

# Boarding House Selection using SAW Method

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**Abstract:** Determination of residence in a new area known is influenced by many factors namely location, facilities, contract systems and prices. This journal determines the criteria used in selecting a residence. These criteria were analyzed using simple additive weighting (SAW) method. The results of the analysis obtained in the form of location criteria to determine the most suitable boarding house because the existence of boarding houses in the vicinity of public facilities is highly expected for migrants in a new area. With the advancement of information technology it can answer the need to find a boarding house, and will be very helpful both from the owner and tenant side. And not only that, with this internet technology, prospective tenants can also select a boarding house that suits their wishes. Planning a system that can assist in the determination of temporary housing is needed by tenants in finding housing that fits the desired criteria. With the creation of a DSS (Decision Support System), the selection of boarding houses is expected to help resolve the problem of alternative housing. Therefore a decision support system application program is needed to determine a temporary residence or boarding house. Decision support system is a computer-based system that aims to assist decision making by utilizing data and models to solve unstructured problems.

**Index Terms:** Location, analysis criteria, decision support system, Simple Additive Weighting

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## I. INTRODUCTION

### A. Background

The issue of decision making is basically a form of selection of various alternative actions that may be selected which process through a certain mechanism, with the desire that it will produce the best decisions such as the existence of a less accurate boarding house that becomes difficult at the beginning for new arrivals [1-5]. With the existence of internet technology, it allows the owners of boarding houses to promote their boarding houses through this medium at a relatively cheap cost [6-10] and can be seen directly by prospective tenants using the Simple Additive Weighting (SAW) method on a decision support system that is one way of solving problems, where consumers will feel helped by the existence of this system by providing recommendations or suggestions for boarding places that are in accordance with consumer criteria by inputting criteria on the system by users [11][12]. So that at the end of the process users will get a list of recommended boarding house based on their input criteria. The results showed that this boarding house search system can help prospective boarding tenants to get alternative boarding places that can be recommended based on the selected criteria.

### B. Problem Formulation

Based on background above it can be formulated problem to be solved, it was how to design a decision support system using Simple Additive Weighting (SAW) to determine boarding house selection criteria.

### C. Problem Limitation

1. Research was conducted in boarding house around Pringsewu market.
2. This application system is built to make decision in selecting boarding house around Pringsewu market.
3. Decision making system was made only to give boarding house alternative rent with the number of options is five boarding houses
4. This decision support system was made by using PHP and MySQL programming language as database.

**D. Research Objective**

To produce decision support system to determine boarding house using Simple Additive Weighting (SAW).

**II. LITERATURE REVIEW**

**A. System**

The system is a network of interconnected procedures collect together to carry out an activity for a particular purpose [13-16]. The system in general is a collection of elements that interact with each other to achieve a goal [17-20].

**B. Information**

Data and information is a foundation in understanding information system [21-24]. Information is processed data and meaningful data [25-28].

**C. Information System**

Information is a computerized system for processing data entered into information or data, storing, distributing and producing new information to complete a task automatically or as a supporter of human resources in carrying out the functions of corporate operations, controlling and returning decisions within an organization [29-32]. Information is a group of interconnected component and functions to collect, process and provide output in the form of information needed to finish business duties [33-36].

**D. Boarding house definition**

Boarding house (bahasa: kost) is a service that offers a room or place to live in with a certain amount of payment for each particular period (generally costs). The word "kost" is actually a derivative of the Dutch phrase "Indekost". "But if the phrase is further elaborated can also mean "stay and eat" inside the house. Often the time goes on and age changes, now the public in Indonesia calls the term "indekost" by abbreviating it as "kost" only This boarding service is not free, that is with certain payments for each period, usually calculated monthly.

**E. Simple Additive Weighting (SAW)**

SAW Method is looking for a weighted addition from the performance rating on each alternative on all attributes. SAW Method Required a normalization process decision matrix (X) to a scale which can be compared with all available alternative ratings

**III. RESEARCH METHOD**

**A. Observastion**

Observation in the context of scientific research is a study that is endured and carried out systematically, planned and directed at a goal by observing and recording the phenomenon or behavior of a group of people in context in daily life and pay attention to daily life and show scientific research

requirements [37-40]. Thus the results can be accounted for the truth.

