Nusantara Journal of Artificial Intelligence and Information Systems
Vol. 1, No. 1, June 2025, pp 1-12 journal homepage: https://journal.unusia.ac.id/nuai
Research Article ISSN: XXXX-XXXX DOI: 10.47776/nuai.v1i1.1590

Decision Support Systems for Determining the Best Santri at PPTQ Al Kaukab using Simple Additive Weighting Method

I Putu Deny Arthawan Sugih Prabowo[1*], Hana Mufidianingsih[2], Mohammad Reza Fahlevi[3]
[1] Department of Information Systems, Institut Teknologi Kalimantan, Balikpapan, Indonesia
[2] Department of Information Systems, Universitas Nahdlatul Ulama Indonesia, Jakarta, Indonesia
[3] Department of Informatics Engineering, Universitas Nahdlatul Ulama Indonesia, Jakarta, Indonesia

[1]putudeny.asp@lecturer.itk.ac.id, [2]hannamufidia79@gmail.com, and [3]rezafah@unusia.ac.id

INFORMATION

Article history:

Received March 14, 2025
Revised April 22, 2025
Accepted April 29, 2025

Keywords:

DSS,
SAW,
Santri,
Pesantren.

ABSTRACT

A Decision Support System (DSS) is a tool developed to aid in making decisions that are more accurate, efficient, and well-organized, particularly when assessing several options using multiple criteria. This research designed a Decision Support System (DSS) utilizing the Simple Additive Weighting (SAW) method to identify the top-performing santri at PPTQ Al Kaukab. The purpose of the system is to enhance educational quality by objectively selecting exceptional students for acknowledgment**.** The assessment was based on seven weighted criteria, including attitude, attendance, academic performance, and rule violations. Data were collected from seven selected santri, and each was scored and normalized before being processed using the SAW method. The final ranking showed that A3 (Muhda Lutfa Azizah) achieved the highest score of 0.803, followed by A1 (Unifah) with 0.791, and A5 (Tasa) with 0.686. These results indicate that the SAW method is effective in delivering accurate, fair, and transparent recommendations, making it a reliable approach for structured decision-making in pesantren environments.

To cite this article:

Prabowo, I. P. D. A. S., Mufidianingsih, H., & Fahlevi, M. R. (2025). Decision Support Systems for Determining the Best Santri at PPTQ Al Kaukab using Simple Additive Weighting Method. Nusantara Journal of Artificial Intelligence and Information Systems, 1(1), 1-10. https://doi.org/10.47776/nuai.v1i1.1590

****Corresponding Author:***

I Putu Deny Arthawan Sugih Prabowo
Department of Information Systems, Kalimantan Institute of Technology
Jl. Soekarno Hatta No.KM 15, Karang Joang, Balikpapan, East Kalimantan (76127)
Email: putudeny.asp@lecturer.itk.ac.id

1. INTRODUCTION

The rapid development of the internet and information systems has become a basic necessity for modern society. Various institutions increasingly rely on technology to address a wide range of problems, including in the field of education. In Islamic boarding schools (*pesantren*), operational activities now require speed and precision to maintain the quality of education and service to the community. Therefore, a Decision Support System (DSS) is needed to help make accurate, efficient, and objective decisions [1].

Decision-making is a process that involves collecting data, evaluating alternative options, and taking action based on the best possible choice. Web-based DSS have become a popular solution across many sectors due to their ability to simplify complex decisions. One of the most widely used methods in DSS is the Simple Additive Weighting (SAW) method. SAW works by calculating the weighted sum of performance ratings across various criteria, making it effective for structured decision-making. It allows for straightforward determination of criterion weights and produces results that are easy to interpret. However, SAW has limitations, such as subjectivity in assigning weights, which can influence the final outcome [2].

Previous studies have explored various DSS techniques such as MOORA and AHP for selecting top employees or teaching staff. However, these methods have drawbacks such as computational complexity (MOORA) or sensitivity to inconsistency in pairwise comparisons (AHP), making them less practical for certain environments[3][4]. In contrast, the SAW method offers a simpler and more adaptable approach, especially for situations that require fast, transparent, and data-driven decision-making [5].

At PPTQ Al Kaukab, a *pesantren* located in Bojongnangka Village, Gunung Putri District, Bogor Regency, the selection of outstanding students (*santri*) is still conducted manually. Evaluations are largely based on subjective discussions among teachers and administrators, without the support of structured data. This leads to several issues, such as potential bias, inconsistent standards, and lack of transparency or traceability in the assessment process. Moreover, the assessment at PPTQ Al Kaukab does not focus solely on academic performance but also includes religious obligations (ubudiyah), discipline, attendance in study groups (*halaqah*), and conduct within the dormitory environment.

