Web-Based Decision Support System for Paskibra Member Selection Using the Fuzzy Sugeno Method

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Article Info:	**ABSTRACT**
Article History: Received: 07-08-2026 Revised: 23-08-2026 Accepted: 27-08-2026 Available Online: 31-08-2026 **Keyword:** *Decision Support System,* *Fuzzy Sugeno,* *Paskibra Member Selection,* *Black Box Testing,* *White Box Testing*	*This study designed and built a web-based Decision Support System (DSS) that applied the Fuzzy Sugeno method to support Paskibra member selection at the district level, where manual scoring had left qualitative criteria such as the interview without a firm boundary between eligibility categories. Three criteria were used: Height, Knowledge Test Score, and Interview Score. Sugeno was selected because its rule consequents were crisp values, which allowed a lightweight weighted-average defuzzification instead of the heavier defuzzification required by Mamdani. The system was built with PHP, MySQL, and Bootstrap, converting each criterion into fuzzy membership degrees and evaluating a configurable IF-THEN rule base to produce a final score. Testing combined Black Box Testing across ten functional modules and White Box Testing with cyclomatic complexity analysis on the core calculation module. The Black Box results showed all modules functioned as intended, while the White Box analysis yielded a cyclomatic complexity of V(G) = 3, with all three independent paths executing without logical error. The resulting system offered selection committees a traceable, rule-based alternative to manual scoring, in which criteria weighting could be adjusted through the rule base rather than through code changes.*

1. INTRODUCTION

Selection of prospective Paskibra members at the school and district level considers several aspects at once, namely physical condition, knowledge, and interview performance. In manual selection, qualitative criteria such as the interview do not have a sharp boundary between categories such as "sufficient" and "good", so two evaluators can reach different decisions on identical candidate data. The root of the problem lies in the vagueness of the boundary between assessment categories itself, which calls for an approach capable of measuring the degree of fit in a graded manner rather than a binary one.

Fuzzy logic addresses this vagueness by mapping numerical values to graded membership degrees instead of binary categories. One of its variants, Fuzzy Sugeno, introduced by Michio Sugeno in 1985, produces rule outputs in the form of constants or linear equations, unlike Mamdani, whose outputs are fuzzy sets. This difference allows the Sugeno defuzzification stage to be carried out simply through a weighted average to obtain a crisp value directly (Sihombing, 2024). This characteristic makes Fuzzy Sugeno lighter to implement in web systems compared to Mamdani, and it has been applied across various DSS domains such as used-goods pricing (Letsoin & Purnomo, 2024), early detection of stunting in toddlers (Sutisna & Adiwisastra, 2024), and location selection based on user preference (Santriaji et al., 2025).

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Several prior studies inform the gap this research addresses. Letsoin and Purnomo (2024) applied Fuzzy Tsukamoto to price used motorcycles and measured accuracy through MAPE against 20 test data points, obtaining a success rate of 53.39%, indicating that a complete fuzzy rule base alone does not guarantee high accuracy. Sutisna and Adiwisastra (2024) applied Fuzzy Sugeno to classify stunting levels in 69 toddlers based on height, demonstrating the method's ability to classify physical condition into several eligibility levels consistently. Santriaji et al. (2025) built a DSS for selecting the best café and concluded that Fuzzy Sugeno was superior in handling subjective data, but without structural testing of the implementation. As a comparison from the non-fuzzy group, Nalatissifa and Ramdhani (2020) applied TOPSIS to determine eligibility for uninhabitable-house assistance, and Natanael and Kusumaningsih (2021) applied Weighted Product to select the best youth organisation member, both of which performed well when criteria were directly measurable without category ambiguity. Sihombing (2024) confirmed that the difference between Mamdani and Sugeno lies in the form of the rule consequent, supporting the choice of Sugeno in this study since a crisp consequent allows for simpler defuzzification. The pattern across these studies is consistent: Fuzzy Sugeno performs well when criteria mix measurable and nuanced aspects, but none of them included structural testing based on cyclomatic complexity to verify the correctness of the calculation logic, a gap this study addresses.

