Decision Support System in Employee Admissions Using Simple Additive Weighting Algorithm at CV.Sumber Solusi Bersama

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**ABSTRACT**

Keywords: Decision Support System, Employee Admission, SAW.

This research aims to design and implement a decision support system (SPK) in the employee admission process at CV. Sumber Solusi Bersama using the Simple Additive Weighting (SAW) algorithm. CV. Sumber Solusi Bersama faces the challenge of selecting the best candidates from several qualified applicants based on various criteria, such as education, work experience, skills, and interviews. The SAW method was chosen because of its ability to provide an objective and measurable assessment based on the weight given to each criterion. This study uses a quantitative approach by collecting qualitative data from the recruitment process in CV. Furthermore, calculations are carried out using the SAW algorithm to determine the total score of each applicant.

**Introduction**

The employee recruitment and selection process is one of the critical aspects of human resource management in every organization (Yunita, Wibowo, Rizky, & Wardah, 2023). The selection of the right candidate affects operational performance and contributes to the achievement of the company's strategic goals. CV. Sumber Solusi Bersama, as a growing company, faces the challenge of screening many applicants to find individuals who best suit the needs and culture of the organization (Gunawan, Ariany, & Novriyadi, 2023). The manual selection process is often time-consuming and susceptible to subjectivity, so a method is needed to increase efficiency and accuracy in decision-making (Purnama, Putra, Adi, & Hartanti, 2022).

Decision Support Systems (Decision Support Systems) can help managers make better and more accurate decisions based on data and analytical models. In employee admission, SPK can be used to evaluate and compare prospective employees based on various relevant criteria (Setiawansyah & Saputra, 2023). One effective method for applying SPK is the Simple Additive Weighting (SAW) algorithm. The SAW algorithm is known for its simplicity and ability to process multi-criteria data by assigning weight to each criterion according to its level of importance. A decision support system is
generally defined as one that can provide problem-solving skills and communication
skills for semi-structured problems (Rahayu, Hamdani, & Ramadiani, 2022).

This research aims to design and implement SPK in accepting employees at CV.
Sumber Solusi Bersama using the SAW algorithm (Anita, Wahyudi, & Susanto, 2020).
This study will also evaluate the effectiveness of implementing the SAW algorithm in the
context of employee selection and identify the benefits and challenges faced in its
implementation (Apriliawati, 2020).

The determination of the decision support system using a simple additive weighting
algorithm on a CV. Sumber Solusi Bersama makes the employee admission selection
process an alternative way of selection where the director can make an employee
admission decision using the existing system (Ulama, Priandika, & Ariany, 2022).

Method

In this study, the author uses a data collection method through two approaches:
literature study and field study. Literature studies involve searching documents, book
references, and journals related to the research topic, which have been previously
conducted by other researchers, to provide a basis for reference in this research. As for
field studies, data were collected through interviews and observations. Interviews are
conducted by asking users directly to obtain information about criteria and alternatives
relevant to the research. Meanwhile, observation was carried out by visiting the location
per the alternatives agreed upon in the previous interview.

Planning

The planning stage is an important initial stage in designing a system. At this stage,
an initial analysis of the needs of the necessary devices is carried out when the system is
planned and executed.

Data Collection

The Data Collection stage refers to the process of collecting information that will
be used in creating a system. This collection is carried out through the application of
various methods, as will be explained below:

Interview
The interview approach is one technique used to collect data by asking and answering questions. This approach is considered the first step in the development of information systems. Interviews were conducted with parties related to the system.

**Survey**

Field survey methods aim to collect information regarding the physical condition of the relevant location. The data generated from this survey will then be analyzed to adapt the system to the actual field conditions. In addition, field survey techniques can also be applied when the system is in the trial stage to evaluate whether it is by field conditions.

**Observation**

The observation approach is one technique for collecting data by observing existing data systems. This approach aims to obtain information related to the ongoing data flow.

**System Design**

The next step is to design the system to be developed. This process includes designing databases, interfaces, and system feasibility when implemented. This stage consists of several steps, as explained below.

**System Flow Planning**

The planning process for making a payment system in CV. The source of the joint solution consists of the flow of the decision support system in the acceptance of employees to the ranking of this system, which will be presented below.

**Decision Support System Flow**

![Figure 2 Drawing of the Flow of the Decision Making System](image)

The decision support system process starts from the admin login and then continues by adding employee data, including name, birthplace, skills, and experience. After that,
the TPA master data is entered, including name, skills, experience, certification, and attitude. Furthermore, the criteria data and their weights are included in the criteria master data. This process then proceeds to the processing page, where the input data is processed to produce data normalization, decision-making, and ranking.

**Database Design**

Database design is creating a design that supports the company's operations and goals. Databases allow for quick and easy storage, alteration, and retrieval of data.

