Jurnal JTIK (Jurnal Teknologi Informasi dan Komunikasi)

Journal Homepage: http://journal.lembagakita.org/index.php/jtik

Application of Simple Additive Weighting (SAW) Method in Determining Employee Bonus (Case Study: PT. Wana Anugrah Albasindo)

Regina Putri Wanda Zahirah [1], Nadia Ayu Isroh Maniar [2], Ade Prasetyo [3], Yohani Setiya Rafika Nur [4*]

[1,2,3,4*] *Informatics Engineering Study Program, Faculty of Informatics, Institut Teknologi Telkom Purwokerto, Banyumas Regency, Central Java Province, Indonesia.*

a r t i c l e i n f o

Article history:
Received 31 July 2023
Received in revised form
1 November 2023
Accepted 10 December 2023
Available *online* January 2024

DOI:
https://doi.org/10.35870/jtik.v8i1.1450.

Keywords:
Decision Support System; SAW; Bonus; Employee.

Kata Kunci:
Sistem Pendukung Keputusan; SAW; Bonus; Karyawan.

a b s t r a c t

The agency will provide a salary as compensation for an employee's work. In addition to providing a basic wage, each agency often provides salary bonuses however, PT. Wana Anugrah Albasindo has difficulty distributing rewards to employees based on the performance of their employees, so decision support is needed based on the performance of each employee. The research data used criteria such as Presence, Number of Overtime Hours, and Length of Work. Based on the results and discussion of this research, it can be concluded that the application of determining employee bonuses with the SAW method is beneficial for PT. Wana Anugrah Albasindo is more transparent in deciding employee bonuses at PT. Wana Anugrah Albasindo determines the weight value of each assessment criterion in the form of attendance with a percentage of 50%, the number of overtime hours at 30%, and the length of work at 20%.

a b s t r a k

Instansi akan memberikan gaji sebagai kompensasi dari kerja seorang karyawannya. Disamping pemberian gaji pokok, setiap instansi seringkali memberikan bonus gaji. Namun, PT. Wana Anugrah Albasindo memiliki kesulitan dalam membagi bonus kepada karyawan berdasarkan kinerja karyawannya, sehingga dibutuhkan pendukung keputusan berdasarkan kinerja dari setiap karyawan. Data penelitian menggunakan kriteria seperti Presensi, Jumlah Jam Lembur, Lama Bekerja. Berdasarkan dari hasil dan pembahasan penelitian ini maka dapat disimpulkan, bahwa penerapan untuk menetapkan bonus karyawan dengan metode SAW sangat membantu pihak PT. Wana Anugrah Albasindo secara lebih transparan dalam menentukan bonus bagi karyawan di PT. Wana Anugrah Albasindo yaitu dengan menentukan nilai bobot dari tiap kriteria penilaian berupa presensi dengan presentase 50%, jumlah jam lembur 30%, dan lama bekerja 20%.

Corresponding Author. Email: yohani@ittelkom-pwt.ac.id [4].

ACM Computing Classification System (CCS)
EBSCOhost
Communication and Mass Media Complete (CMMC)

1. Introduction

PT. Wana Anugrah Albasindo is a company in wood processing (plywood) located at Jl. Banyumas Kemranj, Karangbajing, Kejawar, Banyumas District, Banyumas Regency, Central Java 53192. Every company, agency, organization, or business entity will pay a salary for an employee's work. In addition to providing a basic wage to its employees, each agency often provides a salary bonus and basic pay to spur the performance and productivity of its employees' work [1]. Employees in a company are the most essential element. Employees are one of the main factors in a company's smoothness, progress, and success [2]. Many companies appreciate their employees; this can motivate employees to improve their work performance [2]. Offering bonuses is a strategy many companies use to reward employees who have worked hard and satisfied the company—however, PT. Wana Anugrah Albasindo still needs help distributing employee bonuses based on employee performance. A calculation is required that can provide the ranking based on the performance of each employee, one of which is implementing a Decision Support System (DSS).

