutions and test the feasibility of the solution.
3. Choice, namely the electoral process among the various alternative actions that may be executed and implemented in the decision making process[6]

### **2.3. Culinary Tourism**

Culinary tours are traveling together to expand knowledge about the food. [7] The need to be prepared if it will conduct a culinary tour include:

1. Determine the location of culinary tourism. Looking for a culinary tourist sites should be wise. Choose an area that has special food that is only found in the area. For example, to enjoy satay padang not need go to the field because of the food that was in the area in addition to Padang.
2. Finding information. Find out which foods are a favorite and distinctive in place that will be addressed, if the food is made of, and how to cook it. Do not let the location so had to eat because the menu provided not according to taste. In searching for information also need to know the exact address and price menu is offered.
3. Setting up a fund (budget). Having been informed of the price of the food that will be addressed, then set up the fund. Keep in mind, be sure to allow a larger budget than previous calculations. This is to anticipate the unexpected things. Budget must be prepared in accordance with the revenue per month.

### **2.4. District Pringsewu**

Pringsewu is one district in Lampung province, Indonesia. This district was passed into the district in the DPR Plenary Session on October 29, 2008, as a division of Tanggamus. The county is situated 37 kilometers west of Bandar Lampung, the provincial capital. Currently Pringsewu approved as a separate district for a good development, both in terms of revenues, economic and educational level of the population. The main livelihood is farming and trade Pringsewu. Pringsewu District has an area of 625 km<sup>2</sup>, which consists of 96 pekon (village), and 5 villages, spread over nine districts, namely Sub Pringsewu, performances, Pardasuka, Gadingrejo, Sukoharjo, Ambarawa, Adiluwih, Northern District of Banyumas and performances. In terms of area, District Pringsewu currently the smallest district, as well as in the populous province of Lampung. [8]

## **3.0 METHODOLOGY**

### **3.1 Data Collection**

At this stage of data collection for the preparation of the research is done by:

1. Method of observation, namely direct observation of the locations that will be used as a cafe or object some problems in the field Pringsewu district.
2. The method of interview (interview), which is the process of collecting data by interviewing people around the location which will be used as cafe.
3. The method of literature study, by doing research into the library, browsing the Internet in particular is concerned about the material that made the study.

### 3.2 Metode Simple Additive Weighting

The basic concept is simple additive weighting (SAW) is looking for a weighted sum of the performance of each alternative. SAW method requires a process of normalizing the decision matrix (X) to a scale that can be compared with all the ratings of existing alternatives.

Where  $r_{ij}$  is normalized performance rating of alternative  $A_i$  on  $C_j$  attributes:  $i = 1, 2, \dots, m$  and  $j = 1, 2, \dots, n$ . Value of preference for each alternative ( $V_i$ ) is given as follows:

$$V_i = \sum_j^n = 1 W_{j,r_{ij}} \dots\dots\dots [2]$$

Information:

- $V_i$  = ranking for each alternative
- $W_j$  = weight value of each criterion
- $R_{ij}$  = value ranking of normalized values

$V_i$  larger value indicates that the value of  $A_i$  is selected. The steps in the completion of use are:

1. Determining the alternative, namely  $A_i$ .
2. Determine the criteria that will be used as a reference in the decision, namely  $C_j$ .
3. Provide rating matches the value of each alternative on each criterion.
4. Determine the weight of preference or level of interest ( $W$ ), each criterion  $W = [W_1, W_2, W_3, \dots, W_J]$ .
5. Create a table rating the suitability of each alternative on each criterion.
6. Make a decision matrix ( $X$ ) which is formed from a table rating the suitability of each alternative on each criterion.  $X$  value of each alternative ( $A_i$ ) on each criterion ( $C_j$ ) is already determined, where  $i = 1, 2, \dots, m$  and  $j = 1, 2, \dots, n$ .
7. Normalizing the decision matrix by calculated the value of normalized performance rating ( $r_{ij}$ ) of the alternative  $A_i$  on criteria  $C_j$ .

