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Comparative Analysis of Saw and AHP Methods in The Decision Support System for The Selection of The Best Employee at The Teacher Professional Education Agency, State University of Surabaya

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ABSTRACT

The success of an institution is highly dependent on the quality of its human resources (HR). Employee performance evaluation is essential in determining strategic decisions such as promotions, mutations, and competency improvement. However, the manual evaluation process often faces obstacles such as delays and human error. This research aims to develop a decision support system (SPK) to select the best employees by applying the analytical hierarchy process (AHP) and simple additive weighting (SAW) methods. The research method used is the System Development Life Cycle (SDLC), which includes the stages of planning, needs analysis, system design, implementation, testing, and maintenance. Testing is carried out by Black Box Testing, White Box Testing, and acceptance testing by users (acceptance test). Based on the tests conducted using data per semester from all employee activities in performance assessment, the author concludes that the appropriate method based on the dataset used from the comparison of the use of the AHP and SAW methods in the selection of the best employees at the Teacher Professional Education Agency of the State University of Surabaya is the AHP method which gets results of 100% precision, 84% recall, 84% accuracy, and 91% of F1 scores. The results show that the methods and algorithms used can produce the best alternative recommendations for the Teacher Professional Education Agency of the State University of Surabaya. This study concludes that implementing AHP-based SPK can increase objectivity and efficiency in selecting the best employees. The implications of this research are expected to help institutions manage employee performance more systematically and accurately, as well as encourage the improvement of the quality of human resources in the academic environment.

Introduction

The quality of human resources (HR) is one of the factors that can increase the productivity and performance of an agency (organization), no matter how many human resources work in it. (Syakroni, 2023). Therefore, agencies must conduct employee performance assessments to determine how well or poorly they are doing their jobs. (Hamidah et al., 2021). Nowadays, technology is developing very quickly. In addition to hardware and software, today's calculation field is growing rapidly. (Husna et al., 2022; Sokop et al., 2016)One of the calculation methods that will be developed will include a decision support system. Decision support systems are a branch of intelligent systems that provide information. (Editioi Efraim Turban Jay Aronson & Liang, 2005). This prompted the author to create a decision support system to assist institutions in selecting the best web-based employees using the Laravel framework. (Javed et al., 2024). Laravel is one of the PHP frameworks that emphasizes simplicity and design flexibility. Just like other Frameworks, Laravel is built based on MVC (*Model-View-Controller*) (Skvorc et al., 2014).

The Unesa Teacher Professional Education Agency is responsible for teacher professional certification. Overall, job performance is not only measured by physical work results; It also includes many things, such as employability, discipline, working relationships, initiative, leadership, and, depending on the specific field and job of a particular nature. (Yusuff, 2023). Human resource managers can plan for career promotions, training and skill development, salary increases, promotions, and other management decisions based on specific feedback from performance evaluations. Because organizations want the best performance, performance appraisals show employees' effectiveness and accountability. Assessments help employees determine their goals, paths, plans, and career development by providing feedback on various things, including skills, strengths, weaknesses, and potential.

The Unesa Teacher Professional Education Agency evaluates employees within 6 months based on SKP (Employee Performance Targets) to improve employee performance. The employee with the highest rating score is the best. However, when evaluating employees, the institution often experiences delays, which take a longer time, approximately one to two weeks. This sometimes makes the work of the appraisal officer difficult because the evaluation is still done manually, and there is human error in the calculation that can cause mistakes in selecting the best employees. Therefore, the author took the initiative to design a decision support system (SPK) that can help identify the best employees at the Unesa Teacher Professional Education Agency.

Several models can make SPK, including *Simple Additive Weighting* (SAW) and *Analytical Hierarchy Process* (AHP). The SAW method is used because it has advantages such as being easy to understand, being more flexible, solving complex problems, and carrying out learning based on human knowledge and experience in problem-solving. The AHP method is used because it transforms a broad and unstructured problem into a flexible and easy-to-understand model; AHP provides a measurement scale and a method for prioritization scaling, taking into account the logical consistency between the

assessments used in prioritization and generating an overall desirability rating of each alternative.

The previous research on selecting the best employees using a dataset decision support system came from PT. Persada Nusantara Telecommunications, including research conducted by Qibran Noval, Yopi Handrianto, and Hendra Supendar in 2020 using the SAW method for the selection of the best employees based on the parameters of Responsibility, Loyalty, Discipline (Attendance), Expertise, Teamwork (Noval et al., 2020). The work productivity of a workforce is a measurable, tangible result that a person can achieve in a real work environment for every unit of time. Work productivity is influenced by work capacity (one of which is physical freshness), workload, and additional burden due to the environment due to physical, chemical, biological, and social factors. (Simanjuntak & Susetyo, 2022; Sudiajeng & Kerja, n.d.). Penelitian lain yang menjadi rujukan dari penulis yaitu yang dilakukan oleh Ratika Duri, Titin Kristiana yang menggunakan metode gabungan TOPSIS dan SAW dalam menentukan karyawan terbaik(Metode et al., 2022). Based on previous research that only used one method in determining the results of selecting the best employees based on ranking. Therefore, this study will use the AHP and SAW methods with additional variables added, namely fitness, to get a more accurate accuracy value in the use of these two methods for the selection of the best employees according to the parameters used, and there is a differentiating variable from the previous study, namely fitness.

This final project research aims to build a decision support system application to determine the best employees with the AHP and SAW methods based on the specified parameters. The Analytic Hierarchy Process (AHP) method is a general measurement theory used to lower the ratio scale of discrete and continuous paired comparisons. These comparisons can be drawn from measurements or fundamental scales that reflect the relative strength of preferences and feelings. (Saaty, 1987), while meaning of the SAW method itself is a method that seeks the sum of the performance score weights for each alternative for all attributes (Hussain et al., 2015)This inspires the author to use these two methods to find the best accuracy value that can be recommended to get the best decision results based on ranking.