These challenges highlight the need for a decision-making tool that can evaluate multiple aspects fairly and transparently[6]. The SAW method is considered highly relevant for this context because it can accommodate both quantitative and qualitative criteria, and allows for a structured, objective, and efficient selection process[7]. Therefore, this study aims to design and implement a decision support system using the SAW method to assist PPTQ Al Kaukab in selecting the best students in a fair and systematic manner.

2. LITERATURE REVIEW

A Decision Support System (DSS) is composed of interconnected subsystems designed to assist in solving complex decision-making problems. The accuracy and efficiency of DSS operations can be significantly improved through the integration of computerized systems. At PPTQ Al Kaukab in Bojongnangka, the current method for selecting the best *santri* (students) remains manual, relying heavily on discussions and subjective evaluations by educators. This traditional approach often leads to biased outcomes, as it lacks standardized and measurable data to support fair assessment[8] .

The Simple Additive Weighting (SAW) method offers an effective solution for such challenges by providing a systematic approach to multi-criteria evaluation. It operates by calculating the weighted sum of normalized scores for each alternative across multiple attributes. This method enables assessments that are both objective and adaptable to institutional preferences, making it suitable for structured decision-making processes.

In the digital era, the role of computerized decision-making systems has become increasingly vital[9]. Ranking students based on various performance metrics is a key strategy in educational quality assurance. Previous studies have highlighted core processes in ranking systems, such as data collection, weighting, normalization, and final scoring. SAW has gained prominence as a Multi-Criteria Decision-Making (MCDM) method due to its simplicity and clarity in representing decision outcomes [10][11].

In educational contexts, SAW has been applied successfully in multiple studies[12]. For example a previous study demonstrated its effectiveness in selecting top students based on a combination of academic and behavioral criteria. Another study [13] implemented SAW in a DSS to determine the best *santri* at Pondok Pesantren Al-Washilah, showcasing its ability to support transparent and consistent evaluations through predefined weighted criteria.

The present study also adopts assessment criteria tailored through interviews with key stakeholders, resulting in seven evaluation aspects: attitude, security violation points, *ubudiyah* (religious activity) attendance, *halaqah* (study group) attendance, boarding school report cards, formal school report cards, and language violation points. These criteria reflect both academic and non-academic dimensions important to *pesantren* education.

Various DSS methodologies have been explored in previous research. For instance, a Smart Assessment System utilizing the MOORA method was developed to support teacher selection at LKP Andalusia [14]. Although MOORA offers a robust and stable evaluation framework, it involves complex calculations in both weight assignment and data processing, which can be challenging for users without technical expertise.

Similarly, the Analytical Hierarchy Process (AHP) has been used in corporate environments to determine salary allowances[15]. While AHP allows for detailed hierarchical evaluation, it is sensitive to inconsistencies in judgment and requires complete recomputation when revisions are needed, reducing its scalability and practicality.

Table 1. Research comparison

Methods	Disadvantages	Advantages
MOORA .	Complex weight and data computation.	Simple, stable, robust
AHP	Sensitive to inconsistency; time-consuming revisions	Handles hierarchical decision structures
SAW	Subjectivity in weight assignment.	Transparent and easy-to-implement evaluation based on fixed criteria weights

Despite each method's respective strengths, previous studies have often lacked a thorough discussion on their limitations in practical implementation especially in the educational sector. This study addresses this gap by choosing SAW for its balanced combination of clarity, ease of use, and adaptability to educational assessment needs. Based on these considerations, the SAW method is chosen in this study as the most suitable approach for structured and efficient decision-making, especially in identifying top-performing *santri*. The final score for each student is calculated by summing the products of normalized scores and assigned weights for each criterion, resulting in an assessment that is fair, objective, and aligned with institutional priorities.

3. METHOD

The methodology employed in the Decision Support System (DSS) for selecting the best *santri* at PPTQ Al Kaukab using the Simple Additive Weighting (SAW) method begins with gathering evaluation criteria through interviews with stakeholders, including teachers and administrators) [16]. The data collection was conducted over the course of the 2023-2024 academic year, ensuring that all student performance could be evaluated consistently. A purposive sampling technique was applied, involving the selection of seven outstanding *santri* recommended by teachers and *pesantren* administrators based on observed academic and non-academic achievements[17]. To ensure data accuracy, all information was cross-verified using official academic reports, teacher observations, and structured interviews with relevant staff members.