Information:

1. Criteria gains if the value of benefits for decision makers, otherwise the criteria of cost, if at a cost to the decision maker.
2. If such criteria profits then divided by the value of each column, while for the criteria of cost, the value of each column divided by the value.
3. The results of the value of normalized performance rating ( $r_{ij}$ ) form a matrix normalized ( $R$ ).
4. Outcome of preference value ( $V_i$ ) obtained from the sum of the normalized matrix multiplication element row ( $R$ ) with a weight of preference ( $W$ ) corresponding column of the matrix element ( $W$ ).

The calculation result  $V_i$  greater value indicates that the alternative  $A_i$  is the best alternative. [2]

### 3.3. Data Analysis

#### 3.3.1. Input Requirements Analysis

Input to the decision making process of some of these alternatives is the use of variables. Variables required are as follows:

1. Building area
2. Parking Area
3. Accessibility
4. Security

5. The distance to the city center
6. Price location
7. Comfortable

### 3.3.2. Output Requirements Analysis

The output generated from this study is an alternative that has the highest value compared to other value alternative. The final results released by the later program derived from the value of each criterion, because in each criterion has a different value.

## 4.0 RESULTANTS AND DISCUSSION

### 4.1. Weights and Criteria

In determining the location of a new cafe is using a simple additive weighting need criteria for calculating weights so that the best alternative would be obtained. There are seven attributes (criteria) decision, namely:

- C1 = Building = 20%
- C2 = Area Parking = 20%
- C3 = Accessibility = 15%
- C4 = Security = 10%
- C5 = Distance to the City Center = 15%
- C6 = Price Location = 10%
- C7 = Comfort = 10%

And there are nine alternative decision-making, namely:

- A1 = district Pringsewu
- A2 = district Gadingrejo
- A3 = district Ambarawa
- A4 = district Pardasuka
- A5 = district Exhibition
- A6 = district Banyumas
- A7 = district Adiluwih
- A8 = district Sukoharjo
- A9 = district North Pagelaran

From each of the criteria will be determined the weight of its value:

1. Very low (SR) = 0
2. Low (R) = 2
3. Medium (S) = 3
4. Height (T) = 4
5. Very High (ST) = 5

The following is a table of Building criterion (C1) with a weight of its value as follows:

Table 1 Building Area (C<sub>1</sub>)

No	Building area	Value
1	100 m <sup>2</sup>	2
2	200 m <sup>2</sup>	3
3	300 m <sup>2</sup>	4
4	> 400 m <sup>2</sup>	5

The following is a table of criteria parking area (C2) with a weight of its value as follows:

Table 2 Parking area

No	Parking area	Value
1	5 m <sup>2</sup>	2
2	6 m <sup>2</sup>	3
3	7 m <sup>2</sup>	4
4	> 8 m <sup>2</sup>	5

The following is a table of the criteria of accessibility (C3) with a weight value as follows:

Table 3 Aksesibility

No	Accessibility	Value
1	Hard	2
2	Medium	3
3	Easy	4
4	Very easy	5

There is a table of Security criteria (C4) with a weight of value as follows:

Table 4 Security

No	Security	value
1	Low	2
2	Medium	3
3	High	4
4	Very high	5

The following is a table of the criteria of distance to City Center (C5) with weighting values as follows:

Table 5 Distances to the City Center

No	Distances to the City Center	Nilai
1	Far	2
2	Medium	3
3	Near	4
4	Very Near	5

The following is a table of criteria Price Location (C6) with a weight value as follows:

Tabel 6 Price Location

No	Price Location	Value
1	Expensive	2
2	Medium	3
3	Cheap	4
4	Very cheap	5

The following is a table of criteria Comfort (C7) with weighting value as follows:

Table 7 Comfort

No	Comfort	Value
1	Not Comfort	2
2	Medium	3
3	Comfort	4
4	Very Comfort	5

After the criteria and the weighting of each criterion has been defined then the following steps to resolve it:

Table 8 Rating Matches on each criterion

Alternative	Criteria						
	C1	C2	C3	C4	C5	C6	C7
Pringsewu	4	3	5	4	5	5	5
Gadingrejo	4	4	5	4	5	5	5
Ambarawa	5	3	2	3	4	4	3
Pardasuka	3	4	2	2	2	3	3
Pagelaran	4	5	5	3	5	4	4
Banyumas	3	4	2	3	3	3	3
Adiluwih	5	4	3	3	3	3	3
Sukoharjo	5	3	4	4	4	4	4
Pagelaran Utara	3	5	2	2	2	3	2

Then determine the weight of preference or level of interest (W) to each of the following criteria:  
 $W = [20, 20, 15, 10, 15, 10, 10]$

Make a decision matrix X formed from rating table suitability of each alternative on each of the following criteria

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

Normalizing the decision matrix X by calculating the value of normalized performance rating (Rij) of the alternative Ai on criteria Cj. With the formula:

$$R_{ij} = X_{ij} \text{ if } j \text{ is the criterion of profit Maxi } (X_{ij}) \text{ (benefit) ..... [9]}$$

or:

$$R_{ij} = \text{Mini } (X_{ij}) \text{ if } j \text{ is the criterion costs } X_{ij} \text{ (cost) ..... [9]}$$

Information:

- Rij = value normalized performance rating
- Xij = value attribute possessed of every criteria
- Maxi Xij = largest value of each criterion
- Mini Xij = smallest value of each criterion
- Benefit = if the greatest value is the best
- Cost = if the smallest value is the best

It said the criteria of profit if the value  $X_{ij}$  benefit decision makers, otherwise the criteria of cost, if  $X_{ij}$  costing the decision makers. If the criteria profits then divided by the value  $X_{ij}$  Maxi ( $X_{ij}$ ) dri each column, while the cost criterion value Mini ( $X_{ij}$ ) of each column divided by the value  $X_{ij}$ .

Moreover criteria of building, parking area, accessibility, security, and Comfort including criteria for benefit. While the criteria of distance to the City Centre and price criteria Location is cost. Calculation of normalization matrix X for each criterion is as follows:

a. Building Area

$$R_{11} = \frac{4}{\max(4,4,5,3,4,3,5,5,3)} = \frac{4}{5} = 0.8$$

$$R_{21} = \frac{4}{\max(4,4,5,3,4,3,5,5,3)} = \frac{4}{5} = 0.8$$

$$R_{31} = \frac{5}{\max(4,4,5,3,4,3,5,5,3)} = \frac{5}{5} = 1$$

$$R_{41} = \frac{3}{\max(4,4,5,3,4,3,5,5,3)} = \frac{3}{5} = 0.6$$

$$R_{51} = \frac{4}{\max(4,4,5,3,4,3,5,5,3)} = \frac{4}{5} = 0.8$$

$$R_{61} = \frac{3}{\max(4,4,5,3,4,3,5,5,3)} = \frac{3}{5} = 0.6$$

$$R_{71} = \frac{5}{\max(4,4,5,3,4,3,5,5,3)} = \frac{5}{5} = 1$$

$$R_{81} = \frac{5}{\max(4,4,5,3,4,3,5,5,3)} = \frac{5}{5} = 1$$

$$R_{91} = \frac{3}{\max(4,4,5,3,4,3,5,5,3)} = \frac{3}{5} = 0.6$$

b. Parking Area

$$R_{12} = \frac{3}{\max(3,4,3,4,5,4,4,3,5)} = \frac{3}{5} = 0.6$$

$$R_{22} = \frac{4}{\max(3,4,3,4,5,4,4,3,5)} = \frac{4}{5} = 0.8$$

$$R_{32} = \frac{3}{\max(3,4,3,4,5,4,4,3,5)} = \frac{3}{5} = 0.6$$

$$R_{42} = \frac{4}{\max(3,4,3,4,5,4,4,3,5)} = \frac{4}{5} = 0.8$$

$$R_{52} = \frac{5}{\max(3,4,3,4,5,4,4,3,5)} = \frac{5}{5} = 1$$

$$R_{62} = \frac{4}{\max(3,4,3,4,5,4,4,3,5)} = \frac{4}{5} = 0.8$$

$$R_{72} = \frac{4}{\max(3,4,3,4,5,4,4,3,5)} = \frac{4}{5} = 0.8$$

$$R_{82} = \frac{3}{\max(3,4,3,4,5,4,4,3,5)} = \frac{3}{5} = 0.6$$

$$R_{92} = \frac{5}{\max(3,4,3,4,5,4,4,3,5)} = \frac{5}{5} = 1$$

c. Accessibility

$$R_{13} = \frac{5}{\max(5,5,2,2,5,2,3,4,2)} = \frac{5}{5} = 1$$

$$R_{23} = \frac{5}{\max(5,5,2,2,5,2,3,4,2)} = \frac{5}{5} = 1$$

$$R_{33} = \frac{2}{\max(5,5,2,2,5,2,3,4,2)} = \frac{2}{5} = 0.4$$

$$R_{43} = \frac{2}{\max(5,5,2,2,5,2,3,4,2)} = \frac{2}{5} = 0.4$$

$$R_{53} = \frac{5}{\max(5,5,2,2,5,2,3,4,2)} = \frac{5}{5} = 1$$

$$R_{63} = \frac{2}{\max(5,5,2,2,5,2,3,4,2)} = \frac{2}{5} = 0.4$$

$$R_{73} = \frac{3}{\max(5,5,2,2,5,2,3,4,2)} = \frac{3}{5} = 0.6$$

$$R_{83} = \frac{4}{\max(5,5,2,2,5,2,3,4,2)} = \frac{4}{5} = 0.8$$

$$R_{93} = \frac{2}{\max(5,5,2,2,5,2,3,4,2)} = \frac{2}{5} = 0.4$$

d. Security

$$R_{14} = \frac{4}{\max(4,4,3,2,3,3,3,4,2)} = \frac{4}{4} = 1$$

$$R_{24} = \frac{4}{\max(4,4,3,2,3,3,3,4,2)} = \frac{4}{4} = 1$$

$$R_{34} = \frac{3}{\max(4,4,3,2,3,3,3,4,2)} = \frac{3}{4} = 0.75$$

$$R_{44} = \frac{2}{\max(4,4,3,2,3,3,3,4,2)} = \frac{2}{4} = 0.5$$

$$R_{54} = \frac{3}{\max(4,4,3,2,3,3,3,4,2)} = \frac{3}{4} = 0.75$$

$$R_{64} = \frac{3}{\max(4,4,3,2,3,3,3,4,2)} = \frac{3}{4} = 0.75$$

$$R_{74} = \frac{3}{\max(4,4,3,2,3,3,3,4,2)} = \frac{3}{4} = 0.75$$

$$R_{84} = \frac{4}{\max(4,4,3,2,3,3,3,4,2)} = \frac{4}{4} = 1$$

$$R_{94} = \frac{2}{\max(4,4,3,2,3,3,3,4,2)} = \frac{2}{4} = 0.5$$

