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Comparative Analysis of the Combination of AHP-SAW and AHP-WP In Making Decisions on Hiring New Employees

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Abstract

This paper's web-based employee recruitment the goal is to help Human Resource Development (HRD) managers automatically calculate criterion weights and alternative weights, refinement of potential employees and a faster selection process. Recommendation system applications use Combination of Simple Additive Weighting (SAW) and Analytic Hierarchy Process (AHP). The AHP method determines the importance of each professional criterion is at the moment. SAW, on the other hand, determines the position or priority of a potential employee, calculated from alternative options. In the AHP method, criteria influence the outcome of a decision. The resulting calculations are examined using the specified priority weights to see which criteria are most important. The weight value for the CI criterion was 0.0603, and the CR value was 0.0538. However, a sensitivity analysis of criterion priorities is required to examine the extent to which small effects on criterion weights change the ranking of alternatives. Based on the ranking results using AHP-WP, Fajar ranked first with a preference value of 0.1037289. You can also see how important the selection criteria are to the ranking results.

Keyword: Analytic Hirarchy Process, Criteria Weight, Simple Additive Weighting, Weighted Product, Sensitivity Test

1. INTRODUCTION

How a company survives and makes more money is closely related to the nature and working principles of its human resources. Employee performance increases along with the company's progress [1]. In the current development of science and information technology and in conditions of increasingly tight competition , every company is always trying to improve and develop its business. Companies that want to grow must look for employees who are confident they can meet the company's needs. Employees are one of the most important assets of any company. Getting employees who are competitive and able to adapt to the company's interests requires a relatively long process [2].

Many companies or agencies have difficulty selecting employees who are experts in their fields to meet their needs [1]. When hiring new employees, new employees often have a short onboarding period. The main problem is the wrong selection of employees. You take on an employee, and after a while you discover that the employee doesn't have the qualifications listed in the job description [3]. There is a recruitment process that still does not meet the company's criteria, so the company experiences problems in placing its employees, This is because some employees do not meet the required standards and qualifications [4]. The above problem is caused by her HRD's lack of systematic and validated criteria to assess whether a potential employee is valuable [2].

Human Resource Development (HRD) GSI CCTV Semarang continues to use manual processes when recruiting potential new employees. The evaluation process is based on the personal opinion of the HRD manager by analyzing the criteria forms available to potential employees directly at the application stand send.

Due to the large number of new applicants, the human resources department cannot directly analyze the criteria of the candidates in the application folder. Additionally, if done manually by HRD personnel, there is a risk of inconsistent prioritization based on predetermined criteria [11].

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The study compared the combination of Analytic Hierarchy Process (AHP) and Simple Additive Weighting (SAW) or AHP-SAW and Analytic Hierarchy Process (AHP) and Weighting Product (WP) or AHP-WP [7] The research results show that the preference value of AHP-SAW is 0.8543 and that of AHP-WP is 0.1711. Other studies have also been conducted comparing combination of AHP-SAW and AHP-WP [8] in the case of selecting private teachers, this involves various cost and benefit data. SAW and TOPSIS methods handle costs and benefits information at the same time, but they have weaknesses in the weighting process. Weaknesses of this method can be overcome by AHP method. The AHP method is a part of Multi Attribute Decision Making (MADM) that has the advantage of obtaining more objective weighting results because it uses a comparison of Saaty scale values. (1-9) and consistent parameters is measured. However, during practical applications , AHP faces problems in calculating many pairwise comparisons and repeating the whole process if the criteria or alternatives change [9]. The AHP method is not suitable for the classification process because the calculation process does not extract profitability information. So it is used only in the weighing process [8].

Therefore, in this study, we compare the combination of AHP-SAW and AHP-WP methods to make recommendations in recruiting new employees. AHP is used to find the weight of each criterion. In this research we used criteria weighting calculations using the AHP method referring to research conducted by [11]. Meanwhile, SAW-WP is used to rank each alternative. Then the combination of these methods is compared based on comparison of accuracy, ranking results and preference values as well as sensitivity tests.