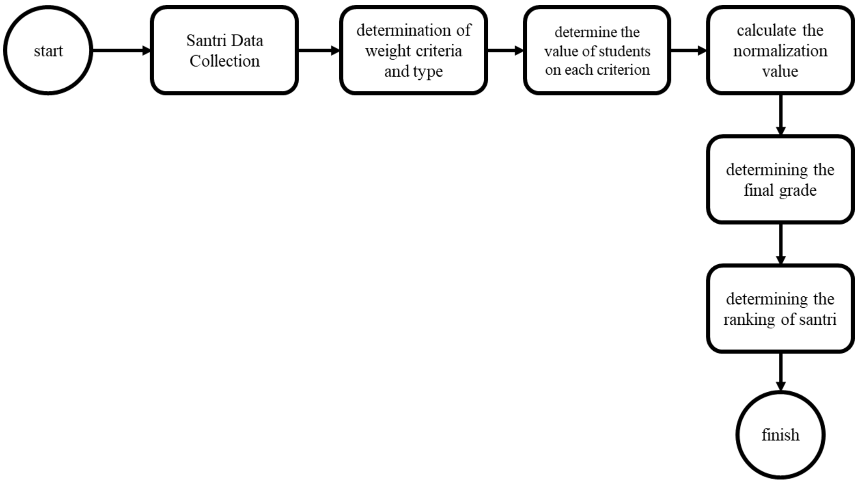

Figure 1. Stages of saw decision-making method

3.1. Santri Data Collection

At this stage, data from each student is systematically collected and evaluated based on predetermined criteria, covering various important aspects such as academic performance, disciplinary records, participation in extracurricular activities, as well as other relevant factors for determining the quality and achievement of a student. A good evaluation should consider a variety of valid and reliable data sources to ensure the accuracy of the assessment results[18]. Therefore, in this system, every element of information is collected through a structured method, either through academic reports, direct observation, or interviews with related parties such as teachers or mentors. With this thorough data collection and analysis process, the system can provide a more objective evaluation of each student, ensuring that the assessment results obtained truly reflect their overall abilities and potential. This is important to ensure that each student receives appreciation and development in accordance with their respective capabilities. A data-driven approach to evaluation allows for a more objective and comprehensive analysis, which not only assesses academic achievement, but also takes into account non-academic aspects such as ethics, leadership, and contributions to the *pesantren* community [19].

3.2. Determination of Weight Criteria and Type

The second step in the Simple Additive Weighting (SAW) method involves determining the weight and type of each criterion to be used in the evaluation process. The weight assigned to each criterion reflects its relative importance, which is derived from interviews with the *Mudir* of the *Pesantren* and *Madrasah*. This step ensures that each aspect of the assessment appropriately influences the final outcome[20]. Additionally, each criterion is classified into one of two categories: benefit or cost. Benefit criteria are those where a higher value is preferred, such as student attitude, *pesantren* report cards, and madrasah report cards. In contrast, cost criteria are those where a lower value is preferred, such as security violations, absenteeism in *ubudiyah* and *halaqoh*, and language violations [21]. By assigning weights and categorizing the criteria in this manner, the decision-making process becomes more objective and aligned with predefined standards.

3.3. Determine the Value of Students on Each Criterion

The scoring of each student in each criterion is done through systematic mathematical calculations to ensure objectivity and accuracy in evaluation. Numerical analysis-based approaches in multi-criteria decision-making enable more accurate rankings by considering weights as well as comparisons between relevant factors.[22]. In this study, out of 21 alternatives analyzed in various classes, the system automatically selected the best 7 alternatives based on the final calculation results, ensuring that the best performing students could be identified appropriately[23]. Data-driven ranking systems are essential in educational settings, as they enable fairer and more transparent evaluation of student performance[24]. As such, this approach not only improves the accuracy of selection, but also provides a more comprehensive insight into the academic and non-academic qualities of the students being assessed.

3.4. Calculate the Normalization Value

The normalization stage plays a vital role in the SAW decision-making process, as it transforms diverse criterion values into a common scale, allowing for fair and consistent comparisons[25]. This process adjusts the different criterion values to ensure they are comparable in the calculation process. In the SAW method, two normalization approaches are applied: one for benefit criteria and one for cost criteria. For benefit criteria (where higher values are better), normalization is performed by dividing the value of an alternative by the maximum value of the criterion. Conversely, for cost criteria (where lower values are better), normalization is done by dividing the minimum value by the value of the alternative. The normalization formula used is as follows:

$$r_{ij} = \begin{cases} \dfrac{X_{ij}}{\underset{i}{Max_{ij}}} & \text{If j is a benefit attribute (benefit)} \\ \\ \dfrac{X_{ij}}{\underset{i}{Min_{ij}}} & \text{If j is a cost attribute (cost)} \end{cases} \tag{1}$$