This study designed and built a web-based DSS for Paskibra member selection at the Tangerang Regency level using Fuzzy Sugeno across three criteria: Height, Knowledge Test Score, and Interview Score. Its main contribution lay in managing the criteria, fuzzy sets, and IF-THEN rule base as modules that an administrator could change through the interface, rather than hard-coding them as in most fuzzy-based DSS implementations. This allowed the selection committee to adjust assessment weighting between periods without developer involvement. System feasibility was verified through Black Box Testing for functional correctness and White Box Testing with cyclomatic complexity calculation for the structural correctness of the calculation module.

2. METHOD

Research Stages

The research was carried out in six stages. The first stage was a literature review of DSS and Fuzzy Sugeno, followed by a needs analysis through a study of the running Paskibra selection process, including the criteria and weighting used by the committee. The third and fourth stages were the design of the database and the Fuzzy Sugeno implementation flow, followed by system implementation using PHP and MySQL. The fifth stage was testing, covering data simulation, Black Box Testing, White Box Testing, and committee feedback. The final stage was analysing the results to assess the improvement in objectivity and efficiency compared with the manual process.

System Architecture

The system followed a three-layer architecture. The presentation layer consisted of a Bootstrap-based web interface accessed by two user roles, administrator and student, through an ordinary browser. The application layer, built in PHP, was organised into modules for authentication and user management, student data management, criteria management, fuzzy set management, fuzzy rule management, the scoring and calculation engine that carried out fuzzification, rule evaluation, and defuzzification, and selection-result announcement. The data layer used a MySQL database whose tables mirrored the application modules (students, criteria, fuzzy sets, fuzzy rules, scores, and results), structured according to the ERD-based schema described below so that the criteria, fuzzy set, and fuzzy rule tables stayed consistent and free of redundancy. Figure 1 summarises how these three layers were connected.

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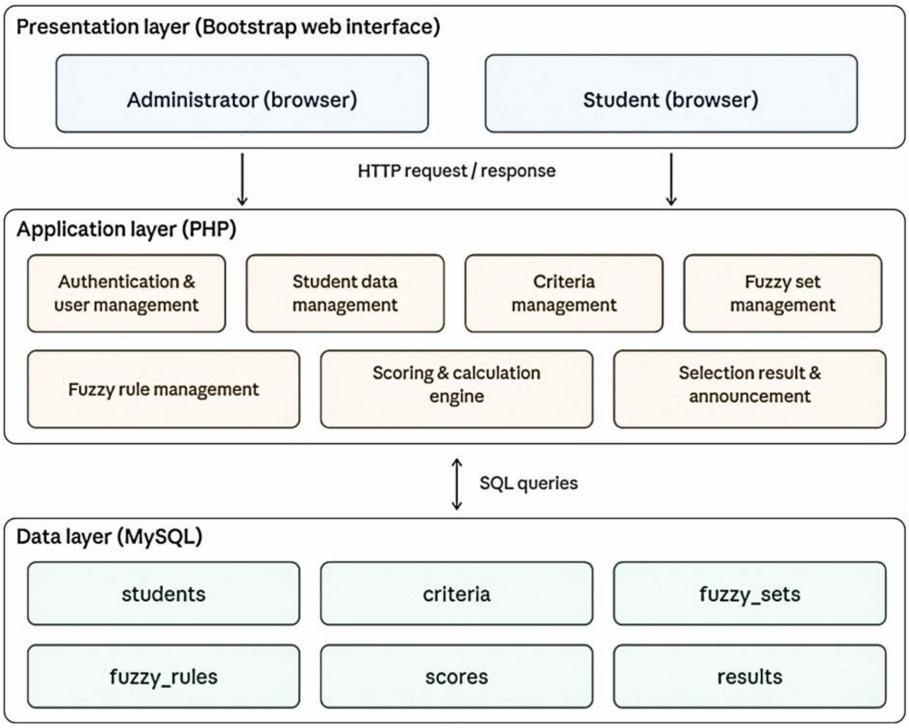

Figure 1. System Architecture

Criteria and Value Ranges

The system used three input variables, namely Height, Knowledge Test Score, and Interview Score, and one output variable, the selection result. The criteria and value ranges for each variable were determined based on direct observation, interviews with the head and supervisor of the school Paskibra unit and the selection committee, and a study of prior selection period documents, as presented in Table 1.

