



Decision Support System In Sous Chef De Partie Selection Using Simple Method Additive Weighting (SAW) (Case Study: Restaurant Goela Batoe)

Iwan Setia Budi, Muhammad Syahrizal

Department of Computer Science STMIK Budi Darma, North Sumatra, Indonesia

Abstract – The SAW method is also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings on each alternative of all attributes. The SAW method requires the decision matrix normalization process (X) to a scale that can compare with all available alternative ratings.

Keywords - Decision Support System, Sous Chef De Partie, Simple Additive Weighting (SAW)

1 INTRODUCTION

A restaurant is a place or building that is commercially organized, which organizes. Good service to all guests in the form of food and drink. Restaurants are located in a hotel, office or factory, and many also stand alone outside the building. In the restaurant there are several important parts for a restaurant. One of them is the kitchen, or commonly referred to by the general public kitchen. In the kitchen section, you must have a chief cook or called a chef. Chef also has several other sections, namely exc. Chef, exc. Sous chef, sous chef de partie, and demmie chef.

From some parts of the chef in the goela batoe restaurant the position of the sous chef de partie was still empty and it made the management structure in the kitchen become unbalanced so that it had an impact on turnover in the goela batoe restaurant. To choose a sous chef de partie is not arbitrary and cannot directly receive from job vacancies. Because the rules in the kitchen must increase the position of employees in the kitchen itself. So it's exc.chef must choose from one of the coomis. Coomis is the cook who is in charge of helping Chef de partie in carrying out his tasks starting from the process of cutting, cooking, to composing it for that way the solution to the problem can use decision support methods. One of them is a decision support system with the Simple Additive Weighting (SAW) method.

2 THEORY

2.1 Decision Support System (DSS)

Decision support system (Decision Support System) is an interactive information system that provides information, modeling and manipulation of data. The system is used to help decision-making in semi-structured situations and unstructured situations where no one knows for certain how a decision should be made[1]–[3].

2.2 Simple Additive Weighting (SAW)

The SAW (Simple Additive Weighting) method is often also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of performance ratings on each alternative on all attributes [4]. The SAW method requires the decision matrix normalization process (X) to a scale that can be compared with all available alternative ratings. The formula for normalization is as follows[5]–[7]:

$$r_{ij} = \begin{cases} \frac{X_{ij}}{\text{Max } X_{ij}} & \longrightarrow \text{If } j \text{ is attribute advantage (benefit)} \\ \frac{\text{Min } X_{ij}}{X_{ij}} & \longrightarrow \text{If } j \text{ is the attribute of cost (Cost)} \end{cases}$$

Information:

R_{ij} : The value of the performance rating is normalized
X_{ij} : The attribute value that is owned by each criterion



Max X_{ij} : The biggest value of each criterion
 Min X_{ij} : The smallest value of each criterion
Benefit : If the biggest value is the best
Cost : If the smallest value is the best

Where r_{ij} is a normalized performance rating from A_i alternative *attribute* C_j ; $i=1,2,\dots,m$ and $j=1,2,\dots,n$.
 Preference values for each alternative (V_i) are given as:

$$V_i = \sum_{j=1}^n W_j \cdot r_{ij}$$

Information :

V_i : Ranking for each alternative
 w_j : Weights of each criterion
 r_{ij} : Normalized performance rating values
 A larger V_i value indicates that A_i alternative is preferred.

3 RESULT AND DISCUSSION

In the SAW method process requires criteria that will be used as material for calculation and consideration. The criteria that are the material for calculation and consideration can be seen in table 1

Table 1. Criteria

Criteria	information
C1	Creative
C2	Understand Management
C3	Speed
C4	Cost
C5	Consistent
C6	Leadership

Table 2. Creative Criteria

Creative (C1)	Fuzzy	Value
Very not creative	Very low	0-20
Not creative	Low	21-40
Creative enough	Enough	41-60
Creative	High	61-80
Very creative	Very high	81-100

Table 3. Understanding Management Criteria

Understand Management (C2)	Fuzzy	Value
Very Not Understanding Management	Very low	0-20
Not Understanding Management	Low	21-40
Simply Understanding Management	Enough	41-60
Understand Management	High	61-80
Very Understanding Management	Very high	81-100

