



# MOBILE WEB IMPLEMENTATION OF DETERMINING PERFORMING EMPLOYEES IN REGENCY HOTELS BY WEIGHTING THE SIMPLE ADDITIVE WEIGHTING METHOD

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**Verawati**

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## Abstract

Regency Hotel is a hotel located in Gadingrejo sub-district of Pringsewu Regency which has many employees. There are Dozens of Employees who work at Regency Hotels. Regency Hotel Management requires a System to find the best employees who are entitled to get rewards. need a system to determine the best employees. To avoid subjectivity, for this reason a system with accurate and precise calculation methods is needed. Here the author will design a decision support system to determine the best employees at the Regency hotel using the SAW method. The SAW method is a method used for a decision support system based on the required criteria. With this system, the best employee selection at Regency hotels is very precise and accurate without any subjectivity.

## 1.0 INTRODUCTION

The development of technology is developing very rapidly, at this time all fields require technology both education, health, agriculture and the economy. Regency Hotel is a hotel located in Gadingrejo District, Pringsewu Regency which has implemented many technologies such as the use of CCTV, the use of a guest reservation system and so on. However, Regency Hotel management has problems in providing rewards for employees who are sometimes still subjective.

Related research previously conducted The Best Employee Selection Decision Support System Using Weighted Product Approach (Case Study: PT. Telkom Cab. Lampung), The results of the research prove that this application is able to assist companies in the selection process selection of the best employees with the weighted product method, as well as providing the best employee information effectively and efficiently[1]. Related research was also previously carried out, which is a Decision Support System for Determining Contract Employees to Become Permanent Employees Using the Topsis Method. The results of this study build a decision support system using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method for calculating the results in determining contract employees to become permanent employees[2].

Slightly Different from the two researchers above here the writer will make a Decision Support System Determining the Best Employees at Regency Hotel web based using the SAW method. With this decision support system, it makes hotel management easier determine the best employee and can avoid subjectivity. How to make a Decision Support System Determining the Best Employees at Regency Hotel web-based using the SAW method to help produce decisions that are accurate, fast, and precise in terms of determining the recipient of the Reward.

## 2.0 RESEARCH METHOD

### 2.1 Simple Additive Weighting Method

The Simple Additive Weighting (SAW) method is often also known as the method weighted addition. The basic concept of the Simple Additive Weighting (SAW) method is to find the weighted sum of the performance ratings for each alternative on all attributes. The Simple Additive Weighting (SAW) method requires a normalized process of decision matrix (X)[3][4][5][6].

$$r_{ij} = \frac{x_{ij}}{\text{Max}(x_{ij})}$$

$$r_{ij} = \frac{\text{Min}(x_{ij})}{x_{ij}}$$

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

Where :

$r_{ij}$  = normalized work rating.

$\text{max}_i$  = maximum value of each row and column.

$\text{mini}$  = the maximum value of each row and column.

*minimum = minimum value of each row and column. X = row and column of the matrix. (rij) is the normalized performance rating of alternative (Ai) on attributes (Cj) i= 1,2,...,m and j=1,2,...,n.*

A greater value of  $V_i$  indicates that the alternative  $A_i$  is preferred.

Where :

$V_i$  = the final value of the alternative.

$W_i$  = weight that has been determined.

$r_{ij}$  = matrix normalization A greater value indicates that more chosen alternative.

There are several steps in completing the Simple Additive Weighting (SAW) method. Which is applied as follows[7], [8]:

1. Determine the criteria used reference in decision support, namely  $C_i$ .
2. Determine each match rating alternative to each criteria.
3. Make a decision based matrix criteria ( $C_i$ ).
4. Then normalize the matrix based on adjusted equality by type attribute (profit attribute or cost attribute) so that it is obtained normalized matrix R.
5. The final result is obtained from the process Ranking is the sum of normalized matrix multiplication R with weight vector so that the greatest value is obtained chosen as the best alternative ( $A_i$ ) as a solution.

### 2.2 Information Systems development methods

SDLC (System Development Life Cycle), System Development Life Cycle is the process of making and changing systems as well as models and methodologies used to develop software

systems, which consist of the Planning, Analysis, Design, Implementation, Operation and Management.