**B. Literature Research Method**

Library method is data collection techniques by learning references in the form of documents / files and data collection, legislation, books, research journals, etc., through library research was reviewed the laws and regulations related to the management of regional potential. Need of data revealed about indicators used by investors for decision making investment was obtained through library research towards research books and journals. Library study was also conducted to know technology capabilities information that will be applied in system.

**IV. DESIGN AND IMPLEMENTATION**

Several things that can be described are as follows

**A. Design**

This performance assessment of decision support system was used to determine the performance of the selection of boarding house. The stage of making this application, first, determine and plan the criteria in determining the boarding house, namely costs, distance, facilities, and room area.

**a. Weight**

In this research there were weight and criteria needed to determine boarding house selection.

Table 1. Criteria code.

Criteria code	Description
C1	Cost
C2	Distance
C3	Facility
C4	Room size

From the criteria, it can be determined the importance level of criteria based on weight score determined in fuzzy number. Suitability rating of each alternative of each criterion is as follows: table 2 shows location criteria, table 3 shows cost criteria, table 4 shows distance criteria, table 5 shows facility criteria, table 6 shows room size criteria.

Table 2. Location criteria

Location criteria	Score
Close to market (DP)	1
Close to road (DJR)	2
Close to worship place (DTP)	3
Close to restaurant (DRM)	4
Close to entertainment area (DTH)	5

Table 3. Cost criteria

Cost	Score
≥ 700,000	1
>700,000<400,000	2
>400,000<350,000	3
>350,000<300,000	4
≤300,000	5

Table 4. Distance criteria

Distance	Score
≥ 1 km	1
>1 km <700 m	2
>700 m <350 m	3
>350 m ≤50 m	4
≤50 m	5

Table 5. Facility criteria

Facility	Score
mattress	1
mattress, wardrobe	2
mattress, wardrobe, table	3
mattress, wardrobe, table, fan	4
mattress, wardrobe, table, fan, TV	5

Table 6. Room size criteria

Room size	Score
3x4 m2	1
4x5 m2	2
5x6 m2	3
6x7 m2	4
7x8 m2	5

**b. System Design**

Figure 1 shows DFD Level 1.

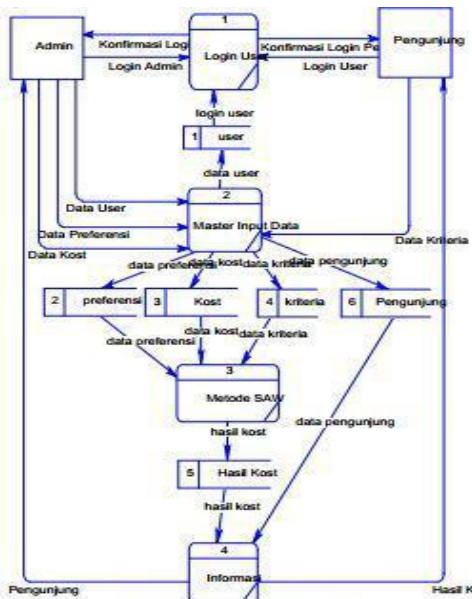


Figure 1. DFD Level 1

(admin- login confirmation - admin login - user login - visitor- user data - boarding house data - preference data - preference - boarding house - criteria - visitor - SAW method- boarding result-information)

At the figure 1. It can be known the outside entity involved was admin and visitor

a) Admin

Admin had some duties to input user data, cost data, criteria data and preference. Besides that admin can insert, update, delete each data form input.

1. As data manager with full access right
2. Having access right to insert, update, delete user data.
3. Having access right to insert, update and delete cost data.
4. Having access right to insert, update, and delete preference data.
5. Having access right to insert, update criteria data.
6. Viewing visitor data.