Table 1. Variables and Value Ranges

Variable	Function	Min	Max
Height (cm)	Input	160	185
Knowledge Test Score	Input	70	100
Interview Score	Input	65	100
Selection Result	Output	-	-

The data for the three criteria were stored in a relational database schema designed following Entity Relationship Diagram (ERD) principles, so that the relationships between the criteria, fuzzy set, and fuzzy rule tables remained consistent and free of redundancy, consistent with structured database design practice in other case studies (Mukhlis & Santoso, 2023; Akbar et al., 2025).

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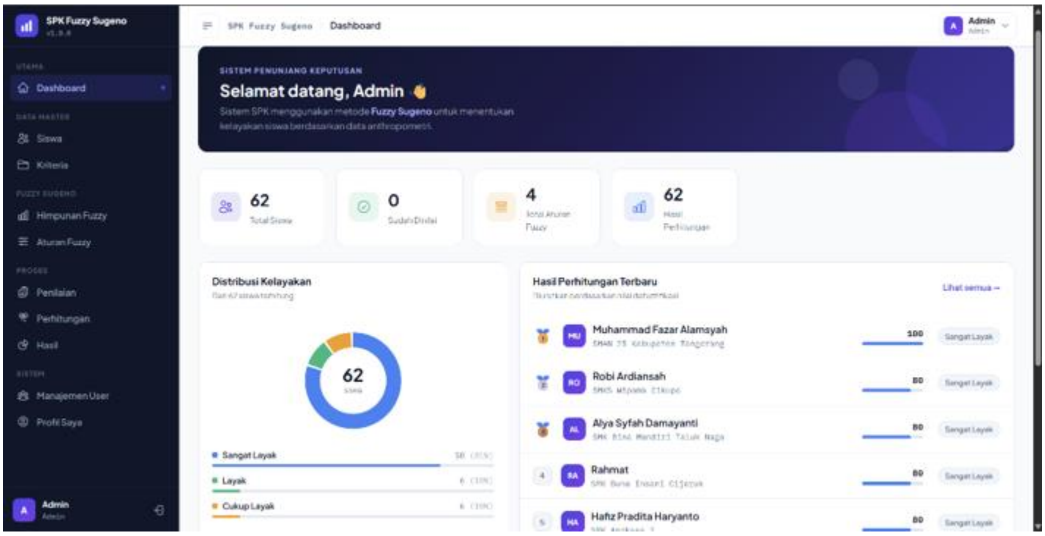

Figure 2. System Dashboard

The dashboard displays a summary of registered students, active criteria, and the latest calculation status, serving as the administrator's entry point to all system modules, including student data, criteria, fuzzy sets, fuzzy rules, scoring, calculation, and selection results.

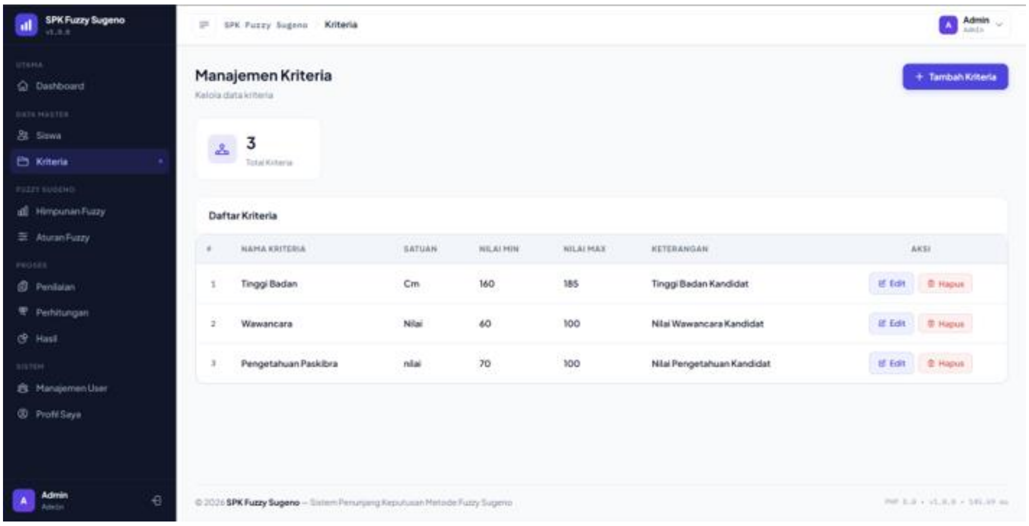

Figure 3. Criteria Management

This page stores the definitions of Height, Knowledge Test Score, and Interview Score together with their minimum-maximum value ranges, as a direct representation of Table 1 within the system.