2. MATERIAL AND METHOD

This study uses three methods AHP, SAW and WP, these three methods are used to make recommendations about the best alternatives in making decisions about onboarding new employees. AHP and SAW methods are methods for solving multi-criteria problems. The Multi Criteria Decision Making (MCDM) method has been widely used to prioritize and select the most appropriate strategies. AHP is a method often used by decision makers to organize important criteria by breaking down and creating a hierarchical structure for complex problems [9]. Multiple Attribute Decision Analysis (MCDA) is based on identifying the relevant criteria for a given decision and determining their relative importance, usually by weighting. Multiple Criteria Analysis (MCA) is used when it is necessary to rank different alternatives or to choose between a limited number of alternatives openly and objectively, taking into account several criteria. [6].

In the data understanding stage, data collection is performed, followed by data analysis and assessment the quality of the data used in the study. Proper use of the AHP-SAW method requires appropriate data standards and alternative methods. The criteria used in this study are for example (C1) Psychological testing, (C2) Personality, (C3) Age, (C4) Health, (C5) Experience [11]. Flowchart method this research can view as figure 1.

2.1. Analytic Hierarchy Process (AHP)

AHP is one of the most used analysis methods for complex decision-making situations [10]. Used to find the order or ranking of priorities and various alternative solutions for decision makers. AHP is known as a flexible and efficient MCDM method. This method helps to set priorities and make the best decisions when it is necessary to evaluate both quantitative and qualitative aspects of a decision [11]. The AHP mechanism simplifies complex problem into parts which are then grouped into a hierarchy [12].

The AHP mechanism simplifies a complex problem into parts by breaking down the decision-making problem into a hierarchy of goals, qualities and choices [13]. The steps in solving problems using the AHP method are decomposition (creating a hierarchy), comparative judgment (evaluating criteria and alternative solutions), and priority synthesis (determining the priority level first) and logical consistency [7]. AHP steps, namely:

1. Determining Criteria as a basis for assessment
   The AHP method has a basic structure that can be selected and there are 5 criteria in this research. The criteria used in this research are:: Psychological tests, personality, age, health, experience.