b) Visitor

Visitor selected boarding house based on input criteria

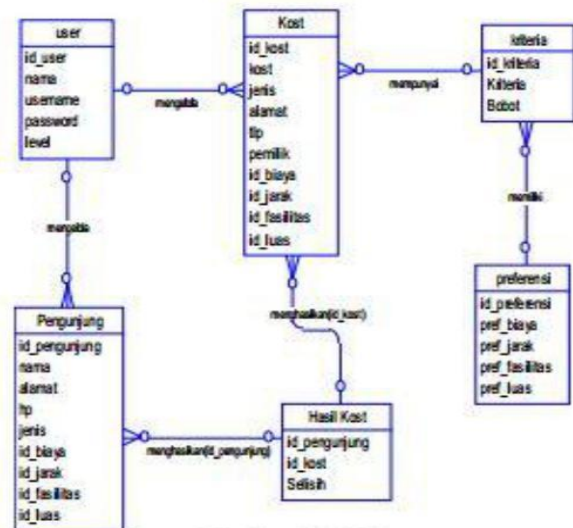


Figure 2. ERD

Figure 2 shows Entity Relationship Diagram (ERD). ERD from Decision Support System of Boarding House selection consisted of 6 tables namely user table, boarding house table, visitor table, boarding house result table, preference table and criteria table, the table is related each other.

**B. Implementation**

In this research, it would be an example of calculation in looking for boarding house from 3 boarding houses and 1 visitor. Decision making gave preference weight as follows :  $W = (4,3,2,2)$ . Table 7 shows preference weight.

Table 7. Preference weight



Alternative	Criteria			
	C1	C2	C3	C4
Cost1	5	5	3	2
Cost2	4	4	2	2
Cost3	5	5	3	1

Decision matrix formed was as follows :

$$X_{Kos} = \begin{pmatrix} 5 & 5 & 3 & 2 \\ 4 & 4 & 2 & 2 \\ 5 & 5 & 3 & 1 \end{pmatrix}$$

Matrix Normalization

Cost 1 (K1):

$$R11 = \text{Min}\{5,4,5\}/5 = 4/5 = 0.8$$

$$R12 = \text{Min}\{5,4,5\}/5 = 4/5 = 0.8$$

$$R13 = 3/\text{Max}\{3,2,3\} = 3/3 = 1$$

$$R14 = 2/\text{Max}\{2,2,1\} = 2/2 = 1$$

Cost 2 (K2):

$$R21 = \text{Min}\{5,4,5\}/4 = 4/4 = 1$$

$$R22 = \text{Min}\{5,4,5\}/4 = 4/4 = 1$$

$$R23 = 2/\text{Max}\{3,2,3\} = 2/3 = 0.67$$

$$R24 = 2/\text{Max}\{2,2,1\} = 2/2 = 1$$

Cost 3 (K3)

$$R31 = \text{Min}\{5,4,5\}/5 = 4/5 = 0.8$$

$$R32 = \text{Min}\{5,4,5\}/5 = 4/5 = 0.8$$

$$R33 = 3/\text{Max}\{3,2,3\} = 3/3 = 1$$

$$R34 = 1/\text{Max}\{2,2,1\} = 1/2 = 0.5$$

Normalization of R matrix was obtained from normalization of X matrix as follows :

$$R_{Kost} = \begin{bmatrix} 0,8 & 0,8 & 1 & 1 \\ 1 & 1 & 0,67 & 1 \\ 0,8 & 0,8 & 1 & 0,5 \end{bmatrix}$$

Then it will be made multiplication of  $W \cdot R$  and addition of multiplication result to obtain best alternative by performing greatest score ranking as follows :

$$V_{cost1} = (0.8 \cdot 4) + (0.8 \cdot 3) + (1 \cdot 2) + (1 \cdot 2) = 9.6$$

$$V_{cost2} = (1 \cdot 4) + (1 \cdot 3) + (0,67 \cdot 2) + (1 \cdot 2) = 10.3$$

$$V_{cost3} = (0.8 \cdot 4) + (0.8 \cdot 3) + (1 \cdot 2) + (0,5 \cdot 2) = 8.6$$

Thus alternative (cost 1) was selected alternative as alternative cost that suitable with criteria.

## V. CONCLUSION AND SUGGESTION

### A. Conclusion

Concept of decision support system design of housing or boarding house is expected to be a reference for further development. From various boarding houses exist in Pringsewu, it is expected to help tenant in determining decent boarding house in accordance with desire from tenant.

### B. Suggestion

To improve performance and complete decision support system made, author gives some suggestion as follows :

1. Because of time limitation, author only limited 4 scores of each criterion, namely cost, distance, facility and room size. For system development can be added other variable scores that is possible to reinforce in decision making.
2. Web-based system becomes the true development system to make the application can be accessed everywhere.

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