Where:

rij = normalized performance rating
xij = the value of the attributes of each criterion
Max Xij = the largest value of each criterion
Min Xij = the smallest value of each criterion

3.5. Determining the Final Grade

Determining the preference values is a key step in the Simple Additive Weighting (SAW) method, aimed at calculating the final score of each alternative based on normalized criteria and assigned weights. This process enables direct comparison of the alternatives by considering the relative importance of each criterion [26]. At this stage, the preference value for each alternative is calculated by summing the products of the normalized value and the weight of each criterion. A higher preference value indicates that the alternative better meets the predetermined criteria. The formula used to calculate the preference value is as follows:

$$Vi = \sum_{j=1}^{n} W_j \, r_{ij} \tag{2}$$

Where :

Vi = preference weight value (final value) of each alternative
Wi = predetermined weight value
rij = Rating value (matrix normalization)

3.6. Determining the Ranking of Santri

Determining the ranking of students is the final stage in the Simple Additive Weighting (SAW) method, where the calculated preference values are used to rank students based on their performance in meeting the predetermined criteria. The higher the preference value obtained by a student, the better his position in the final ranking. This process aims to provide an objective and transparent decision in selecting the best *santri* based on a thorough evaluation of all criteria. By determining the ranking, the boarding school can easily identify the best-performing *santri* and provide appropriate rewards or follow-up based on the calculation results.

4. RESULTS AND DISCUSSION

The calculation process for determining the best *santri* at PPTQ Al Kaukab is carried out using the Simple Additive Weighting (SAW) method as a Decision Support System to ensure a structured and objective evaluation. This process begins with conducting observations and interviews to gather relevant data, after which researchers identify seven *santri* who meet the established best criteria. These seven students were selected based on expert recommendations from teachers and administrators who are directly involved in the academic and behavioral monitoring of the *santri*. This purposive sampling method ensures that only students who are considered outstanding by experienced educators are included in the evaluation process.

The SAW method is then applied to calculate the preference value of each *santri*, which reflects their ranking based on predetermined and normalized criteria. The preference value is obtained by summing the products of the normalized values and the assigned weights of each criterion. This step ensures that each criterion contributes proportionally to the final score, allowing for a fair and data-driven selection process. By implementing this method, the system provides an objective final ranking, making it easier for decision-makers to determine the best *santri* in a transparent and systematic manner.

4.1. Santri data collection

In this study, the Simple Additive Weighting (SAW) method was applied to determine the best santri based on several predefined criteria. The process began with *Santri* Data Collection, where relevant data such as attitudes, disciplinary records, attendance in religious activities, academic performance, and other key aspects were gathered. After collecting and structuring the data, each *Santri* was evaluated using the normalization process to standardize different criteria values. Then, the preference values were calculated by multiplying the normalized values with their respective weights.

Table 2. List of students or alternatives

No	Name	Symbol
1	Unifah	A1
2	Aidah Aryani	A2
3	Muhda Lutfa Azizah	A3
4	Syeima	A4
5	Tasa	A5
6	Nafisa	A6
7	Elza	A7

The table above displays a list of names of students who are alternatives in the evaluation process along with unique symbols used to represent each individual. Each student is given a code A1 to A7, which aims to facilitate identification and data processing in the calculation system without having to always use the full name. This symbol is also used in the calculation of the Simple Additive Weighting (SAW) method to determine the final ranking based on predetermined criteria.

4.2. Determination of weight criteria and type

Determine the criteria used in the assessment of students. The determination of these criteria is done through observations and interviews to ensure that each aspect assessed is relevant and has an important role in the evaluation process. In this study, seven main criteria have been determined as the basis for assessing students at PPTQ Al Kaukab, which are presented in a table along with symbols and types of assessment. Once the criteria are determined, the next step is to assign a weight to each criterion to reflect its level of importance in the evaluation process. This weight is determined through in-depth analysis by considering various factors that affect the quality of students. The following table shows the criteria and the weights that have been determined for the assessment process.

Table 3. Weight value on each criterion

No	Criteria	Code	weight	Type
1	Attitude	C1	0.2	Benefit
2	Security Violation Points	C2	0.19	Cost
3	Ubudiyah Absence	C3	0.18	Cost
4	Halaqoh Absence	C4	0.13	Cost
5	Pesantren Report Card	C5	0.1	Benefit
6	Madrasah Report Card	C6	0.1	Benefit
7	Language Violation Points	C7	0.1	Cost

The table above shows the list of criteria used in the *santri* evaluation system along with their codes, weights, and criteria types. Attitude (C1) has the highest weight (0.2) and is beneficial, which means that the higher the value, the better for the *santri*. Conversely, Security Violation Points (C2), Ubudiyah Absence (C3), Halaqoh Absence (C4), and Language Violation Points (C7) are cost, which means that the higher the value, the more detrimental it is to the *santri* in the assessment. Meanwhile, the Pesantren Report Card (C5) and Madrasah Report Card (C6) have a weight of 0.1 each and are considered benefits, indicating that higher values benefit students. The weights given reflect the level of importance of each criterion in determining the final ranking of students in the evaluation system.