Table 4. Speed Criteria

Speed (C3)	Fuzzy	Value
Very Not fast	Very low	0-20
Not fast	Low	21-40
Fast enough	Enough	41-60
fast	High	61-80
Very fast	Very high	81-100



Table 5. Cost Criteria

Cost (C4)	Fuzzy	Value
Really do not understand the costs	Very low	0-20
Don't understand the cost	Low	21-40
Simply understand the cost	Enough	41-60
understand costs	High	61-80
Very understanding of costs	Very high	81-100

Table 6. Consistent Criteria

Consistent (C5)	Fuzzy	Value
Very Not Consistent	Very low	0-20
Inconsistent	Low	21-40
Consistent enough	Enough	41-60
Consistent	High	61-80
Very consistent	Very high	81-100

Table 7. Leadership Criteria

Leadership (C6)	Fuzzy	Value
Very No Leadership	Very low	0-20
No leadership	Low	21-40
Enough Leadership	Enough	41-60
Leadership	High	61-80
Very Leadership	Very high	81-100

Analysis Using the SAW Method

Table 8. Match Rating of Each Alternative in Each Criteria

Alternative	Criteria					
	C1	C2	C3	C4	C5	C6
Anjaz	75	65	80	77	75	76
Yohan	85	75	80	89	78	85
Farhan	70	79	78	84	80	84
Jhoni	80	60	75	90	75	79

1. The first step

The matrix formed from the match table in this case is based on table 4.8 above

$$X = \begin{bmatrix} 75 & 65 & 80 & 77 & 75 & 76 \\ 85 & 75 & 80 & 89 & 78 & 85 \\ 70 & 79 & 78 & 84 & 80 & 84 \\ 80 & 60 & 75 & 90 & 75 & 79 \end{bmatrix}$$

Decision making provides standards, based on research results.

$$W = (0,15 \ 0,20 \ 0,10 \ 0,10 \ 0,10 \ 0,35)$$

2. Second step

Normalize the X matrix based on the following equation:

- a. Normalization for Anjaz

$$r_{11} = \frac{75}{\text{Max} \{75;85;70;80\}} = \frac{75}{85} = 0,88$$

$$r_{12} = \frac{65}{\text{Max} \{65;75;79;60\}} = \frac{65}{79} = 0,82$$



$$r_{13} \frac{80}{\text{Max } \{80;80;78;75\}} = \frac{80}{80} = 1$$

$$r_{14} \frac{77}{\text{Max } \{77;89;84;90\}} = \frac{77}{90} = 0,85$$

$$r_{15} \frac{75}{\text{Max } \{75;78;80;75\}} = \frac{75}{80} = 0,93$$

$$r_{16} \frac{76}{\text{Max } \{76;85;84;79\}} = \frac{76}{85} = 0,89$$

b. Normalization for Yohan

$$r_{21} \frac{85}{\text{Max } \{75;85;70;80\}} = \frac{85}{85} = 1$$

$$r_{22} \frac{75}{\text{Max } \{65;75;79;60\}} = \frac{75}{79} = 0,94$$

$$r_{23} \frac{80}{\text{Max } \{80;80;78;75\}} = \frac{80}{80} = 1$$

$$r_{24} \frac{89}{\text{Max } \{77;89;84;90\}} = \frac{89}{90} = 0,98$$

$$r_{25} \frac{78}{\text{Max } \{75;78;80;75\}} = \frac{78}{80} = 0,97$$

$$r_{26} \frac{85}{\text{Max } \{76;85;84;79\}} = \frac{85}{85} = 1$$

c. Normalization for Farhan

$$r_{31} \frac{70}{\text{Max } \{75;85;70;80\}} = \frac{70}{85} = 0,82$$

$$r_{32} \frac{79}{\text{Max } \{65;75;79;60\}} = \frac{79}{79} = 1$$

$$r_{33} \frac{78}{\text{Max } \{80;80;78;75\}} = \frac{78}{80} = 0,97$$

$$r_{34} \frac{84}{\text{Max } \{77;89;84;90\}} = \frac{84}{90} = 0,93$$

$$r_{35} \frac{80}{\text{Max } \{75;78;80;75\}} = \frac{80}{80} = 1$$

$$r_{36} \frac{84}{\text{Max } \{76;85;84;79\}} = \frac{84}{85} = 0,98$$

d. Normalization for Jhoni

$$r_{41} \frac{80}{\text{Max } \{75;85;70;80\}} = \frac{80}{85} = 0,94$$

$$r_{42} \frac{60}{\text{Max } \{65;75;79;60\}} = \frac{60}{79} = 0,75$$

$$r_{43} \frac{75}{\text{Max } \{80;80;78;75\}} = \frac{75}{80} = 0,93$$



$$r_{44} = \frac{90}{\text{Max } \{77;89;84;90\}} = \frac{90}{90} = 1$$

$$r_{45} = \frac{75}{\text{Max } \{75;78;80;75\}} = \frac{75}{80} = 0,93$$

$$r_{46} = \frac{79}{\text{Max } \{76;85;84;79\}} = \frac{79}{85} = 0,92$$

3. Third step

Based on the results of normalization of matrix X, the matrix R is formed as follows:

$$R = \begin{bmatrix} 0,88 & 0,82 & 1 & 0,85 & 0,93 & 0,89 \\ 1 & 0,94 & 1 & 0,98 & 0,97 & 1 \\ 0,82 & 1 & 0,97 & 0,93 & 1 & 0,98 \\ 0,94 & 0,75 & 0,93 & 1 & 0,93 & 0,92 \end{bmatrix}$$

4. Fourth step

Next will be made the multiplication preference matrix W * R and the sum of the multiplication results to determine the best alternative by ranking the largest value as follows:

$$V1 = 0,88(0,15) + 0,82(0,20) + 1(0,10) + 0,85(0,10) + 0,93(0,10) + 0,89(0,35)$$

$$= 0,13 + 0,16 + 0,10 + 0,085 + 0,093 + 0,31$$

$$= 0,87$$

$$V2 = 1(0,15) + 0,94(0,20) + 1(0,10) + 0,98(0,10) + 0,97(0,10) + 0,89(0,35)$$

$$= 0,15 + 0,18 + 0,10 + 0,098 + 0,097 + 0,35$$

$$= 0,97$$

$$V3 = 0,82(0,15) + 1(0,20) + 0,97(0,10) + 0,93(0,10) + 1(0,10) + 0,98(0,35)$$

$$= 0,12 + 0,20 + 0,097 + 0,093 + 0,10 + 0,34$$

$$= 0,95$$

$$V4 = 0,94(0,15) + 0,75(0,20) + 0,93(0,10) + 1(0,10) + 0,93(0,10) + 0,89(0,35)$$

$$= 0,14 + 0,15 + 0,93 + 0,10 + 0,093 + 0,32$$

$$= 0,89$$

Table 9. Case Settlement

Alternative	Criteria						Alternative Value
	C1	C2	C3	C4	C5	C6	
Anjaz	75	65	80	77	75	76	0,87
Yohan	85	84	80	89	78	85	0,97
Farhan	70	79	78	84	80	84	0,95
Jhoni	80	60	75	90	75	79	0,89

From the results of the calculation of preferences above obtained alternative values 1, 2, 3, and 4, respectively 0.87; 0.97; 0.95; 0.89 so that the best alternative is available and able to occupy a position *sous chef de partie* is Yohan

4 CONCLUSION

From the results of the discussion of the problems described in the previous chapter it can be concluded as follows:



1. Criteria that can refer to the ability of a sous chef de partie are creative, understand management, speed, cost, consistency, leadership. The value weights for each criterion are creative (0.15), understanding management (0.20), speed (0.10), cost (0.10), consistent (0.10), leadership (0.35) .
2. In the application of the SAW method, calculation of each of the criteria owned by each coomis is carried out through several stages such as creating an x matrix, normalizing, creating a normalized matrix, and making preference calculations to obtain the most maximum and accurate results.
3. Designing a decision support system in the selection of sous chef de partie is designed using visual basic 2008 programming language and MySQL database as a place to store data that will be processed and consists of several views namely, login, main menu, input criteria weighting each alternative, process , decisions, about me, and going out.

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