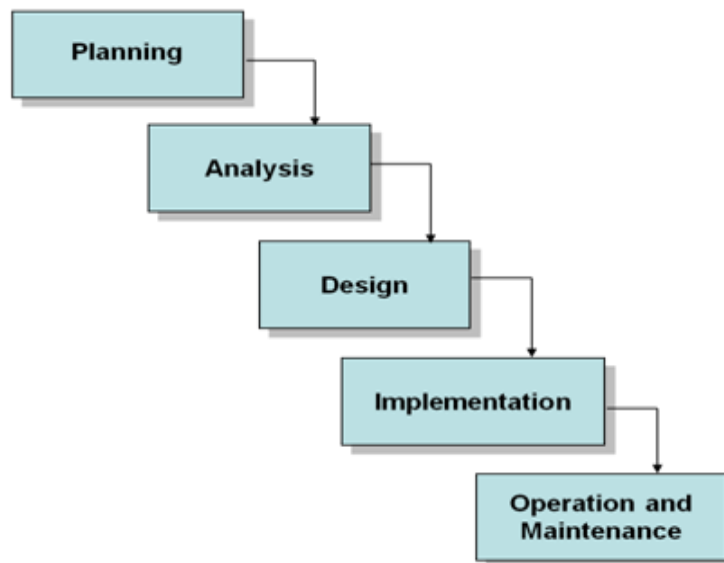


Figure 1. Stages SDLC[9][10], [11]

### **Planning Phase**

This stage aims to identify and prioritize what information systems will be developed, what goals to be achieved, the duration of implementation and, consider the available funds and who is implementing them. Some of the advantages of computer-based SI planning, are:

1. Improve communication between managers, users and makers.
2. Increasing the effective use of organizational resources.
3. Support communication for accountability activities carried out by individuals and departments.
4. Support the evaluation process.
5. Enables managers to manage long-term system development.

### **System Design Stage**

System analysis is used to answer the question what? The system design is used to answer the question how? Design concentrates on how the system is built to meet the needs of the analysis phase. The benefits of system design is to provide a complete design picture (Blue Print), as a guide (guideline) for programmers in making applications. The computerized information system consists of:

1. Hardware: consists of input, process, output, and network components.
2. Software: consists of information systems, utilities, and applications.
3. Data: includes data structure, data security and integrity.
4. Procedures: such as documentation, system procedures, operational and technical manuals.
5. Humans: those involved in the use of information systems.

### **Making a System (Building)**

An information system / application creation based on a design that has been created. In addition, make a manual to use an information system / application so that it is easy when conducting training at the time of implementation. The information system / application testing process, Performance testing, Testing the logic / syntax program, Testing the implementation of business rules, Testing human factors, Testing business processes / procedures, Testing input efficiency, Testing output. [7] [8] [9]

### **System Implementation**

Namely implementing a system that has been made. Before implementation, prepare carefully for hardware, software, rooms and other supporting facilities. Some things that are also important to consider in implementing the system are:

1. Conversion  
Usually it takes conversion from the old system to the new system, especially if you have used computerized applications before.
2. Training  
Conduct comprehensive training for each party that uses. And do not forget to socialize to the parties involved in the system but do not use the system application directly.
3. Testing acceptance  
Perform testing for a certain period as a learning process.

### System Maintenance

Stages of system maintenance covers all processes needed to ensure continuity, smoothness, and improvement of the system that has been operated. Some things to do:

1. Operational monitoring  
Involve the development team to monitor directly at certain times about how the parties operate the system created.
2. Anticipate small bugs (bugs)  
Usually there is a small disturbance in a newly developed application.
3. Make improvements.
4. Anticipate outside factors  
Viruses, data damage / data loss, or systems accessed by outsiders. [6]

### 3.0 RESULT

The SAW method requires the decision maker to determine the weight of each attribute. The total score for the alternative is obtained by adding up all the multiplication results between the rating (which can be compared across attributes) and the weight of each attribute. The rating of each attribute must be dimension free in the sense that it has passed the previous matrix normalization process. The completion steps in the SAW method are as follows:

Determine the criteria that will be used as a reference in making decisions, namely  $C_i$ .