**Interface Design**

The interface design aims to create an attractive and user-friendly display. This process involves creating a simple sketch of the display to be developed.

**System Trial**

System testing is the stage where the software that has been developed is tested to assess its feasibility. This stage is crucial to determining whether the system being developed meets the expected standards. The relevant technical units carry out these tests and provide recommendations and inputs based on the test results.

**Implementation**

Implementation is the final stage after the developed system meets all the requirements. At this stage, the software is ready to use. Further system development will be carried out after the application passes the due diligence test and is implemented.

In this study, the authors applied a data processing method known as Simple Additive Weighting (SAW), which uses weighted summation. This SAW method recommends selecting culinary attractions based on the assessment of weighted values on relevant attributes. SAW has an easy-to-understand and simple concept and can compare the relative performance of available alternatives. This method's basis is to sum each alternative's performance values on all weighted attributes. The SAW process requires normalizing the decision matrix to compare alternative ratings. One of the main
advantages of SAW is its ability to provide a more accurate assessment based on the value of predetermined criteria and the weight of preferences, as well as its ability to choose the best alternative through the ranking process. However, the main drawback of SAW lies in the normalization process, which does not always reflect the actual value. The criteria in SAW are divided into two types, namely the cost criterion and the benefit criterion, each of which has a different influence on the weight of the criteria given. The SAW implementation process consists of certain steps that will be outlined as follows:

a. Determining alternatives \( A = \{A_1, A_2, A_3, \ldots, A_i\} \)
b. Determine the criteria to be used as a benchmark in decision-making \( C = \{C_1, C_2, C_3, \ldots, C_j\} \)
c. Determines the match rating on each alternative for each criterion.
d. Determine each criterion's preference weight value or importance level \( W \). \( W = \{W_1, W_2, W_3, \ldots, W_j\} \)
e. Create a decision matrix based on criteria \( (C_j) \), then normalize the matrix based on an equation that is adjusted to the type of a attribute (benefit attribute or cost attribute) so that a normalized matrix \( r_{ij} \)

\[
\frac{x_{ij}}{\min x_{ij}} \text{ jika } (j) \text{ is a benefit attribute and } \frac{\text{numerator}}{\max x_{ij}} \text{ jika } (j) \text{ is a cost attribute (here } r_{ij} \text{ is}
\]

the numbered performance rating of all AI alternatives on each attribute \( C_i \); \( i=1,2,3,\ldots,m \) and \( j=1,2,3,\ldots,m \). The alternate preference value \( (V_i) \) is given as:

\[
V_i = \sum_{j=1}^{c} w_j r_{ij}
\]

A \( V \) value higher than the other values indicates that the \( A_i \) alternative is the best.

The detailed explanation related to the formula is as follows:

- \( A_i \): Alternative
- \( C_j \): Criterion
- \( W_j \): Bobot Kriterria
- \( r_{ij} \): Normalized performance ratings
- \( X_{ij} \): Each row and column of the matrix
- \( \text{Min } X_{ij} \): Minimum value for each row and column
- \( \text{Max } X_{ij} \): Maximum value in each row and column
- \( V_i \): Ranking on each option

**Results and Discussion**

Decision-Making System for Accepting CV Staff. Sumber Solusi Bersama is implemented as a website-based system managed by CV. Shared Solution Sourcing. The results of the production are presented in the following figure:

**Main View of Decision Support System**
On this decision support system's login page, input fields for usernames and passwords are displayed for administrators, allowing them to access and manage data.

**Prospective Employee Page View**

On the prospective employee master data page, HRD inputs data on prospective employees, including names, photos of applications, places, and dates of birth, skills, and experience (Abidin, 2020). The CV director also can edit the information that has been entered.
Figure 6 Tpa Master Data Display

On the TPA master data page, CV directors enter scores for each assessment column, including skills, experience, certifications, interviews, and attitudes for each prospective employee assessed directly by the CV director.

Master Data Setting Page View

Figure 7 Display of the Setting Data Page

On this page, the CV director directly enters the value weights for each assessment indicator. This weight will be used to evaluate each prospective officer's ranking.

SPK Process Page View
On this page, the grades and names of prospective employees entered by the CV director will be automatically displayed along with the grades given (Dameria & Nursyanti, 2022). These values will be processed based on the weights determined by the CV director. By pressing the process button, normalization values, determination values, and rankings will be generated to determine employees based on the ranking of predetermined values.

**Conclusion**

From the discussion and explanation presented previously, the following conclusions can be drawn: 1. The system facilitates the CV director in determining employees who will be accepted based on the values and weights set; 2. This system supports the accurate and efficient selection of prospective employees; 3. The system contributes to CVs. Sumber Sumber Solusi Bersama in managing data and weight values to assess prospective employees who will be accepted.
Bibliography