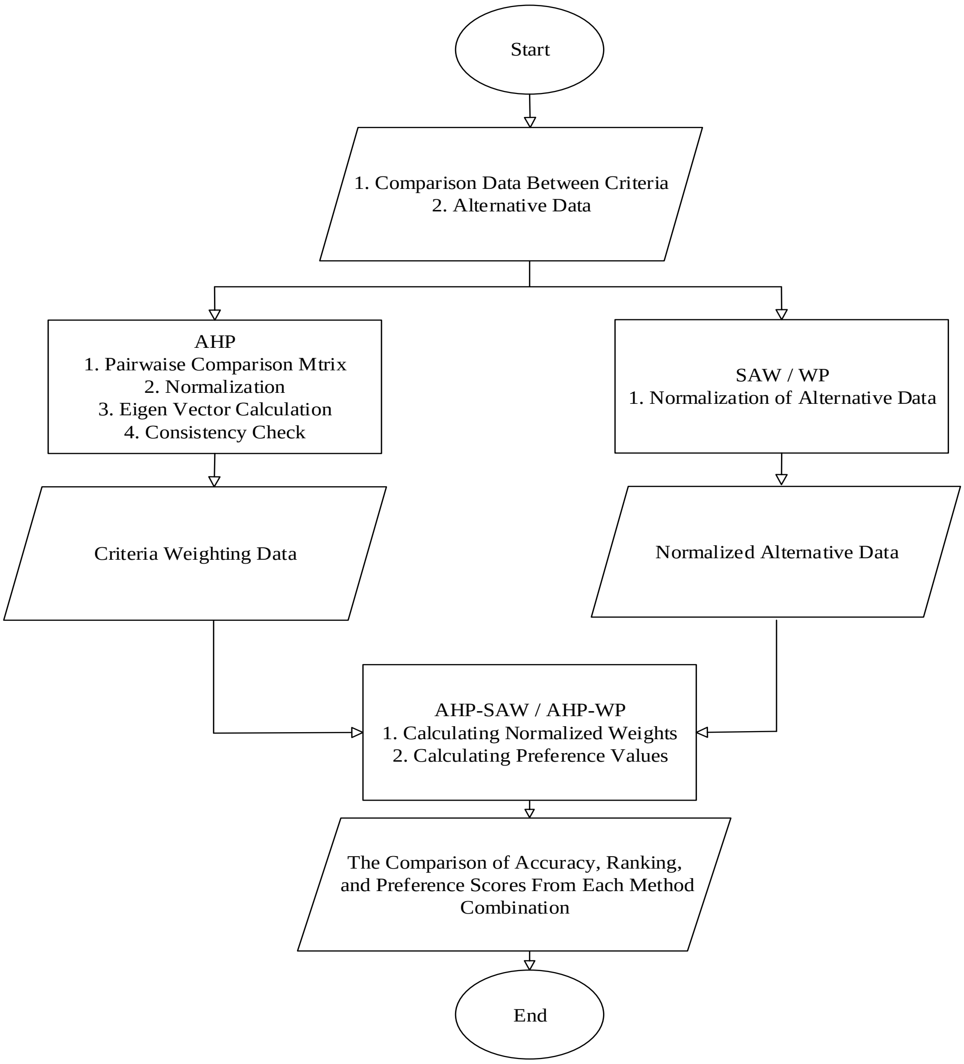

Figure 1. Research Methodology

2. Determine the criteria comparison matrix
   First a criteria comparison matrix table is created, showing that value 1 has the same important characteristics and value 3 has slightly more important characteristics. If the value is 5, then the feature is more important than . After the comparison matrix is obtained, the next step is to determine the priority of each criterion.

3. Calculating Eigenvalues
   In calculating eigenvalues, the number of consistency criteria for each column value is divided by the number of conditions, namely five criteria.

4. Find the x Max value
   To get the maximum lambda value, add up the priority results and divide by the number of criteria x Max.

5. Calculate the consistency index value
   When calculating the unit index value, enter the x Max value, then subtract the number of terms, then divide by the number of terms and subtract one.

6. Calculate the consistency ratio value
   If the consistency ratio value is calculated during a consistency check, then the calculation obtained from the consistency index results produces a consistency ratio value with a ratio that is considered uniform [10].

Table 1. Saaty Scale

Intensity of Interest	Definition
1	Equally important (Equal)
3	Moderately important (Moderate)
5	More important (Strong)
7	Much more important (Proven)
9	Absolutely more important (Extremely)
2,4,6,8	Average between values adjacent (Intermediate value)

$$\text{CI}=\frac{\mathcal{M}ax^{\lambda-n}}{n} \quad (1)$$

CI or Consistency Index is a measure used to assess how consistent the pairwise comparisons are in an evaluation. This value is calculated using the formula (Max λ - n) / (n - 1), where Max λ is the maximum eigenvalue of the comparison matrix, and n is the number of criteria being compared.

$$\text{CR}=\frac{\text{CI}}{\text{IR}} \quad (2)$$

Next, to determine the overall consistency level, the CR or Consistency Ratio is calculated using the formula CI / IR. IR, or Random Consistency Index, is a predetermined random value based on the number of criteria (n) and is used as a comparison standard. A comparison is considered consistent and acceptable if the CR value is less than or equal to 0.1. If the CR value exceeds 0.1, the comparison needs to be evaluated and revised. A consistent ratio is acceptable if the value is less than or equal to 0.1.

2.2. Simple Additive Weighting (SAW)

The basic idea is to find the weighted sum of the performance ratings of all the attributes of each alternatives, this method is a method that is widely used in MADM [14]. According to [15] One method that can be used is SAW. The SAW method requires the decision matrix (X) to be normalized to a scale that can be compared to all alternative points.

Method produces a final value in the form of a total weighted performance score for each alternative based on all the features used. You get the total option score by adding up all the scores, multiplying the score and the weight of each feature. I Gede Iwan Sudipa, 2018 In this study, weighting is performed using the AHP method followed by rank calculation using the SAW method, starting with SAW surrogate normalization to obtain preference values [15].