4.3. Determine the value of students on each criterion

At this stage, each alternative (*santri*) is evaluated based on the predetermined criteria. The assigned values represent the raw data, which form the basis for calculations using the Simple Additive Weighting (SAW) method. This process is designed to objectively measure each student's performance according to the established assessment criteria. The following table presents the values assigned to each alternative for every criterion, serving as the initial step in the overall evaluation process.

Table 4. Alternatives and criteria values

Alternative	Criteria						
	C1	C2	C3	C4	C5	C6	C7
A1	95	2	10	1	86	98	9
A2	97	5	11	2	88	95	10
A3	96	1	10	4	85	92	7
A4	96	6	7	5	84	96	12
A5	95	6	6	7	80	94	8
A6	98	8	9	5	82	96	6
A7	95	7	8	4	84	95	9
Max/Min	98	1	6	1	88	98	6

The table above presents data on *santri* alternative scores (A1 to A7) based on seven predetermined criteria (C1 to C7). These values reflect each *santri's* performance in the aspects of attitude (C1), security violation points (C2), absence in *ubudiyah* (C3) and *halaqoh* (C4), as well as *pesantren* (C5) and madrasah (C6) report cards, and language violation points (C7). Each criterion has a maximum and minimum value displayed on the last row, which serves as a reference in the data normalization process using the Simple Additive Weighting (SAW) method. The maximum value is used for benefit criteria, while the minimum value is used for cost criteria, to ensure that the final score calculation is done objectively and accurately.

4.4. Calculate the normalization value

Before further calculations are made, the values of each criterion for each alternative need to be normalized in order to be compared more accurately. This normalization process converts the initial value into a uniform scale between 0 to 1, allowing all alternatives to have the same standard of assessment. Normalization is very important because the data on each criterion often has a different range of values, so without this process, direct comparisons would be difficult. With normalization, the difference in scale is overcome, and the final result can be used in the next stage, which is the combination of values with predetermined criteria weights. These weights represent the significance of each criterion in the decision-making process. The table below displays the normalized values for each criterion across all alternatives.

Table 5. Normalized value

Alternative	Criteria						
	C1	C2	C3	C4	C5	C6	C7
A1	0,97	0,50	0,60	1	0,98	1	0,67
A2	0,99	0,20	0,55	0,50	1	0,97	0,60
A3	0,98	1	0,60	0,25	0,97	0,94	0,86
A4	0,98	0,17	0,86	0,20	0,95	0,98	0,50
A5	0,97	0,17	1	0,14	0,91	0,96	0,75
A6	1	0,13	0,67	0,20	0,93	0,98	1
A7	0,97	0,14	0,75	0,25	0,95	0,97	0,67

The table above shows the normalized values for each alternative student (A1 to A7) based on the predetermined criteria (C1 to C7). Normalization is done to adjust the original values into the range of 0 to 1, thus allowing a fairer comparison between criteria with different scales. For benefit criteria (C1, C5, and C6), values are normalized by dividing each value by the maximum value in that column, while for cost criteria (C2, C3, C4, and C7), normalization is done by dividing the minimum value by the value of each student. The outcomes of this process are utilized in the subsequent step to calculate the final scores using the Simple Additive Weighting (SAW) method, ensuring an objective ranking of the students.

4.5. Determining the final grade

At this stage, the calculation of the final score is done by combining the normalized value that has been obtained with the weight of each criterion. This process involves multiplying the normalized value of each criterion by the predetermined weight, then summing to get the final score of each alternative. This final score reflects the level of preference of each alternative comprehensively, This allows for the identification of the top-ranking individual. The table below shows the final score results for each alternative.

Table 6. Final value

No	Alternative	Final Grade
1	A1	0,791
2	A2	0,656
3	A3	0,803
4	A4	0,651
5	A5	0,686
6	A6	0,661
7	A7	0,648

The table above displays the final grade obtained by each alternative student (A1 to A7) after going through the calculation process using the Simple Additive Weighting (SAW) method. Final Grade is obtained by summing up the results of multiplying the normalized value of each criterion with the weight of the criteria concerned. The higher the final grade, the better the *santri* rank in the evaluation system. From the calculation results, A3 has the highest score (0.803), which indicates that the student has the best performance based on predetermined criteria, followed by A1 (0.791) and A5 (0.686). Meanwhile, A7 has the lowest score (0.648), indicating that the student has the lowest overall score in this evaluation. This final score becomes the basis in the decision-making process to determine the best *santri*.