The purpose of designing this decision support system is as follows: to determine the best employees at the Unesa Teacher Professional Education Agency and be able to provide the best accuracy value information in the comparison of the SAW and AHP methods used. The benefits of making this decision support system are as follows: to help the management in recapping data, determining the best employees, and encouraging employee performance to be better, this system also contributes to the achievement of the institution's vision to advance services and get the best accuracy score in the comparison of the two methods used in the application that the management of BPPG Unesa will use to compare which is the best between employee.

Method

The method used in making applications uses *the System Development Life Cycle* (SDLC) process. SDLC is a method to analyze and design a system where the system has been developed well through the use of a specific analyst and user activity cycle (Dwanoko, n.d.; Prastowo et al., 2023).

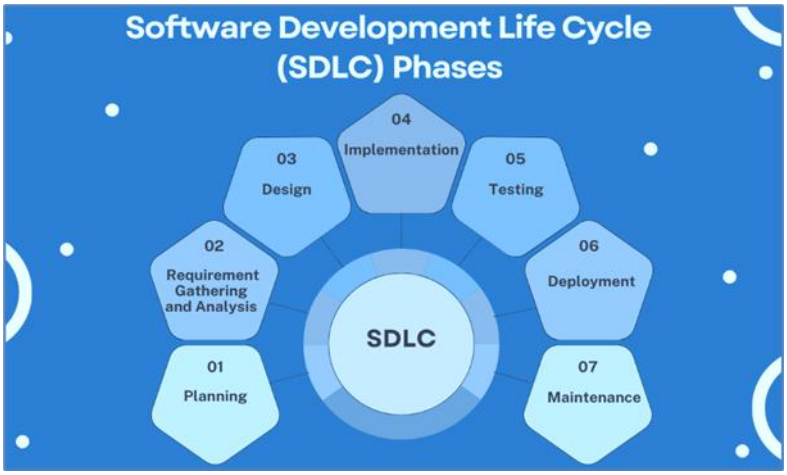

Figure 1. SDLC Method

The scope of activities in the SDLC method is (Prastowo et al., 2023):

1. Identifying Problems *(Planning).*
   The author pinpoints the problems precisely in the research. Includes determining assessment standards and objectives that must be achieved.
2. Determine the requirements and needs of the system *(Requirement Gathering and Analysis).*
   At this stage, the author tries to understand the information needed and analyze the user's needs to achieve the desired goal.
3. Design the system.
   In this stage, the author designs the system and creates a database file to ensure accurate data is entered into the information system.
4. Implement the software *(Implementation).*
   At this stage, the author implements the necessary initial software, including manual procedures and *online* and *website help.*
5. System Testing *(*Testing).
   At this stage, the author first tests the system that has been created. The authors themselves conduct some testers, and system analysts undertake others.
6. System Deployment.
   Deployment is the process of installing and configuring applications so that end users can use them effectively. Overall, deployment is a critical process that requires special attention.
7. System Repair *(Maintenance).*

The last phase in the Software Development Life Cycle (SDLC) is carried out to ensure that the software continues to function correctly.

The research is at the Teacher Professional Education Agency, W1 Building, State University of Surabaya, Jl. Raya Unesa Campus, Lidah Wetan, Lakarsantri District, SBY City, East Java 60213.

Results and Discussion

Software and Hardware

In implementing the design that has been made, several essential things need to be considered so that the system can function optimally. The two main things that are always required are hardware and software. Hardware includes all the physical components that support the system, while software is programs and applications that perform the desired functions. They complement each other and are crucial to ensure that the system works properly and meets the user's needs.

1. Development

The author uses the following software and hardware to create and develop a decision support system application that uses the AHP and SAW methods.

a. Software Specifications

To implement the system design that has been developed, several software is needed to create a decision support system application that uses the Analytical Hierarchy Process (AHP) and SAW methods.

1) OS

Microsoft Windows can be used in the operating system. Windows 10 (32 or 64-bit) and Windows 11 (64-bit). However, the author suggests using Windows 11 (64-bit) because Windows 10 (32 or 64-bit) will no longer receive official support shortly.

2) Visual Studio Code

Visual Studio Code (VS Code) is a source code editor developed by Microsoft to support the application development process (Nur Ihsani, 2021; Wilyanto et al., 2023). VS Code is available for multiplatform operating systems, namely Windows, Mac, and Linux.

3) Web Browser

A web browser is a software program that helps people access, retrieve, and display content on the internet. (Rachmad et al., 2023).

4) XAMPP

The XAMPP developer program is beneficial for creating PHP and MySQL-based websites. The advantage of this computer program is the ability to function as an Apache web server for website development simulations. This web development program supports popular web technologies such as PHP, MySQL, and Perl. Using this program, web programmers can test their web applications and show them to others directly from their computers without being connected to the

internet. Web developers can quickly create database-based web applications with XAMPP because it has the same PHPMyAdmin database management features as those on a real hosting server.

5) Laravel

Laravel is a PHP framework designed for web application development with a clean and elegant approach. (Prstačić, 2021)According to various journals and literature, it offers features that make it easier for developers to build applications, such as easy routing and a robust templating system. In this development, the author uses the popular LTE Admin basic template.

b. Hardware Specifications

The hardware specifications used by the author to develop the system are 1 unit of UMPC / Mini Laptop, which has the following specifications:

1) Processor Intel Core i7-1195G7 @ 2,90GHz (8 Core CPU)
2) Integrated Intel Iris Xe Graphic
3) Ram 16 GB GDDR4 Dual Channel
4) Display 8” LCD IPS Panel FHD 1920x1080 @60 Hz
5) SSD NVME Kapasitas 1 TB

2. Implementation

a. Software

To implement the application, the user needs a *web browser application program* such as *Google Chrome, Mozilla Firefox, Microsoft Edge,* and the like, which is connected to the internet to access the program page.

b. Hardware

Hardware is used to run the application system that the author has developed. The following is an example of the minimum specifications of the computer device needed:

1) Operating System: Windows XP, 7, 8,10, 11 or Linux
2) Display: 15.6", 1366x768, 60 Hz
3) Storage Space: 320GB, 5400RPM, SATA II, 2.5"
4) CPU : Dual Core @2,5 GHz, 5 GT/s DMI, 2MB, Socket LGA1155

Trial

The author created a test run for the design and manufacture of this application, and the results will be described in this section. The author divides this trial into black box testing and an acceptance test.