The priority value (Vi) is obtained based on the sum of the products of the respective preference weights (W) from the normalized row elements (R) of the matrix and the corresponding preference weights (W) from the column elements of the matrix (W). SAW steps:

1. Determine the alternative
2. Determine the criteria used in CI decision making
3. Determine the weight (W) of the criteria, which indicates the importance of the criteria in making decisions.
4. Perform normalization of the generated similarity matrix. The condition type (yield or cost attribute) determines the equation used. This step creates a normalized R matrix.
5. The process is based on the results of the sum of normalized matrices and preference weights (W). The option with the highest value is chosen as the best solution to the problem. The priority of each option (Vi) is determined by the formula 3.

$$\text{V}_\text{i}=\sum_{\text{j}}^{\text{n}}\text{W}_\text{j}\text{R}_\text{ij} \quad (3)$$

V_i is the value or rating for each alternative, W_j is the weight for each criterion, and R_{ij} is the normalized performance rating. This formula works by multiplying the weight of each criterion (W_j) by the performance rating of the alternative for that criterion (R_{ij}), then summing all these products. The sum of these calculations results in the V_i value for each alternative. The alternative with the highest V_i value indicates that it is more prioritized and considered the best solution. The greater the Vi value indicates that alternative Ai is preferred.

2.3. Weighted Products (WP)

WP is a method that requires a normalization process, because this method multiplies the assessment results for each attribute [4]. For normalization, each feature is assigned a score based on the strength of its feature weight. Method this is used for evaluating several alternatives against a set of categories or criteria [16].

In this study, weighting is performed using the AHP method, after which the rank calculation begins with the WP method with normalizing the alternatives in WP to obtain the preference value [7].

The vector value (S) is obtained by multiplying all criteria by the normalization/correction result of the alternative weights positive order of the benefit criterion and negative order of the cost criterion. The final result of the recommended value (Vi) is obtained from adding the vector value (S) to the sum of all vector values (S). WP steps :

1. Use multiplication to combine attribute ratings.
2. Each function must first be evaluated according to its ranking.
3. The weight (W) is adjusted to produce a new weight (new W) as in the equation 4.

$$W_j = \frac{w_j}{\sum w_j} \quad (4)$$

4. Find vector S and continue to find vector V used for sorting. The WP method combines attribute values using multiplication, where the rating of each attribute must first be raised to the power of the attribute's weight. This process is similar to normalization. The preference for replacing is given by equation 5.

$$S_i = \prod_{j=1}^{n} X_{ij}^{\,w^{ij}} \quad (5)$$

Where =Wj is the positive value of the income attribute and the negative value of the cost attribute. At the same time, the relative priority of each alternative is given according to equation 6.

$$V_i = \frac{\prod_{j=1}^{n} x_{ij}^{w_{ij}}}{\prod_{j=1}^{n} (x_j) w_j} \quad (6)$$

The end result of the ranking process is to achieve the highest score so the highest score (Ai) is chosen as the best choice [19].

2.4. Sensitivity Analysis

The purpose of sensitivity testing is to identify, collect, and compare the results of evaluation criteria to know which criteria are most important or most sensitive to changes in alternative rankings [18]. The sensitivity test of this study is based on the smallest range of values and variables in the regression process. The first stage of sensitivity testing was performed using three procedures that is [19]. First, sensitivity is determined by subtracting the value of the first option from the value of the second option. In general, it is built as equation 7.

$$\text{Total Sensitivity} = (Xa - Xb) \quad (7)$$

It is used to measure the sensitivity of an option (Xa) compared to another option (Xb). The goal is to determine which criterion is the most important or sensitive to changes in the ranking of alternatives. The greater the difference between Xa and Xb, the higher the sensitivity, meaning that a small change in the value of one alternative can lead to a significant change in the final decision.

Second, the sensitivity is determined when dividing the value of the first alternative by the total value of all alternatives. In general, it is built as equation 8.

$$\text{Total Sensitivity} = \frac{xi}{x} \quad (8)$$

It is used to measure the sensitivity of an alternative (X_i) compared to the total value of all alternatives (X). The goal is to determine how much a change in the value of an alternative can affect the final result. The greater the value of X_i compared to X, the higher the sensitivity, meaning that a small change in the value of that alternative can have a significant impact on the final decision.

Third, determining sensitivity is done by adding the value of the first alternative to the value of the second alternative and then dividing by two. In general, it is built as equation 9.

$$\text{Number of sensitivities} = \frac{1}{2}(Xa + Xb) \quad (9)$$

It is used to measure the sensitivity of an alternative (X_i) compared to the total value of all alternatives (X). The goal is to determine how much a change in the value of an alternative can influence the final result.