4.6. Determining the ranking of santri

After the final score of each alternative is calculated, the next step is to rank the students based on the score obtained. The higher the final score, the higher the *santri* rank in this evaluation system. This ranking helps in making decisions to choose the best students according to predetermined criteria. The table below displays the ranking of *santri* based on the final scores calculated using the Simple Additive Weighting (SAW) method.

Table 7. Student ranking score

No	Alternative	Final Grade	Ranking
1	A3	0,803	1
2	A1	0,791	2
3	A5	0,686	3
4	A6	0,661	4
5	A2	0,656	5
6	A4	0,651	6
7	A7	0,648	7

The results of the calculation using the SAW method showed that student A3 achieved the highest final score (0.803), followed by A1 (0.791) and A5 (0.686). These rankings are consistent with recommendations from teachers and administrators, indicating that the method produced accurate results aligned with expert evaluations. To validate the accuracy of the system, initial calculations were cross-checked using Microsoft Excel, confirming that the automated results matched manual computations. This demonstrates that the SAW method can reliably process multi-criteria data with minimal error.

In addition to accuracy, the implementation of the SAW-based decision support system also improved the effectiveness of the student evaluation process. By using predefined criteria and weightings, the system minimized subjectivity and ensured that all assessment aspects both academic and non-academic—were considered transparently. Stakeholders could easily review the ranking outcomes and understand how each criterion contributed to the final decision, thereby enhancing trust in the selection process.

Furthermore, the system significantly increased efficiency compared to previous manual methods. Tasks such as data normalization, weighting, and ranking, which previously required considerable time and effort, were completed more quickly through automated processing. This allowed decision-makers to focus on evaluating results rather than managing complex calculations. Overall, the SAW method proved to be an effective and efficient solution for identifying top-performing students while maintaining fairness and accountability.

5. CONCLUSION

This study presents a Decision Support System utilizing the Simple Additive Weighting (SAW) method, which significantly improves the accuracy, effectiveness, and efficiency of selecting outstanding *santri* within *pesantren* institutions. The system enables more accurate results, as it produces rankings aligned with expert evaluations through a structured, weighted assessment model. The effectiveness of the system is demonstrated by its ability to streamline the decision-making process, minimizing subjectivity and enabling fair, transparent selection. Moreover, the use of a web-based interface contributes to greater efficiency, reducing the time and effort required compared to traditional manual evaluation methods. Through predefined criteria and normalized calculations, the SAW method allows for focused, data-driven assessments that reflect the real academic and character strengths of each *santri*. The system not only supports educational quality improvement efforts but also aligns with the *pesantren's* mission to reward student excellence as a measurable achievement. Nonetheless, this study has its limitations. It was tested on a relatively small number of students from a single *pesantren*, and the evaluation criteria used may not cover the full spectrum of *santri* excellence. Additionally, the reliance on Excel and a basic web application may hinder scalability for larger institutions. Future research should aim to expand the evaluation scope, integrate more advanced technologies, and test the system across diverse educational environments to enhance its reliability and applicability.

ACKNOWLEDGEMENTS

The author extends heartfelt appreciation to everyone who played a role in the successful completion of this research. This work would not have been possible without the support, assistance, and guidance from numerous individuals who generously shared their time, effort, and insights. Special thanks are directed to Pondok Pesantren Tahfidzul Qur'an (PPTQ) Al Kaukab for granting access to essential data and information that significantly contributed to this study. The author is sincerely grateful for the permission and collaboration provided by the institution, which greatly facilitated the smooth progress of this research. May all the kindness and support received be returned with abundant blessings.

REFERENCES

[1] A. Ahmad and Y. I. Kurniawan, “Sistem Pendukung Keputusan Pemilihan Pegawai Terbaik Menggunakan Simple Additive Weighting,” *J. Tek. Inform.*, vol. 1, no. 2, pp. 101–108, 2020, doi: 10.20884/1.jutif.2020.1.2.14.

[2] J. H. Y. S. Wan Mariatul Kifti, “Analisis Sistem Pendukung Keputusan Menentukan Produk Terlaris dengan Metode Simple Additive Weighting,” *Swabumi*, vol. 10, no. 1, pp. 77–87, 2022, doi: 10.31294/swabumi.v10i1.12226.