Table 1 Criteria & Alternative

No	Criteria	Type	Weight	Alternative
1	Presence	Benefit	0.1	A1
2	Target	Benefit	0.25	A2
3	Years of service	Benefit	0.3	A3
4	Social	Benefit	0.2	A4
5	Professional	Benefit	0.15	A5
<b>Amount</b>			1	

Table 2 Permission assessment preferences

No	Presence	Mark
1	Keep Present	4
2	1-2 Days absent	3
3	3-4Days absent	2
4	5-6 Days absent	1
5	> 1 week absent	0

Table 3 Attendance assessment preferences

No	Presence	Value
1	Exceeding the target	4
2	On target	3
3	Approaching the target	2
4	Less than target	1
5	Far below the target	0

Table 4 Appraisal Preferences

No	Years of service	Value
1	> 4 Year	4
2	>3 Year	3
3	>2 Year	2
4	>1 Year	1
5	<1 Year	0

Table 5 Social assessment preferences

No	Social	Value
1	Very good	4
2	good	3
3	enough	2
4	Bad	1
5	Very bad	0

Table 6 Professional preferences

No	Professional	value
1	Very good	4
2	Good	3
3	Enough	2
4	Bad	1
5	Very bad	0

Determine the suitability rating of each alternative for each criterion.

Table 7 Compatibility rating

Alternative	Criteria				
	C1	C2	C3	C4	C5
A1	3	4	3	4	3
A2	4	2	2	4	4
A3	4	3	4	4	4
A4	4	2	2	2	4
A5	4	2	2	3	4

Normalisation matrix

**A1**

$$R_{11} = \frac{3}{\text{Max}\{3,4,4,4,4\}} = \frac{3}{4} = 0.75$$

$$R_{12} = \frac{4}{\text{Max}\{4,2,3,2,2\}} = \frac{4}{4} = 1$$

$$R_{13} = \frac{3}{\text{Max}\{3,2,4,2,2\}} = \frac{3}{4} = 0.75$$

$$R_{14} = \frac{4}{\text{Max}\{4,4,4,2,3\}} = \frac{4}{4} = 1$$

$$R_{15} = \frac{3}{\text{Max}\{3,4,4,4,4\}} = \frac{3}{4} = 0.75$$

**A2**

$$R_{21} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

$$R_{22} = \frac{2}{\text{Max}\{4,2,3,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{23} = \frac{2}{\text{Max}\{3,2,4,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{24} = \frac{4}{\text{Max}\{4,4,4,2,3\}} = \frac{4}{4} = 1$$

$$R_{25} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

### A3

$$R_{31} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

$$R_{32} = \frac{3}{\text{Max}\{4,2,3,2,2\}} = \frac{3}{4} = 0.75$$

$$R_{33} = \frac{4}{\text{Max}\{3,2,4,2,2\}} = \frac{4}{4} = 1$$

$$R_{34} = \frac{4}{\text{Max}\{4,4,4,2,3\}} = \frac{4}{4} = 1$$

$$R_{35} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

### A4

$$R_{41} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

$$R_{42} = \frac{2}{\text{Max}\{4,2,3,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{43} = \frac{2}{\text{Max}\{3,2,4,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{44} = \frac{2}{\text{Max}\{4,4,4,2,3\}} = \frac{2}{4} = 0.5$$

$$R_{45} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

### A5

$$R_{41} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

$$R_{42} = \frac{2}{\text{Max}\{4,2,3,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{43} = \frac{2}{\text{Max}\{3,2,4,2,2\}} = \frac{2}{4} = 0.5$$

$$R_{44} = \frac{3}{\text{Max}\{4,4,4,2,3\}} = \frac{3}{4} = 0.75$$

$$R_{45} = \frac{4}{\text{Max}\{3,4,4,4,4\}} = \frac{4}{4} = 1$$

Table 8 Normalization

Alternative	Criteria				
	C1	C2	C3	C4	C5
A1	0.75	1	0.75	1	0.75
A2	1	0.5	0.5	1	1
A3	1	0,75	1	1	1
A4	1	0.5	0.5	0.5	1
A5	1	0,5	0.5	0.75	1

Table 9 Results and Rank

Alternative	Criteria					Results	Rank
	C1	C2	C3	C4	C5		
A1	0.075	0.25	0.225	0.2	0,112	0.8625	2
A2	0.1	0.125	0.15	0.2	0,15	0.775	3
A3	0.1	0.187	0.3	0.2	0,15	0.937	1
A4	0.1	0.125	0.15	0.1	0,15	0.625	5
A5	0.1	0.125	0.15	0.15	0,15	0.675	4