1. Black Box Testing

One of the software testing methods that focuses on the functional side is black box testing. It is mainly related to the input and output functions of an application's data, which helps determine whether it is running according to expectations. The following are the features provided and the results of *the black box* test :

a. Login Page

An explanation of the description of the login menu that will be used for the system is as follows:

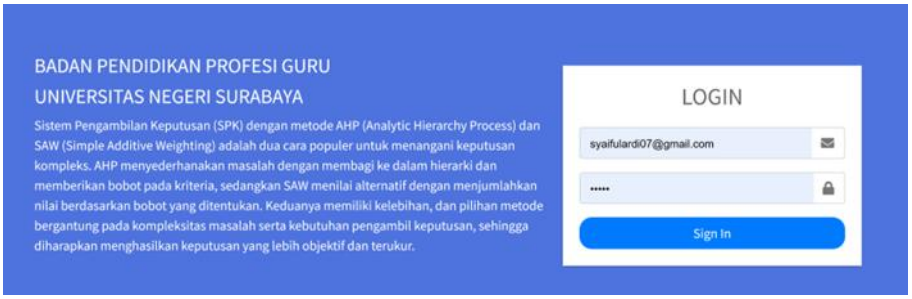

Figure 1. Login Page

In Figure 1, users are asked to enter their username and password before entering the dashboard or the main web page.

a. Dashboard Page

The dashboard page is the main web page the user will visit after logging in to the system. This page displays the various menus in the system. Here's an overview of the developed web dashboard page:

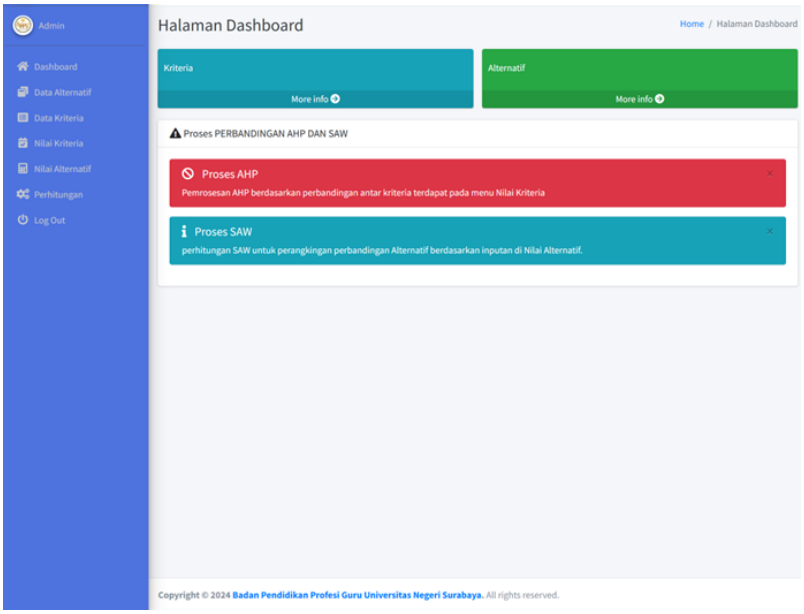

Figure 12. Dashboard Page

The dashboard page displays menus ranging from data input to logging out of the developed web system.

b. Criteria Data Page

The criteria data page contains the criteria data inputs. Here's the description:

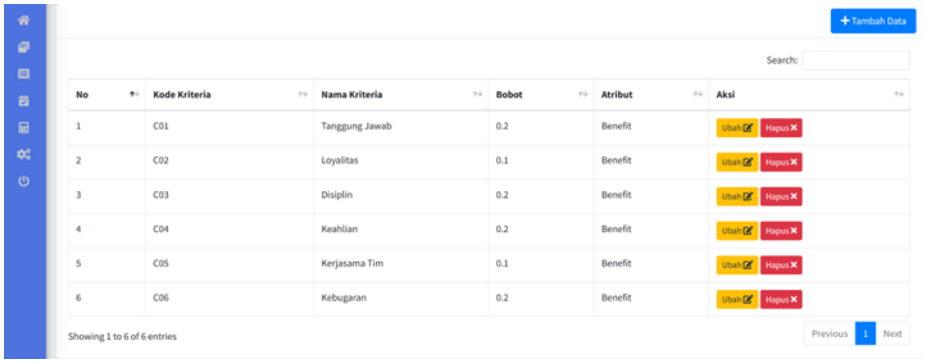

Figure 23. Dashboard Page

This criteria data page allows users to add, change, and delete criteria data that will be used to determine the best employees.

c. Alternate Data Page

The image below is a visualization of the alternate data page. Here's the description:

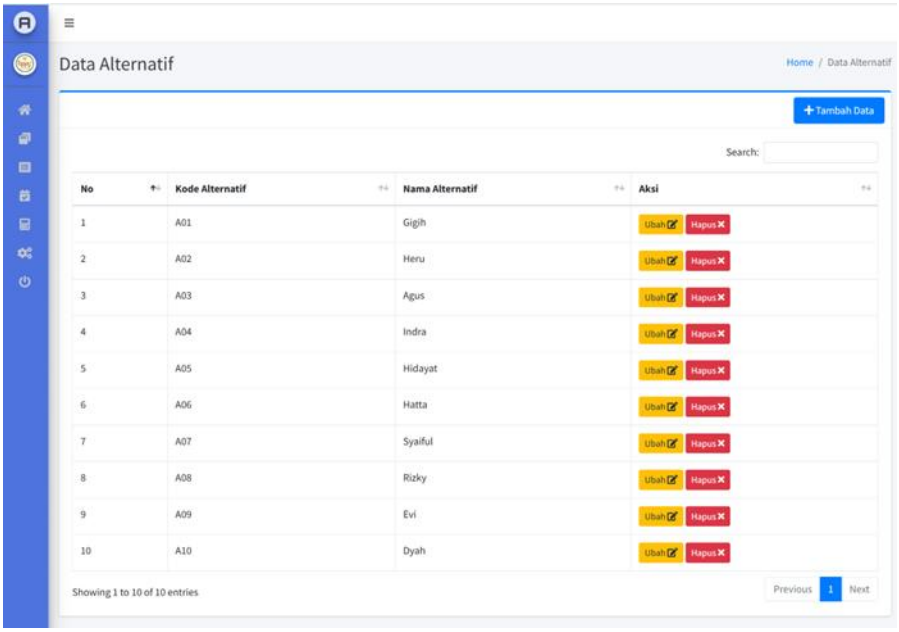

Figure 34. Alternative Data Page

This alternate data page is where users can add, change, and delete data on criteria that will be used to select the best employees.

d. Criterion Value Page

This criterion value page is a page that displays the criteria values entered by the user. Here's an overview:

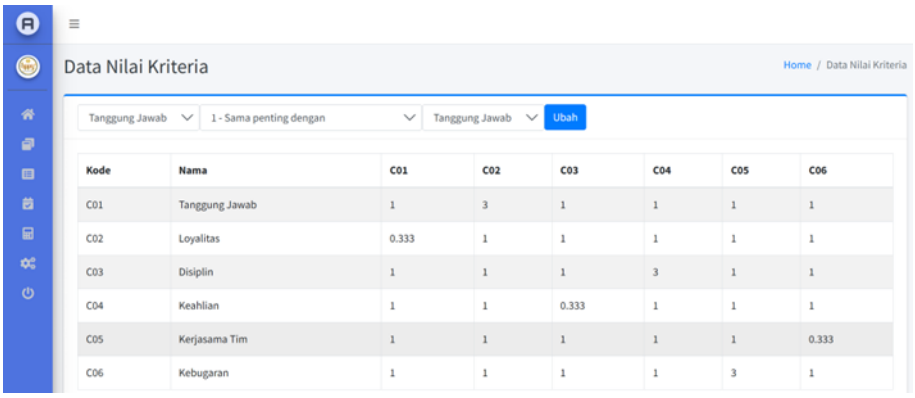

Figure 45. Criterion Value Page

The Criterion Value page provides the value of the criteria input by the user. On this page, the user can change the value of the criteria used by the system.

e. Alternative Values Page

This criterion value page is a page that displays alternative values that the user inputs. Here's the description:

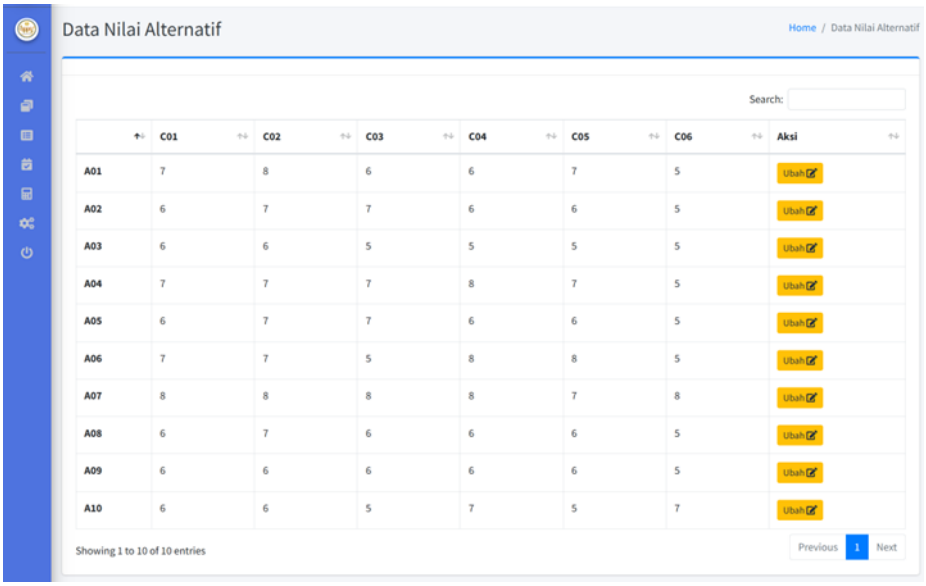

Figure 56. Alternate Values Page

The Alternative Value page provides alternative values or value data that the user inputs. On this page, the user can change the alternative values used by the system.

f. Chart Page of AHP Method Ranking Results

On this page, the system displays a graph of the ranking results of the *AHP method*. Here's the description:

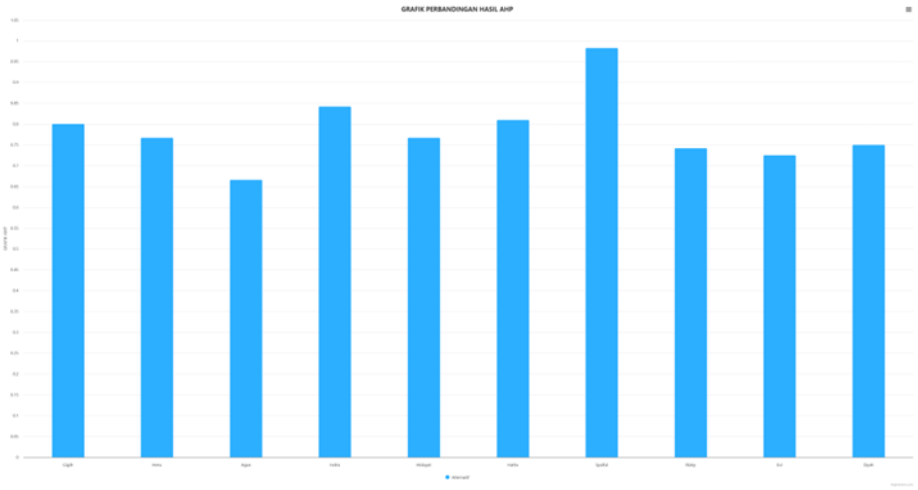

Figure 7. AHP Method Employee Ranking Chart Page

This page is the result of calculating the criteria to determine the best employee.

g. SAW Method Ranking Results Graph Page

On this page, the system displays a graph of the ranking results of the SAW method. Here's the description:

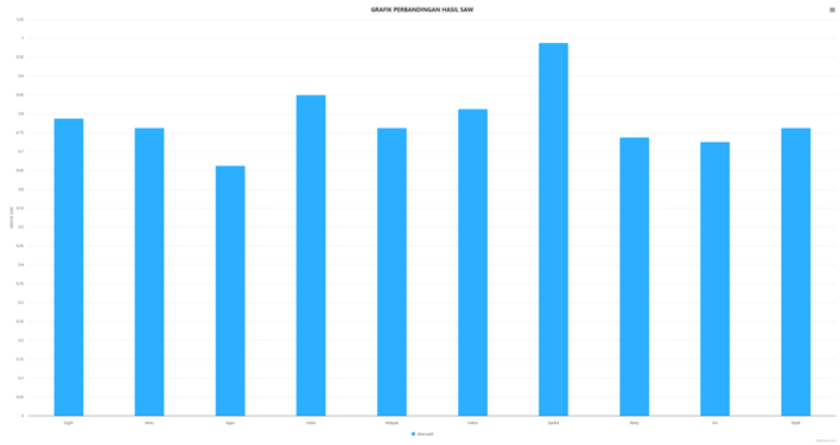

Figure 8. SAW Method Employee Ranking Chart Page

Figure 8 explains that this page results from a selection process using criteria to determine the best employees.

1. *White Box* Testing

White box testing assesses the details of a program's procedural design to ensure it meets expectations. (Aniche, 2022). This test is carried out on the application system to run it and provide the results of employee ratings to users. In general, it targets three goals to be achieved, and testing will be conducted in the following ways:

a. Case Study 1: To display employee data. The system can display employee data (alternative); the results of the process can be seen in Figure 4.8:

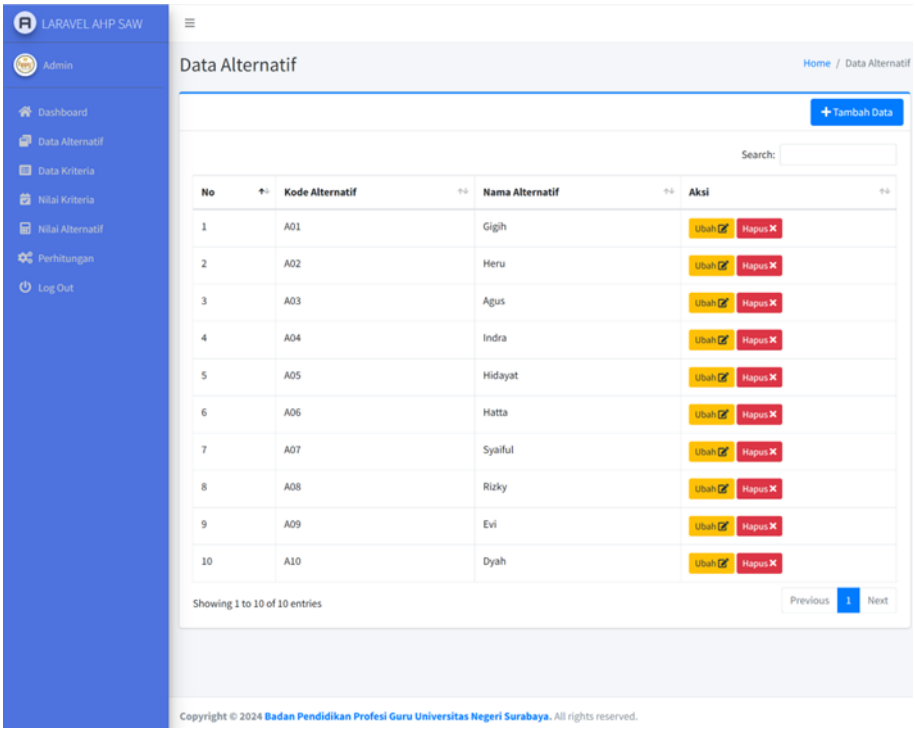

Figure 9. Employee Data Visualization (alternative)

b. Case Study 2: The system can determine the best employees at the Teacher Professional Education Agency of the State University of Surabaya based on rankings using *the AHP* and *SAW methods*.