[3] G. Lestari and A. Savitri Puspaningrum, “Sistem Pendukung Keputusan Pemberian Tunjangan Karyawan

Menggunakan Metode Analytical Hierarchy Process (Ahp) Studi Kasus: Pt Mutiara Ferindo Internusa," *J. Teknol. dan Sist. Inf.*, vol. 2, no. 3, pp. 38–48, 2021.

[4] N. Tri Romadhona *et al.*, "Peningkatan Kualitas Pendidikan Melalui Bimbingan Belajar," *J. Community Serv. Engagem.*, vol. 2, no. 6, pp. 18–23, 2022.

[5] R. Taufiq, *Sistem Pendukung Keputusan*, Edisi Pert. Jakarta: Penerbit Mitra Wacana Media, 2020.

[6] T. H. Salsabila, T. M. Indrawati, and R. A. Fitrie, "Meningkatkan Efisiensi Pengambilan Keputusan Publik melalui Kecerdasan Buatan," *J. Internet Softw. Eng.*, vol. 1, no. 2, p. 21, 2024, doi: 10.47134/pjise.v1i2.2401.

[7] B. Hendrik, T. Informatika, U. Putra, I. Upi, and Y. Padang, "Review Metode Sistem Pendukung Keputusan (SPK) Terbaik untuk Seleksi Proposal Penelitian : Evaluasi Berdasarkan Kriteria Efektivitas dan Akurasi," *J. Educ. Res.*, vol. 0738, no. 4, pp. 6456–6462, 2024.

[8] D. Pasha, "Sistem Pendukung Keputusan Pemilihan Jasa Travel Menggunakan Metode Multi Attribute Utility Theory," *J. Ilm. Comput. Sci.*, vol. 2, no. 2, pp. 70–77, 2024, doi: 10.58602/jics.v2i2.23.

[9] M. A. Al-Marom and S. Wibisono, "Sistem Penunjang Keputusan Rekomendasi Kelulusan dan Pemeringkatan Santri Menggunakan Metode AHP-TOPSIS," *J. Ilm. Media Sisfo*, vol. 15, no. 1, pp. 49–59, 2021, doi: 10.33998/mediasisfo.2021.15.1.998.

[10] A. Zumarniansyah, R. Ardianto, Y. Alkhalifi, and Q. Nur Azizah, "Penerapan Sistem Pendukung Keputusan Penilaian Karyawan Terbaik Dengan Metode Simple Additive Weighting," *J. Sist. Inf.*, vol. 10, no. 2, pp. 75–81, 2021, doi: 10.51998/jsi.v10i2.419.

[11] I. Ali, V. Gunawan, and K. Adi, "Land-use suitability evaluation for organic rice cultivation using fuzzy-AHP ELECTRE method," *Regist. J. Ilm. Teknol. Sist. Inf.*, vol. 7, no. 1, pp. 1–15, 2021, doi: 10.26594/register.v7i1.2080.

[12] I. Kurnia, "Sistem Pendukung Keputusan Untuk Menentukan Siswa Terbaik Menggunakan Kombinasi Metode Ahp Dan Saw," *JIKO (Jurnal Inform. dan Komputer)*, vol. 4, no. 3, pp. 164–172, 2021, doi: 10.33387/jiko.v4i3.3339.

[13] J. Prasetiana, Ravie K. Laday, and Satria, "Sistem Pendukung Keputusan Pemilihan Santri Terbaik Dengan Menggunakan Metode Simple Additive Weigthing (Saw) Pondok Pesantren Al - Washilah," *ISTA Online Technol. J.*, vol. 5, no. 1, pp. 46–55, 2024, doi: 10.62702/ion.v5i1.106.

[14] D. M. El Faritsi, D. Saripurna, and I. Mariami, "Sistem Pendukung Keputusan Untuk Menentukan Tenaga Pengajar Menggunakan Metode MOORA," *J. Sist. Inf. Triguna Dharma (JURSI TGD)*, vol. 1, no. 4, p. 239, 2022, doi: 10.53513/jursi.v1i4.4948.

[15] C. T. Surya Wigatil, S. Ipnuwati, and K. Zuhri, "Sistem Penunjang Keputusan Untuk Menentukan Santri Berprestasi Menggunakan Metode SAW (Studi Kasus : Pondok Pesantren Al-Ma'ruf Lampung)," *J. Teknol. dan Inform.*, vol. 3, no. 1, pp. 1–11, 2022, doi: 10.57084/jeda.v3i1.992.