Fuzzy Set Formation

Each input variable was mapped to three triangular fuzzy sets (Low, Medium, High) with points (a, b, c) as shown in Table 2.

Table 2. Fuzzy Sets per Variable

Variable	Low (a, b, c)	Medium (a, b, c)	High (a, b, c)
Height	160, 165, 170	165, 172.5, 180	175, 180, 185
Knowledge Test Score	70, 75, 80	75, 85, 95	90, 95, 100
Interview Score	60, 70, 80	70, 80, 90	80, 90, 100

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This three-set triangular approach was consistent with other applications of Fuzzy Sugeno that likewise map continuous variables to three eligibility categories, such as an automatic watering and monitoring system for oil-palm seedlings based on soil moisture (Suprasetyo et al., 2023).

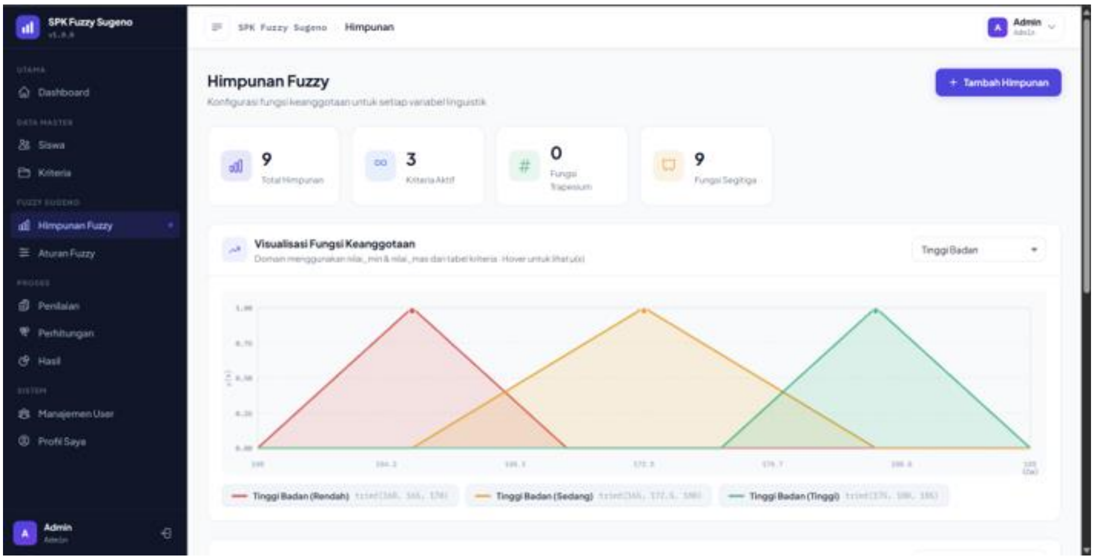

Figure 4. Fuzzy Set Management

The figure above visualises the triangular membership curve for each set while storing the (a, b, c) parameters from Table 2, allowing the administrator to check for overlap between sets directly before they are used in calculation.

Membership Function

The degree of membership μ(x) was calculated using rising and falling linear functions, depending on the position of x relative to the boundaries (a, b, c):

Rising linear:

$$\mu(x) = 0\ for\ x < a;\ \frac{x-a}{b-a}\ for\ a \leq x \leq b; 1\ for\ x > b$$

Falling linear:

$$\mu(x) = 1\ for\ x < a; \frac{b-x}{b-a}\ for\ a \leq x \leq b;\ 0\ for\ x > b$$

Rule Base and Defuzzification

The rule base connected combinations of fuzzy sets across the three criteria to a crisp output value z, in IF-THEN form. For example: IF Height = High AND Knowledge Test Score = Medium AND Interview Score = High THEN z = 90. The rule base was managed by the administrator through the interface rather than hard-coded, so that assessment weighting could be adjusted between selection periods. This zero-order rule structure, with a single crisp-value consequent, was also applied in research on raw material inventory prediction (Warmansyah & Hilpiah, 2019) and production composition determination at a bread factory based on demand data (Rahakbauw, 2015), both of which showed that a rule structure this simple was already adequate for domains with a limited number of criteria combinations.