5. Distances to the City Center

$$R_{15} = \frac{\min(5,5,4,2,5,3,3,4,2)}{5} = \frac{2}{5} = 0.4$$

$$R_{25} = \frac{\min(5,5,4,2,5,3,3,4,2)}{5} = \frac{2}{5} = 0.4$$

$$R_{35} = \frac{\min(5,5,4,2,5,3,3,4,2)}{4} = \frac{2}{4} = 0.5$$

$$R_{45} = \frac{\min(5,5,4,2,5,3,3,4,2)}{2} = \frac{2}{2} = 1$$

$$R_{55} = \frac{\min(5,5,4,2,5,3,3,4,2)}{5} = \frac{2}{5} = 0.4$$

$$R_{65} = \frac{\min(5,5,4,2,5,3,3,4,2)}{3} = \frac{2}{3} = 0.67$$

$$R_{75} = \frac{\min(5,5,4,2,5,3,3,4,2)}{3} = \frac{2}{3} = 0.67$$

$$R_{85} = \frac{\min(5,5,4,2,5,3,3,4,2)}{4} = \frac{2}{4} = 0.5$$

$$R_{95} = \frac{\min(5,5,4,2,5,3,3,4,2)}{2} = \frac{2}{2} = 1$$

e. Price Location

$$R_{16} = \frac{\min(5,5,4,3,4,3,3,4,3)}{5} = \frac{3}{5} = 0.6$$

$$R_{26} = \frac{\min(5,5,4,3,4,3,3,4,3)}{5} = \frac{3}{5} = 0.6$$

$$R_{36} = \frac{\min(5,5,4,3,4,3,3,4,3)}{4} = \frac{3}{4} = 0.75$$

$$R_{46} = \frac{\min(5,5,4,3,4,3,3,4,3)}{3} = \frac{3}{3} = 1$$

$$R_{56} = \frac{\min(5,5,4,3,4,3,3,4,3)}{4} = \frac{3}{4} = 0.75$$

$$R_{66} = \frac{\min(5,5,4,3,4,3,3,4,3)}{3} = \frac{3}{3} = 1$$

$$R_{76} = \frac{\min(5,5,4,3,4,3,3,4,3)}{3} = \frac{3}{3} = 1$$

$$R_{86} = \frac{\min(5,5,4,3,4,3,3,4,3)}{4} = \frac{3}{4} = 0.75$$

$$R_{96} = \frac{\min(5,5,4,3,4,3,3,4,3)}{3} = \frac{3}{3} = 1$$

f. Comfortable

$$R_{17} = \frac{5}{\max(5,5,3,3,4,3,3,4,2)} = \frac{5}{5} = 1$$

$$R_{27} = \frac{5}{\max(5,5,3,3,4,3,3,4,2)} = \frac{5}{5} = 1$$

$$R_{37} = \frac{3}{\max(5,5,3,3,4,3,3,4,2)} = \frac{3}{5} = 0.6$$

$$R_{47} = \frac{3}{\max(5,5,3,3,4,3,3,4,2)} = \frac{3}{5} = 0.6$$

$$R_{57} = \frac{4}{\max(5,5,3,3,4,3,3,4,2)} = \frac{4}{5} = 0.8$$

$$R_{67} = \frac{3}{\max(5,5,3,3,4,3,3,4,2)} = \frac{3}{5} = 0.6$$

$$R_{77} = \frac{3}{\max(5,5,3,3,4,3,3,4,2)} = \frac{3}{5} = 0.6$$

$$R_{87} = \frac{4}{\max(5,5,3,3,4,3,3,4,2)} = \frac{4}{5} = 0.8$$

$$R_{97} = \frac{2}{\max(5,5,3,3,4,3,3,4,2)} = \frac{2}{5} = 0.4$$

Results of the value of normalized performance rating (Rij) form a matrix normalized (R), namely:

$$R = \begin{pmatrix} 0.8 & 0.8 & 1 & 0.6 & 0.8 & 0.6 & 1 & 1 & 0.6 \\ 0.6 & 0.8 & 0.6 & 0.8 & 1 & 0.8 & 0.8 & 0.6 & 1 \\ 1 & 1 & 0.4 & 0.4 & 1 & 0.4 & 0.6 & 0.8 & 0.4 \\ 1 & 1 & 0.75 & 0.5 & 0.75 & 0.75 & 0.75 & 1 & 0.5 \\ 0.4 & 0.4 & 0.5 & 1 & 0.4 & 0.67 & 0.67 & 0.5 & 1 \\ 0.6 & 0.6 & 0.75 & 1 & 0.75 & 1 & 1 & 0.75 & 1 \\ 1 & 1 & 0.6 & 0.6 & 0.8 & 0.6 & 0.6 & 0.8 & 0.4 \end{pmatrix}$$

After that perform ranking process using the equation:

$$V_i = \sum_{j=1}^n W_j R_{ij} \dots\dots\dots[9]$$

Information:

$V_i$  = ranking for each alternative

$W_j$  = weight value of each criterion

$R_{ij}$  = value normalized performance rating

So :

$$V_1 = (20)(0.8) + (20)(0.6) + (15)(1) + (10)(1) + (15)(0.4) + (10)(0.6) + (10)(1) \\ = 16 + 12 + 15 + 10 + 6 + 6 + 10 \\ = 75$$

$$V_2 = (20)(0.8) + (20)(0.8) + (15)(1) + (10)(1) + (15)(0.4) + (10)(0.6) + (10)(1) \\ = 16 + 16 + 15 + 10 + 6 + 6 + 10 \\ = 79$$

$$V_3 = (20)(1) + (20)(0.6) + (15)(0.4) + (10)(0.75) + (15)(0.5) + (10)(0.75) + (10)(0.6) \\ = 20 + 12 + 6 + 7.5 + 7.5 + 7.5 + 6 \\ = 66.5$$

$$V_4 = (20)(0.6) + (20)(0.8) + (15)(0.4) + (10)(0.5) + (15)(1) + (10)(1) + (10)(0.6) \\ = 12 + 16 + 6 + 5 + 15 + 10 + 6 \\ = 70$$

$$V_5 = (20)(0.8) + (20)(1) + (15)(1) + (10)(0.75) + (15)(0.4) + (10)(0.75) + (10)(0.8) \\ = 16 + 20 + 15 + 7.5 + 6 + 7.5 + 8 \\ = 80$$

$$V_6 = (20)(0.6) + (20)(0.8) + (15)(0.4) + (10)(0.75) + (15)(0.67) + (10)(1) + (10)(0.6) \\ = 12 + 16 + 6 + 7.5 + 10.05 + 10 + 6$$

$$= 67.55$$

$$\begin{aligned} V_7 &= (20)(1) + (20)(0.8) + (15)(0.6) + (10)(0.75) + (15)(0.67) + (10)(1) + (10)(0.6) \\ &= 20 + 16 + 9 + 7.5 + 10.05 + 10 + 6 \\ &= 78.55 \end{aligned}$$

$$\begin{aligned} V_8 &= (20)(1) + (20)(0.6) + (15)(0.8) + (10)(1) + (15)(0.5) + (10)(0.75) + (10)(0.8) \\ &= 20 + 12 + 12 + 10 + 7.5 + 7.5 + 8 \\ &= 77 \end{aligned}$$

$$\begin{aligned} V_9 &= (20)(0.6) + (20)(1) + (15)(0.4) + (10)(0.5) + (15)(1) + (10)(1) + (10)(0.4) \\ &= 12 + 20 + 6 + 5 + 15 + 10 + 4 \\ &= 72 \end{aligned}$$

Obtained 3 major end result rankings for the new cafe locations, namely:

1.  $V_5 = 80$  ( Pagelaran)
2.  $V_2 = 79$  ( Gadingrejo)
3.  $V_7 = 78.55$  (Adiluwih)

## 5.0 CONCLUSION

### 5.1. Conclusion

With the decision support system determines the location of the new cafe Suncafe, can be used for:

1. Decision support system built to help owners Suncafe in the establishment of a new cafe location in the district Pringsewu.
2. Application of Simple Additive weighting method (SAW) can determine the location of the new cafe Suncafe in the district Pringsewu where the best alternative to the name of the location district. Performances, with the end result Building criterion values 0.8, Total Parking 1, Accessibility 1, Security 0.75, Distance to the City Center 0.4, Price Location 0.75, 0.8 Comfort, and its final result is 80.
3. Obtained big 3 ranking final results for the new cafe locations, it is  $V_5 = 80$  (Pagelaran),  $V_2 = 79$  (Gadingrejo),  $V_7 = 78.55$  ( Adiluwih).

### 5.2. Suggestions

According to writing that has been done it is expected that the next writing to conduct research decision support system by using methods such as decision making using AHP, WP, TOPSIS, and others.

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