[16] I. Ismayadi, A. A. Samudra, and S. Junaidi, "Sistem Pendukung Keputusan Pemilihan Siswa Berprestasi Menggunakan Metode Simple Additive Weighting (SAW) Di SMA Negeri 1 Siberut Selatan," *J. Inform. Kaputama*, vol. 6, no. 2, pp. 137–149, 2022, doi: 10.59697/jik.v6i2.112.

[17] A. A. Hulu, M. Mesran, and J. H. Lubis, "Penerapan Metode SAW (Simple Additive Weighting) Dalam Menentukan Juara Perlombaan Vocal Group," *TIN Terap. Inform. Nusant.*, vol. 2, no. 11, pp. 657–662, 2022, doi: 10.47065/tin.v2i11.1501.

[18] D. A. Fernando, Hartatiana, and F. Ismail, "Pentingnya Validitas Dan Reliabilitas Instrument Evaluasi Pada Pembelajaran Pendidikan Agama Islam," *J. Tarb. Islam.*, vol. 8, no. 3, pp. 64–73, 2023.

[19] Y. Rahayaan and A. S. Purnomo, "Analisis Penentuan Kualitas Pengajaran Guru Dengan Pendekatan Metode Simple Additive Weighting," vol. 6, no. 2, pp. 203–210, 2024.

[20] V. M. Wulandari, N. Latifah, and S. Muzid, "Metode Penerapan Simple Additive Weighting (SAW) Pada Aplikasi Seleksi Peserta Program Kecakapan Wirausaha (PKW) Pada Lembaga Kursus dan Pelatihan (LKP) Harmoni," *J. Softw. Eng. Ampera*, vol. 4, no. 1, pp. 35–44, 2023, doi: 10.51519/journalsea.v4i1.376.

[21] B. Haqi and J. Sinaga, "Pemilihan Pegawai Terbaik Dengan Metode Simple Additive Weighting (Saw) Menggunakan Framework Bootstrap (Studi Kasus : Pt Bas)," *J. Math. Technol.*, vol. 2, no. 2, pp. 241–248, 2023.

[22] M. N. Sutoyo, "Sistem Pendukung Keputusan untuk Seleksi Produk Unggulan UMKM dengan Metode MADM Model Yager," vol. 4, no. 1, pp. 1–12, 2025, doi: 10.31284/p.semtik.2025-1.7144.

[23] Darsin and D. Triyana, "Sistem Penilaian Kinerja Karyawan Dengan Menggunakan Metode Simple Additive Weighting (SAW)," vol. 9, pp. 79–87, 2021.

[24] A. Sulistiyawati, "Penerapan Metode MOORA dan LOPCOW Dalam Seleksi Penerimaan Guru Bimbel," vol. 2, no. 2, pp. 197–208, 2024.

[25] H. Saragih and A. M. Harahap, "Sistem Informasi Pengelolaan Donasi Sembako Panti Asuhan Menggunakan Metode Simple Additive Weighting," vol. 5, no. 1, 2024, doi: 10.30865/klik.v5i1.2087.

[26] R. H. M. Napitupulu, C. Handayani, and H. Haryati, "Metode Simple Additive Weighting (SAW) Untuk Menentukan Karyawan Outsourching Terbaik Di PT Bank BNI Cabang Cirebon," *Bina Insa. Ict J.*, vol. 8, no. 2, p. 166, 2021, doi: 10.51211/biict.v8i2.1584.

BIOGRAPHIES OF AUTHORS

I Putu Deny Arthawan Sugih Prabowo is a dedicated Lecturer in Information Systems at the Kalimantan Institute of Technology (ITK), specializing in IT Service Management, Project Management, and Digital Security. He holds a master's degree in engineering (M.Eng.) and possesses various professional certifications, including ITIL Foundation and IT Project Supervisor. In addition to teaching, he serves as a competency assessor and actively contributes to research in IT service management and project management. He can be contacted at email: putudeny.asp@lecturer.itk.ac.id.

Hana Mufidianingsih is an Information Systems student with a strong interest in technology and data analysis. She is actively involved in research on decision support systems and computational methods. With skills in programming and system modeling, she aims to contribute to technological advancements through research and practical applications. She can be contacted at email: hannamufidia79@gmail.com.

Mohammad Reza Fahlevi is a dedicated and results-oriented Lecturer in Informatics Engineering at the Nahdlatul Ulama University of Indonesia, with extensive experience in IT and Risk Management. Reza has worked as an IT Systems Analyst and IT Consultant, as well as serving in Risk Management as a leading startup. In this role, Reza utilizes expertise in IT to identify, evaluate, and manage risks related to technology and business operations in a dynamic business environment. He can be contacted at email: rezafah@unusia.ac.id.