The greater the value of X_i compared to X, the higher the sensitivity, meaning that a small change in the value of that alternative can have a significant impact on the final decision.

Then, the statistical calculation of sensitivity test uses the sensitivity (Sj) for each attribute in the sensitivity test step [20] as:

1. Determine all attribute weights, Wj = 1 (initial weight value), where j = 1,2....n (number of attributes).
2. Change the attribute weights in the value range 1-2 and increase the weight value by 0.1 so that the remaining attribute weights remain the same as the original weights.
3. Apply AHP-SAW and ROC -SAW methods to given attribute weights.

Calculate the percentage change in ranking by comparing how much the ranking changes compared to the condition that the weights are the same, namely Wj = 1 (initial weight value).

3. RESULTS AND DISCUSSION

3.1. Weighting Using Analytic Hierarchy Process (AHP)

This research was conducted based on data from previous research conducted by Gede Surya Mahendraa and Putu Gede Surya Cipta Nugraha [7], where the five criteria were selected based on their relevance in evaluating individuals' suitability for a particular role. These criteria were identified through a comprehensive analysis of factors that impact performance and suitability. Calculations begin using the AHP method. There are 5 criteria, namely (C1) Psychological Test, (C2) Personality Test, (C3) Age, (C4) Health Test, and (C5) Experience. The weighting of the sources is shown in table 2.

The next step is to create a pairwise comparison scheme for each criterion used. This step is used to get the weight of each criterion used. The final results of the weighting steps for each criterion. The pairwise comparison matrix for testing can be seen in Table 2.

Table 2. Comparison of Criteria Weights

Criteria Code	C1	C2	C3	C4	C5
C1	1	3	5	9	7
C2	0.33	1	3	7	5
C3	0.2	0.33	1	5	3
C4	0.11	0.14	0.2	1	0.33
C5	0.14	0.2	0.33	3	1
AMOUNT	1.79	4.68	9.53	25	16.33

This set performs Matrix Normalization on each pair of criteria. Normalization using the AHP method is done by dividing the value of the element by the number of values in the column, and the value of the eigenvector is obtained by summing the criteria for each row as shown in Table 3.

Table 3. Matrix Normalization

Criteria Code	C1	C2	C3	C4	C5
C1	0.560	0.642	0.524	0.360	0.429
C2	0.187	0.214	0.315	0.280	0.306
C3	0.112	0.071	0.105	0.200	0.184
C4	0.062	0.031	0.021	0.040	0.020
C5	0.080	0.043	0.035	0.120	0.061

The next step is to determine the Eigen Vactor value for each criterion. Seen in Table 4.

Table 4. Eigen Vector Criteria By Resource Person r.

Criteria Code	Criteria	EV
C1	Psychological Test	0.502837
C2	Personality Test	0.260244
C3	Age	0.134358
C4	Health Test	0.034781
C5	Experience	0.067780

Based on Table 3 and Table 4 regarding matrix normalization and priority weights. The priority weight column formula is obtained by calculating the average value of each row of the normalized matrix. The next step is to calculate λ_{Max}, the first step is to multiply the pairwise comparison matrix by the eigenvector value. Each multiplication result is divided by the Eigen Vactor value and the resulting average value λ_{Max}. λ_{Max} is determined by the following steps.

$$\begin{vmatrix} 1.0 & 3.0 & 5.0 & 9.0 & 7.0 \\ 0.3 & 1.0 & 3.0 & 7.0 & 5.0 \\ 0.2 & 0.3 & 1.0 & 5.0 & 3.0 \\ 0.1 & 0.1 & 0.2 & 1.0 & 0.3 \\ 0.1 & 0.2 & 0.3 & 3.0 & 1.0 \end{vmatrix} \text{X} \begin{vmatrix} 0.5028 \\ 0.2602 \\ 0.1344 \\ 0.0348 \\ 0.0678 \end{vmatrix} = \begin{vmatrix} 2.7428 \\ 1.4133 \\ 0.6989 \\ 0.1771 \\ 0.3408 \end{vmatrix}$$

$$\lambda_{\text{max}=}\left(\frac{2,7428}{0,528}+\frac{1,4133}{0,2602}+\frac{0,6989}{0,1344}+\frac{0,1771}{0,0348}+\frac{0,3408}{0,0678}\right)/5$$

$$\lambda_{\text{max}=}\left(\frac{5,,1946+5,4315+5,2001+5,0890+5,0265}{5}\right)$$

$$\lambda_{\text{max}=5,2412}$$

After taking the value λ_{Max} You can then calculate the consistency index for source 1, following these steps:

$$\text{CI} = \frac{\lambda_{\text{max}-\text{n}}}{n-1} = \left(\frac{5,2412-5}{5-1}\right) = \frac{0,2412}{4}.= 0.0603$$