Decision Support System (DSS) is an interactive computer-based system that helps decision-makers use data and various models to solve unstructured problems [3]. A decision support system (DSS) is an approach that supports decision-making. DSS uses a flexible, interactive, and adaptable Computer Information System (CBIS) developed to support solutions to specific, unstructured management problems [4]. Several previous studies relating to the determination of employee bonuses have been conducted. Research conducted by Muhammad Sahdan, Muhammad Innudin, and Mokhammad Nurkholis Abdillah (2020) [5], this research applies an employee bonus decision support system with the Fuzzy-SAW method. Employee bonuses at PT Bunga Raya are determined based on attendance, salary, cooperation, discipline, and overtime. The problem is due to the need for more transparency in deciding employee bonuses, which impacts the harmonious relationship of employees at work, so a new system is needed to support and facilitate the ranking process to improve the quality of decisions in determining employee bonuses. To overcome this problem, a method is required that can assist the administration in speeding up and simplifying the process of ranking employee bonuses. Another research was conducted by Safrizal and Panji Jaya Komara (2021) regarding decision support for the provision of annual bonuses for employees at PT. Mega Fortris Indonesia uses the Simple Additive Weighting (SAW) method to assess the decision support system at PT. Mega Fortris Indonesia consists of several criteria, including absenteeism with a weight of 20%, working period with a weight of 15%, work results with a weight of 25%, attitude of 20%, quality with a weight of 25%, and a total weight of 100%. The results obtained show that the rank value above 85 gets a bonus of 3 months' salary, ranks from 70 -80 get a bonus of 2 months' salary; ranks 50-69 get a bonus of 1 month's salary; below 50 do not get a bonus [6].

Research by Yulisman and Refni Wahyuni (2021) related to the selection of employee bonuses using the SAW method at PT. Pomegranate Prosperous Aceh Singkil. The company's determination each year is still done manually and assisted by number and letter processing applications so that the calculation results of employees who receive bonuses often need to match the criteria and performance of these employees. The results of bonus calculations usually affect the personal relationship between employees and managers or superiors. Based on these problems, the SPK system can provide transparent assessments and measures in determining employee bonuses [7]. Research by Mutaqqin et al (2023) is related to the design of a system for making decisions on determining employee salaries and bonuses at PT. One Jos Group. Other problems it faces include more integration between attendance, payroll, and employee appraisals, making it difficult to determine proper employee bonuses and benefits. Based on these problems, an integrated and data-based system, the decision-making process related to bonuses and benefits can be carried out more efficiently [8]

Based on the above background, the author conducted research entitled Decision Support System for Determining Employee Bonus Using Web-Based Simple Additive Weighting Method (Case Study: PT. Wana Anugrah Albasindo). The simple additive weighting (SAW) method was chosen. After all, it has advantages in making assessments more precise because it is based on predetermined criteria and

preference weights. SAW can also select the best alternative from several existing options because of the ranking process after determining the weight for each attribute [9]. In decision-making involving many criteria, a suitable method is needed to process multi-criteria data [10].

2. Methods

Research Stages

This stage explains research in general. Some of the stages of research that will be carried out are identifying problems, the next stage is collecting data, the results of the data that have been collected, the next stage is conducting data analysis using the SAW method, then the design and implementing of the system is carrieThis section outlines the overall research process. Initially, the research will focus on identifying the problems to be addressed. Following this, data collection will take place. Once data has been gathered, it will be analyzed using the SAW method. Subsequently, the system's design and implementation will be carried out. The final step involves conducting functional tests on the developed system. A diagram illustrating these steps is presented in Figure 1.d out and the final stage is conducting functional testing of the system that has been made. The following steps are represented in a diagram that can be seen in Figure 1:

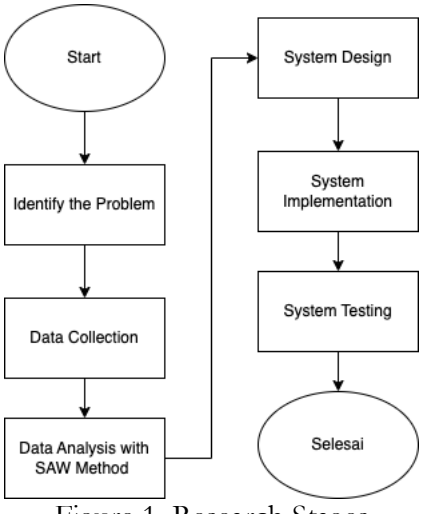

Figure 1. Research Stages

Figure 1 above shows the research flow to build a decision support system to be made. The stages consist of:

Identifying the Issue

The first phase of this study focuses on identifying the issue to be investigated. From the context provided, it becomes clear that employing the Simple Additive Weighting (SAW) method for assigning employee bonuses at PT. Wana Anugrah Albasindo is essential.