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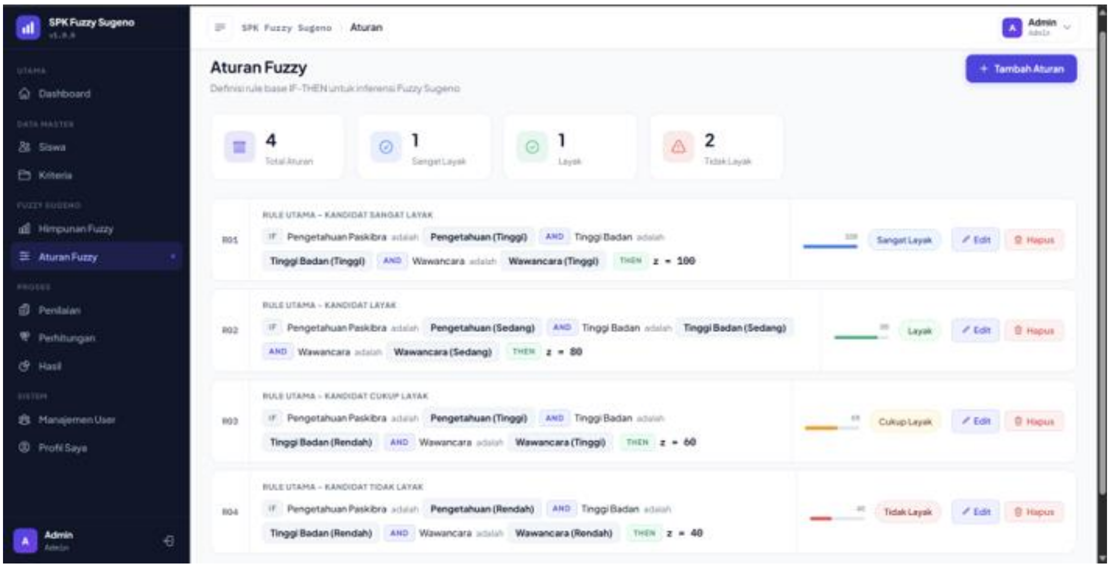

Figure 5. Fuzzy Rule Management

This page can be seen to display the active rule base in IF-THEN format together with each rule's output value (z) and category label (Highly Eligible, Eligible, Fairly Eligible, Not Eligible), which the system refers to directly when running rule evaluation at the calculation stage. The membership value of each rule (α-predicate or fire strength) is calculated using the AND (minimum) operator over the membership degrees of the three criteria. The final value is obtained through weighted-average defuzzification:

$$z = \frac{\Sigma(\alpha_{\mathrm{i}} \cdot z_{\mathrm{i}})}{\Sigma(\alpha_{\mathrm{i}})}$$

where α_i is the fire strength of rule i and z_i is that rule's output value.

System Testing

Black Box Testing verified the correspondence between output and input across ten modules (login, student data, criteria, fuzzy sets, fuzzy rules, scoring, calculation, selection result, user management, user profile) without examining code structure (Kesuma Jaya et al., 2019). White Box Testing traced the code and flowgraph of the calculation module to compute cyclomatic complexity $V(G) = E - N + 2$, where E is the number of edges and N the number of nodes in the flow graph, to determine the minimum number of independent paths that needed to be tested.