After getting the CI, you can calculate the source consistency ratio 1. Based on the Alonso-Lamata RI value, an IR of 1.12 is used, taking into account the number of criteria of 5. CR can be calculated by following these steps:

$$\text{CR} = \frac{\text{CI}}{\text{IR}} = \frac{0,0603}{1,12} 0.0538$$

CR is less than 0.1, the hierarchy is considered coherent, the calculation is considered correct and can be used as a weighting criterion.

3.2. Rank Each Alternative With Simpple Additive Weighting (SAW)

The next step is to rate each available option using the SAW method. The following is an example calculation. Conversion of Values and Categories Determined can view table 5.

Table 5. Conversion of Values and Categories Determined by HRD [15]

Value Conversion	Psychological Test	Personality Test	Age	Health Test	Experience
1 - Very Poor	IQ<80	Value <80	>33	Has a dangerous disease	Fresh Graduate
2 - Less	IQ<80	Value <80	30-33	Have an acute illness	>1 Year
3 - Enough	IQ<90	Value <85	27-30	Obesity, and antigen tests	2-4 Years
4 – OK	IQ>100	Value <90	23-26	Antigen Test (Negative)	4-5 Years
5 - Very Good	IQ>110	Value <95	19-22	Healthy	>5 Years

Qualitative data, such as the results of psychological tests, personality, age, health, and work experience, are converted into quantitative values (1-5). This conversion simplifies the calculation process in the SAW method to determine the ranking of alternatives or candidates. Each category or level within each criterion (e.g., IQ level, age range, or health status) is assigned a corresponding numerical value. A value of 5 indicates the highest preference (Very Good), while a value of 1 indicates the lowest preference (Very Poor).

Table 6 presents the alternative data for each criterion for every candidate. Each row represents a candidate (e.g., Marina, Reno, etc.), and each column represents a criterion (C1-C5). The numbers in this table are conversion values obtained from Table 5 based on the qualitative data of each candidate. For example, if Marina has an IQ of 105 (corresponding to a value of 4 in Table 5), then the number 4 will be placed under the C1 (Psychotest) column for Marina.

Table 6. Alternative Calculations for Each Criterion

X	C1	C2	C3	C4	C5
Poo	4	3	3	2	1
Marina	3	2	3	3	1
Reno	3	3	3	4	2
Riko	3	3	4	1	4
Silvia	4	2	3	4	3

X	C1	C2	C3	C4	C5
Deni	4	3	4	3	5
Dawn	5	3	4	1	3
Claudia	3	3	5	3	4
Siska	3	2	4	3	4
Fahri	5	2	3	3	4
MIN	3	2	3	1	1
MAX	5	3	5	4	5

Table 7 contains the normalized data results from Table 3.5. Normalization is the process of converting values in the table into a 0-1 scale. The goal is to ensure that all criteria have equal weight in the SAW calculation, so that no criterion dominates the others.

Table 7. Normalization of Alternative Calculations

X	C1	C2	C3	C4	C5
Poo	0.8	0.6	0.6	0.4	0.2
Marina	0.6	0.4	0.6	0.6	0.2
Reno	0.6	0.6	0.6	0.8	0.4
Riko	0.6	0.6	0.8	0.2	0.8
Silvia	0.8	0.4	0.6	0.8	0.6
Deni	0.8	0.6	0.8	0.6	1
Dawn	1	0.6	0.8	0.2	0.6
Claudia	0.6	0.6	1	0.6	0.8
Siska	0.6	0.4	0.8	0.6	0.8
Fahri	1	0.4	0.6	0.6	0.8

The process obtained during the normalization calculation is r11 = x/Max x = 4/4= 1, similar to the calculation r12 which always uses the formula x/Max x, r12 =4/5 =0.8, etc. Once the normalization calculations are done, it's time to do the ranking calculations. The table results are converted to matrix form and multiplied by the priority weighting results. Calculation results are in table 8.