Gathering Data

This study collects data on employees, which includes their names, departments, attendance records, overtime hours, and tenure. The gathering of data is achieved through a combination of interviews and review of relevant academic journals. Interviews with the management of PT. Wana Anugrah Albasindo were conducted to gather this data. Additionally, the criteria for evaluating employees, such as tenure, attendance, and performance, were also derived from academic journal reviews [11].

Analyzing Data with the SAW Method

The Simple Additive Weighting (SAW) method, a technique of adding weights, is utilized in this study. The essence of the SAW method is to calculate a weighted average of performance scores for each option across various criteria. The SAW method was chosen for this research because it is recognized as a popular and frequently applied approach in handling decisions that involve multiple attributes [12]. It necessitates the normalization of the decision matrix (X) so that the ratings of all possible options can be compared on a uniform scale [13]. Decision-makers are required to assign a weight to each criterion. The overall score for an option is calculated by adding up the products of the ratings and weights for each criterion [14]. The procedure of the SAW method is depicted in Figure 2.The initial stage of this research is problem identification, which aims to determine the problem to be studied. Based on the background discussed, applying the Simple Additive Weighting (SAW) method to determine employee bonuses at PT is necessary. Wana Anugrah Albasindo.

Data Collection

This researcher uses employee data consisting of name, field, attendance, overtime hours, and length of work. The data collection method uses two techniques, namely interviews and literature studies from relevant journals. The data was obtained by conducting interviews with the owners of PT. Wana Anugrah Albasindo. In determining the components

of assessment in assessing employees such as length of work, attendance, performance also consider from the study of journal literature [11].

Data Analysis using the SAW Method

The Simple Additive Weighting (SAW) method is a weighted addition method. The basic concept of the SAW method is to find the weighted sum of performance ratings on each alternative across all attributes. This research uses the SAW method because this method is the most famous and most widely used method in dealing with and solving situations with Multiple Attribute Decision Making criteria [12]. The SAW method requires normalizing the decision matrix (X) to a scale that can be compared with all available alternative ratings [13]. The SAW method requires decision-makers to determine the weight for each attribute. The total score for an alternative is obtained by summing all the multiplication results between the rating and weight of each feature [14]. Here is the flow chart of the SAW method in Figure 2:

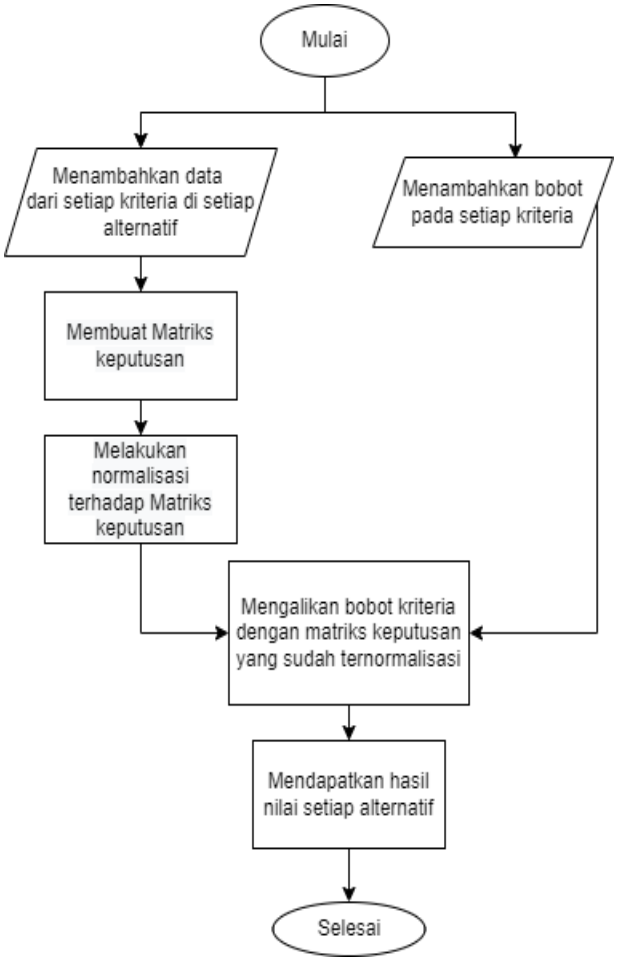

Figure 2. SAW Method Algorithm [15]

SAW method calculation steps:

1) Determining Alternatives (Ai)
2) Determine the criteria that will be used as a reference in decision making (Cj)
3) Determine the preference weight or importance level (W) of each criterion
4) Determine the Match Value of each criterion
5) Create a decision matrix (X) derived from the match rating for each alternative (Ai) with every criterion (Cj).
6) Perform the decision matrix normalization step (X) by calculating the normalized performance rating value (r_{ij}) from alternatives (Ai) on criteria (Cj) with equations 1 and 2:

Where j is the profit attribute or benefit:

$$r_{ij} = \left\{\frac{x_{ij}}{max_i\ x_{ij}}\right\} \quad (1)$$

Where j is the cost attribute:

$$r_{ij} = \left\{\frac{min_i\ x_{ij}}{x_{ij}}\right\} \quad (2)$$

Results of normalization (r_{ij}) form a normalized matrix (R) with equation 3:

$$R = \begin{bmatrix} r11 & r12 & \dots & r1j \\ \vdots & & & \vdots \\ ri1 & ri2 & \dots & r2j \end{bmatrix} \quad (3)$$

The final result of the preference value (V_i) obtained from the sum of the multiplication of the normalized matrix row element (R) by the preference weight (W) corresponding to the matrix column element (W) with equation 4:

$$V_1 = \sum_{j=1}^{n} w_j r_{ij} \quad (4)$$

7) Perform ranking.

1) System design
   System design will use diagrams in *Unified Modelling Language* (UML).
2) System implementation
   The model obtained at the data analysis stage with the SAW method will be implemented into the R-Shiny framework.

3) System testing
The final stage is testing the system that has been created using Blackbox Testing. The purpose of this test is to see whether the overall functionality of the system is appropriate.

3. Results and Analysis

Research Data

Interviews were conducteInterviews were held in a question-and-answer format with the proprietors of PT Wana Anugrah Albasindo, during which data was gathered. The outcomes of the comprehensive data collection are displayed in Table 1.d in the form of questions and answers with the owners of PT, who collected data. Wana Anugrah Albasindo. The results of detailed data collection can be seen in Table 1:

Table 1. Employee Data

No	Name	Section	Day	Overtime Hours	Length of work
1	Dariyah	Repair	7.5	6	1 year 3 months
2	Vio	Repair	9	7,5	1 year 2 months
3	Setyaningsih	Repair	8	5	1 year 2 months
4	Ani	Repair	7.5	3.5	7 months
5	Muria	Repair	9	7	6 months
6	Sri	Repair	5.5	7	1 month

The employee data will be used as an alternative in the calculation method which can be seen in table 2:

Table 2. Employee Data (Alternative)

No	Alternative Code	Employee name
1	A1	Dariyah
2	A2	Vio
3	A3	Setyaningsih
4	A4	Ani
5	A5	Muria
6	A6	Sri

Data Analysis with SAW Method

Solving problems for determining employee bonuses using the Simple Additive Weighting (SAW) method, the results of the initial stepdetermine the criteria that will be used as a reference in decision making, namely C_i. There are 3 assessment criteria used by companies to determine employee bonuses which are seen in tables 3 to 5 below:

Table 3. Attendance Criteria (C1)