The following *step-by-step* to determine the best employees include:

1) Adding Criteria to the Criteria Data Page

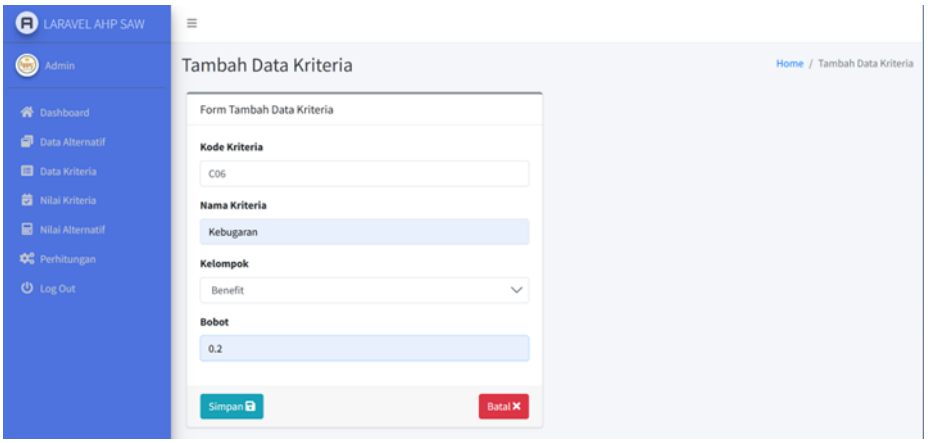

Figure 10. Add Criteria Menu

Figure 4.9 above shows a menu to add criteria used in calculating the AHP and SAW methods. The user must fill in the data to determine the weight value before entering the ranking calculation menu. The input data will be stored in the *database*, and the user can proceed to the following menu.

2) Alternatif Adding Alternatives to an Alternate Data Page

Figure 6

Figure 4.10 above explains that the user must complete the menu to add alternative data to process the calculation of AHP and SAW and determine the ranking.

3) Alternative Top-Up Menu

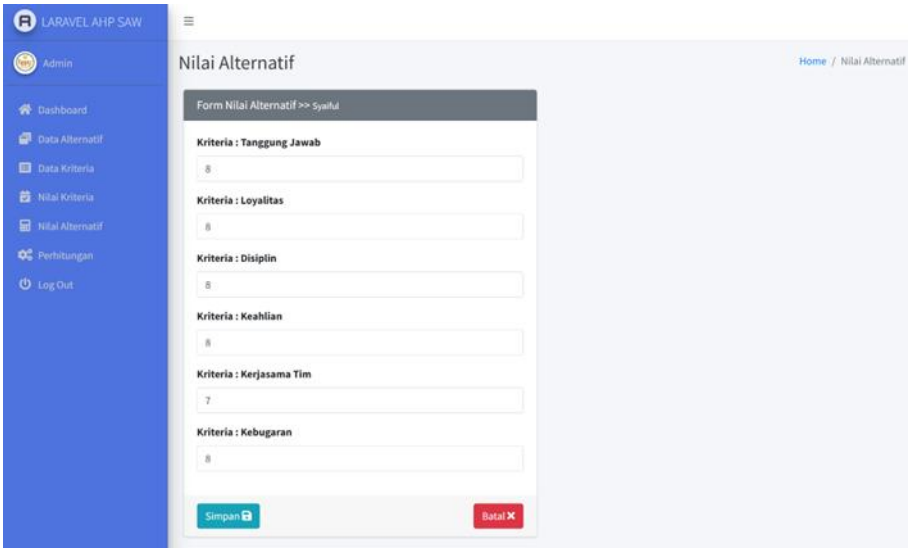

Figure 7

Figure 12. is a menu to add alternative values that users use before calculating rankings. If the data has been populated, the data will be saved to the *database*, and the user can proceed to the next stage.

4) Change Criteria Value Menu

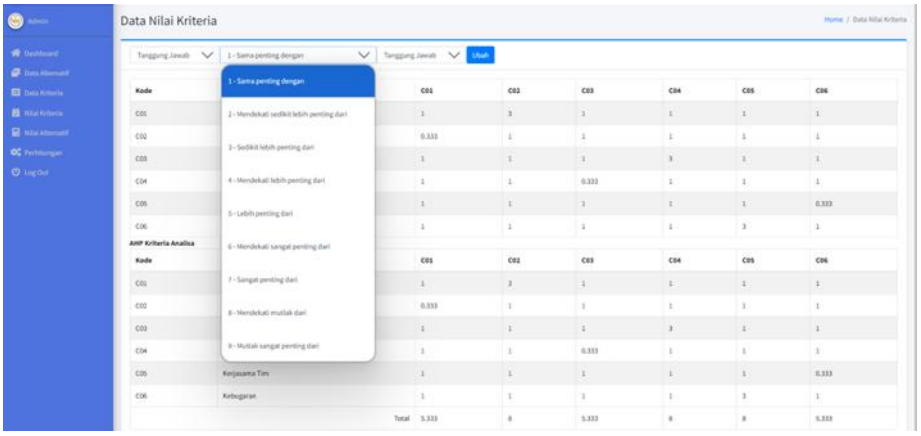

Figure 8

Figure 13 explains that in the menu, the user can change the value of the criteria that have been input to be stored in the database. After that, the user can proceed to the following process.

5) *SAW Menu of AHP and SAW Ranking Comparison Results*

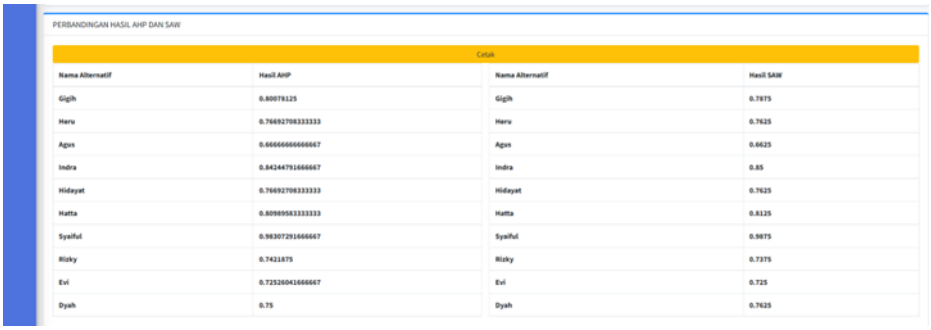

Figure 14. AHP *and* SAW *Ranking Comparison Results Menu*

In Figure 4.13, it is explained that this page is the result of calculating the selection process using the criteria used. It can also be seen that the top rank is a worker named Syaiful. Based on the alternative value data in Figure 4.11, Syaiful has a higher score than other employees.