### Context Diagram

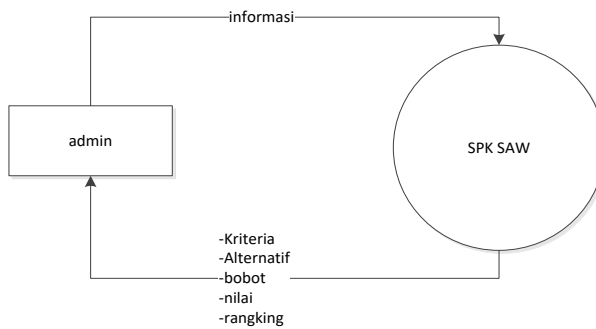


Figure 2 Context Diagram

#### a. Login page

Before entering the system we must log in first. after logging in we input the criteria for the best employee rating, there is an add, edit and delete menu.

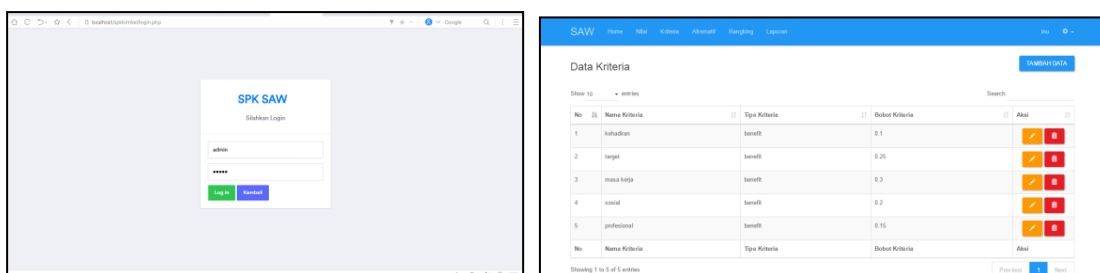


Figure 3 Login and Criteria

#### b. Alternative page

We enter the alternative, the names of hotel employees, there is an add edit and delete menu.

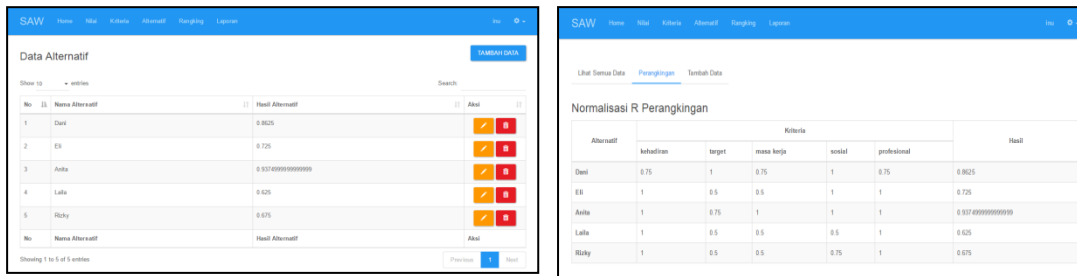


Figure 4 Alternative and Ranking

The report page is used to print the SAW calculation report

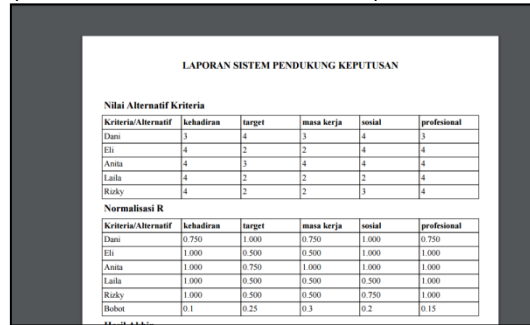


Figure 5 report

#### 4.0. CONCLUSIONS

Based on the results of research conducted by the author regarding the Decision Support System to determine the recipient of the 5. Best Employee award recipients at regular hotels using the Simple Additive Weighting (SAW) method, the author can draw the following conclusions, with this system provides convenience to hotel management to get accurate results. In implementing the method Simple Additive Weighting (SAW) can be applied very well especially in determining the award recipients of hotel regency employees. Decision support systems to be useful Determine the award recipient the best web-based hotel regency employees by using the SAW method works very well.

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