No	Attendance	Value
1	≤ 85%	5
2	70% - 85%	3
3	≥ 70%	1

Table 4. Criteria for Number of Overtime Hours (C2)

No	Number of Overtime Hours	Value
1	≤ 5 hour	5
2	3 – 5 hour	3
3	≥ 3 hour	1

Table 5. Working Time (C3)

No	Length of Work	Value
1	≤ 1 Year	5
2	6 Months – 1 Year	3
3	≥ 6 Months	1

Based on tables 2 to 4, there are three criteria such as Attendance criteria (C1), Number of Overtime Hours (C2), Length of Work (C3) with each criterion having its own importance value. After getting the criteria used, the weights against the three criteria can be seen in table 6:

Table 6. Criteria Weights

Criteria Code	Criteria Name	Kind	Weight Value
C1	Attendance	Benefits	0.5
C2	Number of Overtime Hours	Benefits	0.3
C3	Length of Work	Benefits	0.2

In table 5, that three are used Attendance criteria (C1); Number of Overtime Hours (C2); length of work (C3); Included in the type of benefit or benefit by having a weighted value based on a percentage of 50%; 30%; 20%. Furthermore, in the settlement process, there are 6 employees who are alternative samples to receive employee bonuses, from these alternatives can be assessed employees from existing

criteria, seen in the following table 7:

Table 7. Per-Criteria Employee Assessment

Alternative	Criterion		
	C1	C2	C3
A1	47%	6 hour	1 year 3 months
A2	57%	7.5 hour	1 year 2 months
A3	50%	5 hour	1 year 2 months
A4	47%	3.5 hour	7 months
A5	57%	7 hour	6 months
A6	35%	7 hour	1 month

After conducting an employee appraisal, the decision matrix process continues the employee appraisal table. The results are in table 8 below:

Table 8. Decision Matrix

Alternative	Criterion		
	C1	C2	C3
A1	1	5	5
A2	1	5	5
A3	1	5	5
A4	1	3	3
A5	1	5	3
A6	1	5	1

The following action involves creating a normalized matrix based on the match rating outcomes utilizing the SWew technique. Should the criteria attributes be classified as benefit, then the matrix's elements are each divided by the highest value within their respective criterion. Conversely, for attributes identified as cost, the smallest value in the matrix column is divided by every matrix element.

Table 9. Normalization

Alternative	Criterion		
	C1	C2	C3
A1	1	1	1
A2	1	1	1
A3	1	1	1
A4	1	0.6	0.6
A5	1	1	0.6
A6	1	1	0.2

Based on table 9 above, the results of matrix normalization between alternatives and criteria in the selection of employee bonuses. After getting the normalization results, the next stage is to rank which can be seen in table 10.

Table 10. Multiplication of weights and matrices

Alternative	Criterion			Sum
	C1	C2	C3	
A1	0.5	0.3	0.2	1
A2	0.5	0.3	0.2	1
A3	0.5	0.3	0.2	1
A4	0.5	0.18	0.12	0.80
A5	0.5	0.3	0.12	0.92
A6	0.5	0.3	0.04	0.84

After obtaining the results of the multiplication of weights and the matrix in table 10, the next step is determining the order of employee bonus ratings. The results can be seen in the following table which can be seen in table 11.

Table 11. Ranking Results

Alternative	Criterion			Sum	Rank
	C1	C2	C3		
A1	0.5	0.3	0.2	1	1
A2	0.5	0.3	0.2	1	2
A3	0.5	0.3	0.2	1	3
A4	0.5	0.3	0.12	0.92	4
A5	0.5	0.3	0.04	0.84	5
A6	0.5	0.18	0.12	0.80	6

Based on the ranking results that have been obtained in table 8, the ranks 1 to 6, so that those who are entitled to get bonuses at ranks 1 to 3 are Dariyah (A1), Vio (A2), and Setyaningsih (A3) with a value of 1. In ranks 4 to 6, namely Muria (A4) with a value of 0.92, Sri (A5) with a value of 0.84, Ani (A6) with a value of 0.80.