Table 8. Ranking and Alternative Calculation Results

Alternative	Preference Value	Ranking
Dawn	0.814094	1
Fahri	0.762642	2
Deni	0.754551	3
Claudia	0.667299	4
Poo	0.666499	5
Silvia	0.655475	6
Riko	0.626515	7
Reno	0.593400	8
Siska	0.588379	9
Marina	0.520839	10

Table 8 presents the final results of the SAW calculation, including the preference values and rankings of each candidate. A higher preference value indicates a more favorable candidate, while the ranking represents the order of candidates based on their preference values.

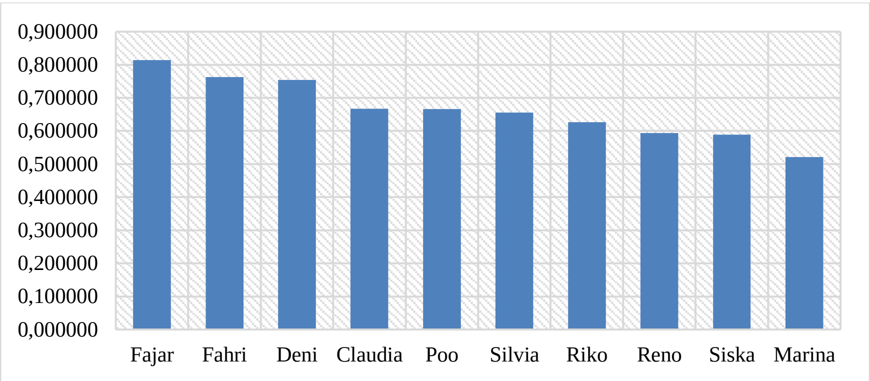

Figure 2. Preference Value Results

3.3. Rank Each Alternative With Weighted Product (WP)

Then, an alternative normalization calculation is performed to find the vector value (S) using the WP method to find the priority value, the priority value, and the rank are calculated. Based on the previously identified surrogate data, the WP method obtains useful condition vector values by multiplying the surrogate values that give weights to the criteria generated by the AHP method. The results of calculating alternative vector values are presented in Table 9.

Table 9. Preference Values

No	Preference Value
1	0.5028
2	0.2602
3	0.1344
4	0.0348
5	0.0678

After getting the vector value, calculate the priority value by multiplying all the alternative vector values and dividing by the total number of vector values. The calculation of recommended values using AHP-WP is presented in Table 10.

Table 10. Normalization of Alternative Calculations

Alternative	C1	C2	C3	C4	C5
Poo	0.8	0.6	0.6	0.4	0.2
Marina	0.6	0.4	0.6	0.6	0.2
Reno	0.6	0.6	0.6	0.8	0.4
Riko	0.6	0.6	0.8	0.2	0.8
Silvia	0.8	0.4	0.6	0.8	0.6
Deni	0.8	0.6	0.8	0.6	1
Dawn	1	0.6	0.8	0.2	0.6
Claudia	0.6	0.6	1	0.6	0.8
Siska	0.6	0.4	0.8	0.6	0.8
Fahri	1	0.4	0.6	0.6	0.8

The results of preference values and ranking when using AHP-WP are shown in table 11 and figure 3.

Table 11. Preference Values and Ranking Using AHP -WP

Alternative	Preference Value	Ranking
Dawn	0.1037289	1
Deni	0.1029597	2
Fahri	0.1022327	3
Claudia	0.1006516	4
Silvia	0.0997192	5
Poo	0.0996042	6
Riko	0.0992046	7
Reno	0.0984352	8
Siska	0.098096	9
Marina	0.0953677	10