6) *Chart Display Menu of AHP and SAW Comparison Results*

In this chart display menu, the author uses the Laravel plugin from the Highcharts.com site, where this page displays charts according to the data stored in the database.

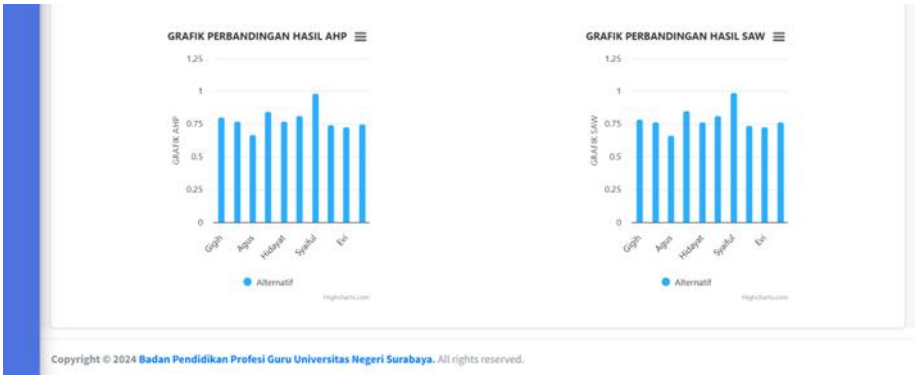

Figure 15. AHP *and* SAW *Ranking Comparison Chart Display Menu*

Figure 15 explains that this page compares the rankings of the two selection methods, which use various criteria to determine the best employees.

7) Comparison Report Print Menu

KEMENTERIAN PENDIDIKAN TINGGI, SAINS DAN TEKNOLOGI
UNIVERSITAS NEGERI SURABAYA
BADAN PENDIDIKAN PROFESI GURU
Kampus Unesa 2, Jl. Raya Kampus Unesa, Lidah Wetan, Surabaya 60213
Telepon : +6231-51169396, Faksimil : +6231- 51169396
Laman : https://ppg.unesa.ac.id/ , Email : ppg@unesa.ac.id

PERBANDINGAN HASIL AHP DAN SAW

Nama Alternatif	Hasil AHP	Nama Alternatif	Hasil SAW
Gigih	0.80078125	Gigih	0.7875
Heru	0.76692708333333	Heru	0.7625
Agus	0.66666666666667	Agus	0.6625
Indra	0.84244791666667	Indra	0.85
Hidayat	0.76692708333333	Hidayat	0.7625
Hetta	0.80989583333333	Hetta	0.8125
Syaiful	0.98307291666667	Syaiful	0.9875
Rizky	0.7421875	Rizky	0.7375
Evi	0.72526041666667	Evi	0.725
Dyah	0.75	Dyah	0.7625

Figure 916. Print Menu of *AHP* and *SAW Ranking Comparison*

Figure 16 explains that this page contains the final calculation process for comparing the two methods. Users can see a report on the calculation results for comparing AHP and SAW methods and tables and charts that the system has processed on this page.

c. Case Study 3: To get the best accuracy value in comparing AHP and SAW methods used in the system.

The test was carried out to obtain an accurate accuracy value using *a confusion matrix. The Confusion Matrix* is a tool used to assess the performance of classification models in machine learning. This table shows the number of correct and incorrect predictions divided by categories. The chaos matrix provides an in-depth picture of how the model works in data classification. In this test using data from 6 different months (semesters), the data is said to be appropriate if the results of the system calculation with the actual data in the field are the same. The results of the testing of both AHP and SAW methods can be seen in the following table:

1) Analytical Process Hierarchy Method (AHP)

Perhitungan dari hasil confusion matrix pada pengujian metode AHP bisa dilihat pada table 1 berikut ini:

Table 1. AHP Confusion Matrix Results

No	Month of Test Data	Prediction Data	Actual Data	Information
1	June	Syaiful	Syaiful	*True Positive*
2	July	Hidayat	Rizky	*False Negative*
3	Agustus	Indra	Indra	*True Positive*
4	September	Gigih	Gigih	*True Positive*
5	October	Heru	Heru	*True Positive*
6	November	Syaiful	Syaiful	*True Positive*

Source: Data processed

Based on the results of the above test, the calculation of precision, recall, and accuracy obtained is as follows:

Table 2. AHP Confusion Matrix Results

X		True Value	
		TRUE	FALSE
Prediction Value	POSITIVE	5	0
	NEGATIVE	0	1

Source: Data processed

Based on the information in Table 2 above, the evaluation of the *confusion matrix* for *precision, recall, accuracy,* and F1 Score values can be calculated with the following formula:

$$Precision = \frac{TP}{TP+FP} \qquad \text{F 4.1}$$

$$Recall = \frac{TP}{TP+FN} \qquad \text{F 4.2}$$

$$Accuracy = \frac{TP}{Jumlah\ Data} \text{ x100} \qquad \text{F 4.3}$$

*F1 Score = 2 * (Recall*Precision) / (Recall+Precision)* F 4.4

$$Precision = \frac{5}{5+0} = 1 \text{ x } 100\% = 100\%$$

$$Recall = \frac{5}{5+1} = 0{,}84 \text{ x } 100\% = 84\%$$

$$Accuracy = \frac{5}{6} \text{ x100} = 84\%$$

*F1 Score = 2 * (0,84*1) / (0,84+1) = 0,9130434782608696*

0,9130434782608696 x 100% maka diperoleh 91,34%

2) Metode *Simple Additive Weighting* (SAW)