System Design

The system design in this study uses *Unified Modelling Language* (UML). Designing using UML makes it easy to provide an overview of the system flow to users because it can model object-oriented systems The diagram used *uses usecase* and *activity diagrams*, which can be seen in the Figure 3

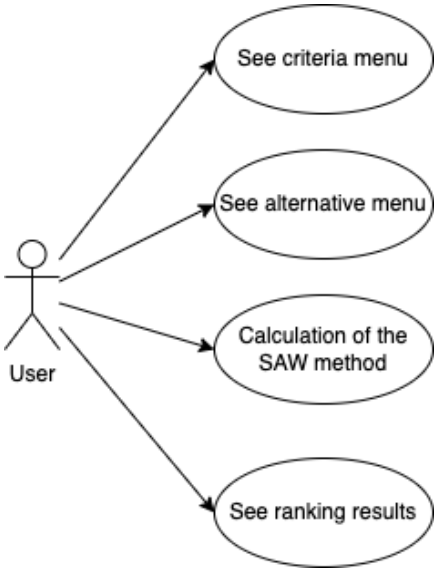

Figure 3. *Usecase* Diagram

Figure 3 represents an overview of the features that users can perform in the decision support system for determining employee bonuses. The use case consists of users or users, see the criteria menu, see the alternative menu, SAW method calculations, and finally, the feature ranking results.

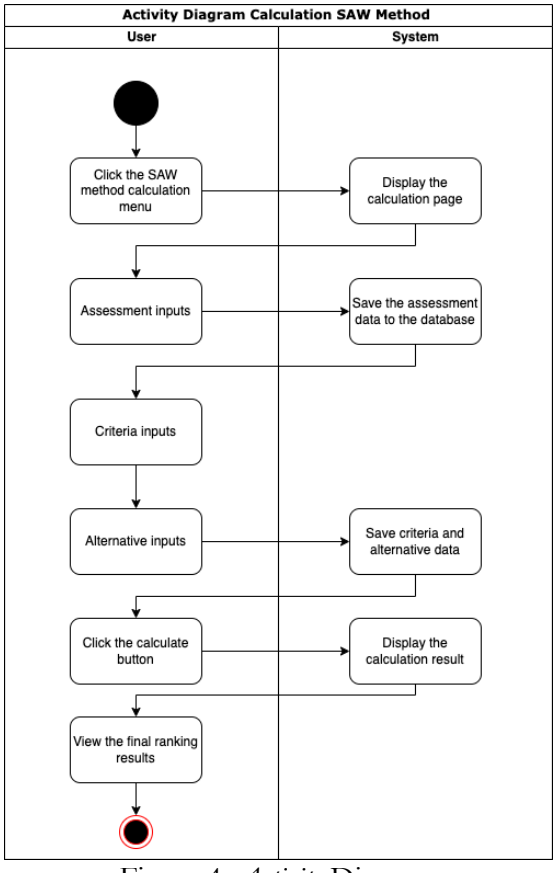

Figure 4. *Activity* Diagram

Figure 4 represents the activities of users or users when operating a decision support system for determining employee bonuses.

System Implementation Output Results

Implementing the program in this study aims to apply problems in determining the selection of employee bonuses into the decision support system. This system is used by applying the SAW method to calculate decisions. The criteria page (Figure 5) presents the components of the criteria and alternatives used as consideration for the selection of employee candidates:

Data Alternatif

No	Kode Alternatif	Nama Karyawan
1	A1	Dariyah
2	A2	Vio
3	A3	Setyaningsih
4	A4	Ani
5	A5	Muria
6	A6	Sri

Data Kriteria

No	Kode Alternatif	Nama Kriteria
1	C1	Presensi
2	C2	Jumlah Jam Lembur
3	C3	Lama Bekerja

Sistem Pendukung Keputusan
PT. Wana Anugrah Albasindo

Figure 5. Alternate Page Interfaces and Criteria

The ranking page is the crowning glory of the decision support system, and Figure 6 showcases the incredible results of using the Simple Additive Weighting (SAW) method. By displaying each employee's unique code, name, performance appraisal, and final ranking, the ranking page serves as the ultimate decision-making tool. Not only does it provide a complete overview of the final ranking results, but it also offers a comprehensive evaluation of each employee's performance against the set criteria. The SAW method has ensured a fair and transparent assessment process, making it easier for stakeholders to make informed decisions based on calculated and unbiased rankings. Figure 6 is a testament to the systematic approach employed by the decision support system, and it proves invaluable in aiding stakeholders to make fair and impartial decisions.