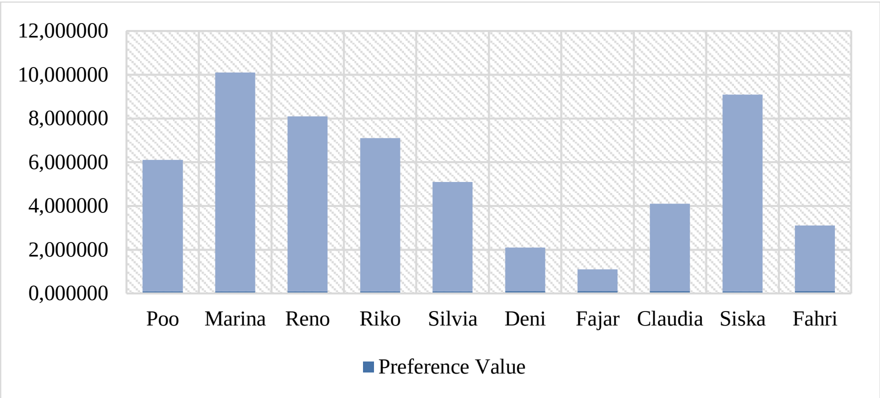

Figure 3. Results of Preferences Values

3.4. Sensitivity Analisys

The first step is the sensitivity analysis test of the AHP-SAW and AHP-WP methods presented in Table 12 and figure 4. The sensitivity analysis test is performed through three procedures according to formulas (7) to (9).

Table 12. Sensitivity Test Results

	AHP-SAW	AHP-WP
Sensitivity 1	0.0326	0.0009
Sensitivity 2	0.1000	0.1000
Sensitivity 3	0.6647	0.1000

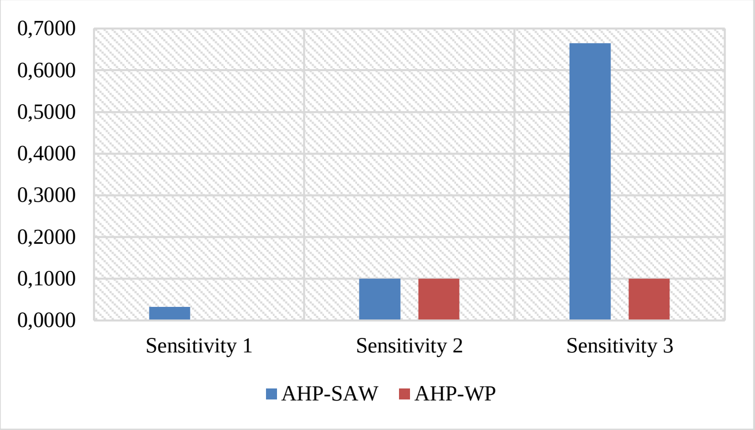

Figure 4. Results of Sensitivity Values

This study compares the AHP-SAW and AHP-WP methods in new employee selection using criteria such as Psychological Test (C1), Personality Test (C2), Age (C3), Health Test (C4), and Experience (C5). The results show that although the same candidate ranked first in both methods, such as candidate Dawn who ranked first in SAW with a value of 0.814094 and WP with a value of 0.1037289, there is a significant difference in preference values between the methods. AHP-SAW tends to be more stable against changes in the weight of criteria, while AHP-WP is more sensitive, with a sensitivity value of 0.0326 for AHP-SAW and 0.0009 for AHP-WP. These results align with previous studies, such as the one by Bagus Primahudi et al. [1], which used AHP-SAW for multi-criteria decision-making, and Julhani and Limansyah [2], who applied AHP-WP for employee recruitment. AHP-SAW is more suitable for decisions that are easy to understand and stable, while AHP-WP is more appropriate for situations with more complex interdependencies between criteria.

4. CONCLUSION

Based on the research conducted to compare the combination of calculations using the AHP-SAW and AHP-WP methods in a new employee hiring decision case study, different priority values and rankings were obtained. For example, candidate Dawn ranked first with a value of 0.814094 using the SAW method and a value of 0.1037289 using the WP method. This difference is due to the differing standardization methods between SAW and WP, where small changes in criterion weights can affect the ranking results. The sensitivity analysis showed that AHP-SAW is more stable to changes in criterion weights, with a sensitivity value of 0.0326, while AHP-WP is more sensitive, with a sensitivity value of 0.0009. For future research, it is recommended to expand the selection criteria, such as technical skills and organizational culture. Testing AHP-SAW and AHP-WP on other decision-making scenarios, as well as integrating methods like Fuzzy AHP or TOPSIS, could provide more insights. The development of AI or machine learning-based systems can also enhance the speed and accuracy of the selection process.

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