The calculation of the results of the confusion matrix in the SAW method test can be seen in the following table 3:

Table 3. There was Confusion Mother's Look

No	Month of Test Data	Prediction Data	Actual Data	Information
1	June	Rizky	Rizky	*True Positive*
2	July	Agus	Indra	*False Negative*
3	August	Indra	Indra	*True Positive*
4	September	Gigih	Gigih	*True Positive*
5	October	Hidayat	Heru	*False Negative*
6	November	Syaiful	Syaiful	*True Positive*

Source: Data processed

Based on the results of the above tests, the calculation of precision, recall, and accuracy obtained is as follows:

Table 4. AHP Confusion Matrix Results

X		True Value	
		TRUE	FALSE
Prediction Value	POSITIVE	4	0
	NEGATIVE	0	2

Source: Data processed

Based on the information in Table 4 above, the evaluation of the *confusion matrix* for *precision, recall, accuracy,* and F1 Score values can be calculated below:

$$Precision = \frac{4}{4+0} = 1 \text{ x } 100\% = 100\%$$

$$Recall = \frac{4}{4+2} = 0{,}67 \text{ x } 100\% = 67\%$$

$$Accuracy = \frac{4}{6} \text{ x100} = 67\%$$

*F1 Score = 2 * (0,67*1) / (0,67+1) = 0,8023952095808383*

0,8023952095808383 x 100% maka diperoleh 80,23%

The data testing results that the system has carried out obtained *100% precision, 84% recall, 84% accuracy, and 91.34% F1-score* with the AHP method. The SAW

method obtained 100% precision, 67% recall, 67% accuracy, *and 80.23% F1 score.* From the results of the two methods, it can be concluded that the AHP method is more accurate in determining the best employees at the Teacher Professional Education Agency of the State University of Surabaya, referring to the highest F1-score results.

2. Admission Test

To determine the extent to which the company's management can accept the supplier selection decision support system application, the tests were tested using the AHP and SAW methods after the system's design. The respondents were described as personality test takers. In addition to the application's appearance, the system as a whole is also evaluated.

The trial was carried out based on four assessment points, namely:

a. The overall display or visual of the application system
b. Ease of use of the system *(User Friendly)*
c. The speed at which the system processes inputs to outputs
d. The precision or accuracy of the results obtained from the system process.

The trial was carried out on 12 people, from the institution's leadership to students as respondents who conducted the test. Respondents were asked to provide an assessment in the form of a scale of 1 to 5 with the following information:

1 = Very Less,2 = Less,3 = Enough,4 = Good, 5 = Very Good

The points that are the benchmark for assessment are:

a. App Display or Visual
b. Ease of running the application (User Friendly)
c. Speed of process in displaying test tests and test results
d. Accuracy or accuracy of calculation results

For more clarity, it can be seen in the following table 5:

Table 5. Respondent Test Results

No	Name	Position	Categories Assessment			
			a	b	c	d
1	Fatkur Rohman K.	Director of BPPG	4	3	4	3
2	Faridha Nurhayati	Secretary of BPPG	4	4	4	4
3	Julianto	Head of Academic Division	4	3	4	3
4	Muhammad Reza	Head of Cooperation Division	5	4	5	4
5	Ronggo Alit	Head of PPL Section	4	3	4	4
6	Dhani Kristriandri	Head of Quality Assurance Section	3	4	4	4

No	Name	Position	Categories Assessment			
			a	b	c	d
7	Isnawati	Head of the Alumni and Tracer Study Section	4	4	4	4
8	Juanita	Head of Office	4	4	4	4
9	Sony	Finance Division	4	4	4	4
10	Valenza	Student	4	3	4	4
11	Nadia	Student	4	4	4	3
12	Muhammad Ali Said	Student	4	3	4	3
Average			**4**	**3,583333**	**4,083333**	**3,666667**
Rounding			**4**	**3,6**	**4,1**	**3,7**

Source: Data processed

From the details of the assessment of the 12 respondents in Table 4.3 above, it can be concluded based on the points/aspects assessed from the application as follows:

Table 6. Recap of Respondent Assessment Results

Point	Assessed aspects	Average Score
a	Visual	4
b	User Friendly	3,6
c	Process	4,1
d	Result	3,7

Source: Data processed

The data recap of the results of the respondents' assessment above is the average data of the questionnaire results given to 12 respondents.

The following is an analysis of the respondents' assessments of the application system made at each assessment point.

1. First Assessment Points

The first point about the interface's appearance (visual) gets an average score of 4, which falls into the "Good" category. This shows that the application's overall appearance is quite attractive to respondents, although it still has shortcomings that need to be improved.

2. Second Assessment Point

The second point about "Ease of Use of Application" *(user friendly) received an average score of 3.6,* which is included in the "Good" category. This shows that the respondents have no difficulty operating the application and are easy to understand.

3. Third Rating Point

The third point, "Application Speed of Processing Data" (process), received an average score of 4.1, which is included in the "Very Good" category. Most respondents agree that the application's calculation process is fast and responsive. However, further optimization is needed.

4. Fourth rating point

The fourth point, "Accuracy of Results" (Result), received an average score of 3.7, which is included in the "Good" category. This shows that most respondents consider the application to provide accurate results, although the application still needs further development.

Conclusion

The results of the design and testing of the system can be concluded as follows: The system created can help the company's management in determining the best employees more objectively, the Analytic Hierarchy Process (AHP) method is more suitable for use in the decision support system for selecting the best employees at the Teacher Professional Education Agency, State University of Surabaya, which refers to the highest calculation results at 100% precision. recall 84%, accuracy 84% and F1-score 91%. The results of the respondent's assessment of the application had a percentage of display assessment category of 4, ease of use of 3.6, process speed of 4.1, and accuracy of results of 3.7, so it can be concluded that the respondents can accept the application.

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