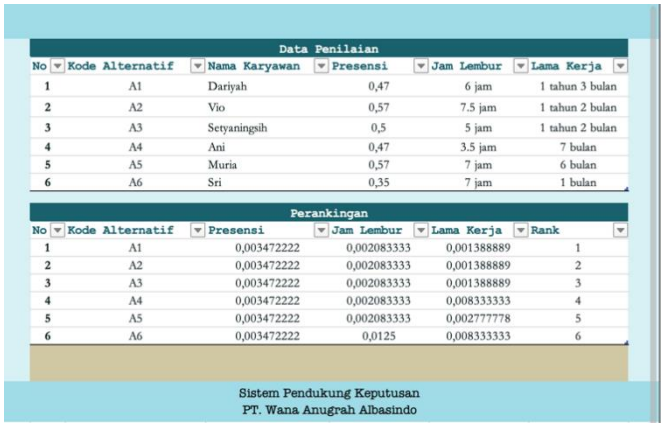

Figure 6. Decision Making Page Interface

System Testing

In the final stage of this research, namely, system testing using *black box testing* from the user side to see the functional system. The test has functioned and runs by its functionality (*valid*) according to what is done by the user. Testing is done by giving five test points according to the number of menus in the system (Table 12).

Table 12. Black Box Results

No	Test Scenarios	Test Results	Conclusion
1	The alternative menu contains what alternative data will be used then click the save button to save the alternative data	The system will perform alternative data storage processes	Valid
2	The assessment menu is filled with employee assessment data, then click the save button to save the assessment data	The system will carry out the process of storing data that has been inputted	Valid
3	The criteria menu is filled with criteria data and then click the save button to save the criteria data	The system will perform the data storage process Criteria that have been inputted	Valid
4	SAW Calculation menu contains the weight of each criterion and the weight of each alternative based on the data that has been inputted	The system will carry out the calculation process and bring up the results of the decision	Valid
5	Ranking menu which contains all calculation results obtained from SAW calculations	The system will display the ranking results	Valid

4. Conclusion

Based on the results and discussion of this research, the application of determining employee bonuses with the SAW method is beneficial for PT. Wana Anugrah Albasindo is more transparent in deciding employee bonuses at PT. Wana Anugrah Albasindo determines the weight value of each assessment criterion in the form of attendance with a percentage of 50%, the number of overtime hours at 30%, and the length of work at 20%. Based on the results of six employees, they have been ranked 1 to 3, so those entitled to bonuses are Dariyah, Vio, and Setyaningsih. The system in this study also has valid functionality or functions by the desired output.

5. References

[1] Manurung, N., 2017. Sistem Pendukung Keputusan Pemberian Bonus Karyawan Menggunakan Metode Ahp. *(JurTI) Jurnal Teknologi Informasi*, *1*(1), pp.48-53.

[2] Stevanus, R., Handayani, R.I. and Kristiyanti, D.A., 2018. Sistem Pendukung Keputusan Pemberian Bonus Karyawan Menggunakan Metode Ahp Pada Rumah Sakit Buah Hati Ciputat. *Jurnal Pilar Nusa Mandiri*, *14*(2), pp.267-274. DOI: https://doi.org/10.33480/pilar.v14i2.78.

[3] Apandi, S., Veza, O., Majid, S. and Panessai, I.Y., 2020. Determination of Employee Bonuses Using the Analytic Network Process Method at PT. Global Harvest Precision Engineering. *Journal of Engineering, Technology, and Applied Science (JETAS)*, *2*(1), pp.51-58. DOI: https://doi.org/10.36079/lamintang.jetas-0201.94.

[4] Pungkasanti, P.T. and Handayani, T., 2017. Penerapan analytic network process (ANP) pada sistem pendukung keputusan. *Jurnal Transformatika*, *14*(2), pp.66-71. DOI: http://dx.doi.org/10.26623/transformatika.v14i2.437.

[5] Sahdan, M., Innuddin, M. and Abdillah, M.N., 2020. Sistem Pendukung Keputusan Penentuan Bonus Karyawan dengan Metode Fuzzy-SAW Berbasis Web (Studi Kasus PT. Bunga Raya). *Informatics and Digital Expert (INDEX)*, *2*(2). DOI: https://doi.org/10.36423/index.v2i02.586.

[6] Irawan, Y., 2020. Decision support system for employee bonus determination with web-based simple additive weighting (SAW) method in PT. Mayatama Solusindo. *Journal of Applied Engineering and Technological Science (JAETS)*, *2*(1), pp.7-13. DOI: https://doi.org/10.37385/jaets.v2i1.162.

[7] Yulisman, Y. and Wahyuni, R., 2021. Sistem Pendukung Keputusan Penentuan Bonus Karyawan Dengan Metode SAW Pada PT. Delima Makmur Aceh Singkil. *JTIM: Jurnal Teknologi Informasi Dan Multimedia*, *3*(2), pp.78-90. DOI: https://doi.org/10.35746/jtim.v3i2.154.

[8] Muttaqin, I.N., Sanjaya, A. and Utomo, W.C., 2023, July. Rancang Bangun Sistem Pendukung Keputusan Penentuan Gaji Dan Bonus Karyawan. In *Prosiding SEMNAS INOTEK (Seminar Nasional Inovasi Teknologi)* (Vol. 7, No. 3, pp. 1091-1098). https://doi.org/10.29407/inotek.v7i3.3541.

[9] Trisnawati, T., Puastuti, D. and Sholeha, L., 2020. Pemilihan media pembelajaran terbaik sebagai sarana pembelajaran yang efektif menggunakan metode SAW. *Jurnal Penelitian Ilmu Pendidikan*, *13*(1), pp.72-84. DOI: http://dx.doi.org/10.21831/jpipfip.v13i1.30474.

[10] Tou, N., Endraswari, P.M. and Nur, Y.S.R., 2023. Pemilihan Mahasiswa Berprestasi Menggunakan Algoritma AHP (Studi Kasus: Fakultas Teknik UBB). *JIKA (Jurnal Informatika)*, *7*(1), pp.46-53. DOI: http://dx.doi.org/10.31000/jika.v7i1.7129.

[11] Sihotang, F.P., 2021. Implementasi Metode Weighted Product (WP) pada Sistem Pendukung Keputusan Pemberian Bonus Karyawan. *JATISI (Jurnal Teknik Informatika dan Sistem Informasi)*, *8*(4), pp.2158-2170. DOI: https://doi.org/10.35957/jatisi.v8i4.1179.

[12] Safrizal., Komara, P.W., 2020. Sistem Pendukung Keputusan Pemberian Bonus Tahunan Karyawan Dengan Metode Simple Additive Weighting (SAW). *Jurnal Satya Informatika*, *5*(01), pp.53-64. DOI: https://doi.org/10.59134/jsk.v5i01.45.

[13] Manullang, M.A. and Fahmi, H., 2021. Sistem Pendukung Keputusan Pemberian Kredit Sepeda Motor Pada PT Adira Finance Medan Menggunakan Metode SAW. *Jurnal Nasional Komputasi dan Teknologi Informasi*, *4*(2). pp. 143–148.

[14] Ramadhan, M.R., Nizam, M.K. and Mesran, M., 2021. Penerapan Metode SAW (Simple Additive Weighting) Dalam Pemilihan Siswa-Siswi Berprestasi Pada Sekolah SMK Swasta Mustafa. *TIN: Terapan Informatika Nusantara*, *1*(9), pp.459-471.

[15] Juansen, M., Defit, S. and Sumijan, S., 2020. Akurasi Penjurusan Bidang Keahlian Teknik Komputer dan Informatika Menggunakan Metode SAW. *Jurnal Sistim Informasi dan Teknologi*, pp.77-83. DOI: https://doi.org/10.37034/jsisfotek.v2i3.26.