3. RESULTS AND ANALYSIS

Calculation Illustration

This section demonstrates the calculation mechanism using the Table 2 parameters, for a candidate with a Height of 178 cm, a Knowledge Test Score of 88, and an Interview Score of 85. The following is an illustration of the calculation in the fuzzification process:

a) Height

$$Medium = \frac{180 - 178}{180 - 172.5} = 0.267$$

b) Knowledge Test Score

$$Medium = \frac{95 - 88}{95 - 85} = 0.700$$

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c) Interview Score

$$Medium = \frac{90-85}{90-80} = 0.500;$$

$$High = \frac{85-80}{90-80} = 0.500.$$

Four rule combinations were active, with α calculated using the minimum operator:

Table 3. Rule Evaluation

Rule	Condition	α	z
R1	Height = Medium, Knowledge =Medium, Interview = Medium	Min (0.267; 0.700; 0.500) = 0.267	70
R2	Height = Medium, Knowledge = Medium, Interview = High	Min (0.267; 0.700; 0.500) = 0.267	80
R3	Height = High, Knowledge = Medium, Interview = Medium	Min (0.600; 0.700; 0.500) = 0.500	80
R4	Height = High, Knowledge = Medium, Interview = High	Min (0.600; 0.700; 0.500) = 0.500	90

Defuzzification:

$$z = \frac{0{,}267 \times 70 + 0{,}267 \times 80 + 0{,}500 \times 80 + 0{,}500 \times 90}{0{,}267 + 0{,}267 + 0{,}500 + 0{,}500} = \frac{125{,}05}{1{,}534} \approx \mathbf{81{,}54}$$

This score of 81.54 on a 0-100 scale became the basis for determining the candidate's eligibility status. The four active rules contributed different weights according to their membership strength, with R3 and R4 contributing the most because the candidate's Height was close to the "High" threshold. This graded contribution would not be captured if the criteria were simply summed or averaged directly without accounting for the membership degree of each category.

System Implementation and Execution

The system ran as a web application built with PHP, MySQL, and Bootstrap, serving two roles: an administrator, who managed student data, criteria, fuzzy sets, fuzzy rules, scoring, and calculation; and students, who entered their own data and viewed the selection result. When the administrator pressed the "Calculate All" button on the calculation page, the system automatically ran fuzzification, rule evaluation, and defuzzification across all scored candidate data.

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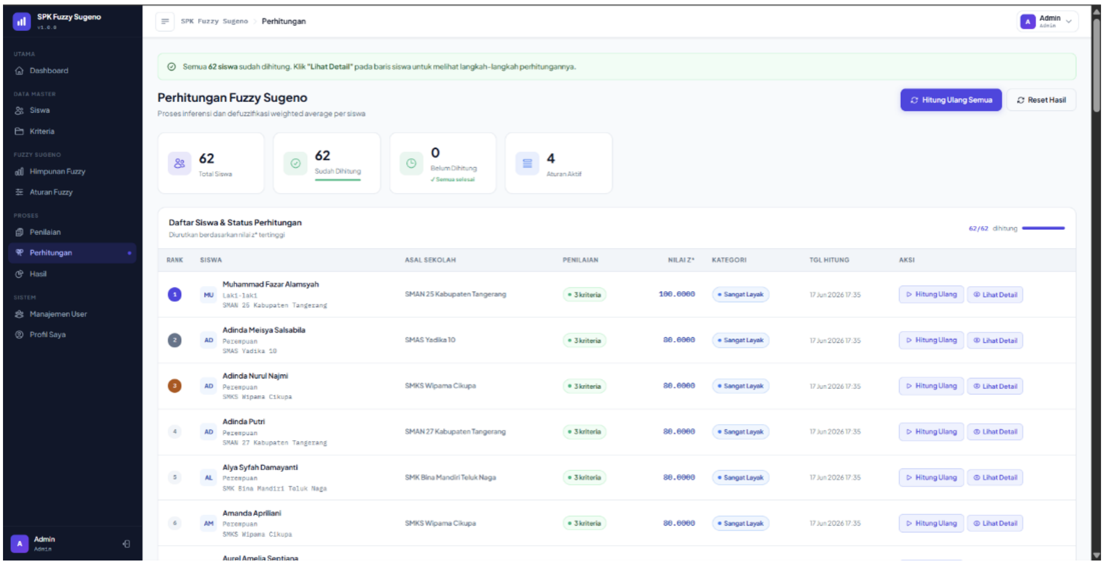

Figure 6. Calculation Page

This page runs the process from fuzzification through defuzzification for all candidate data simultaneously and displays each candidate's calculation status (Not Yet Calculated/Calculated), consistent with the calculation mechanism demonstrated above.

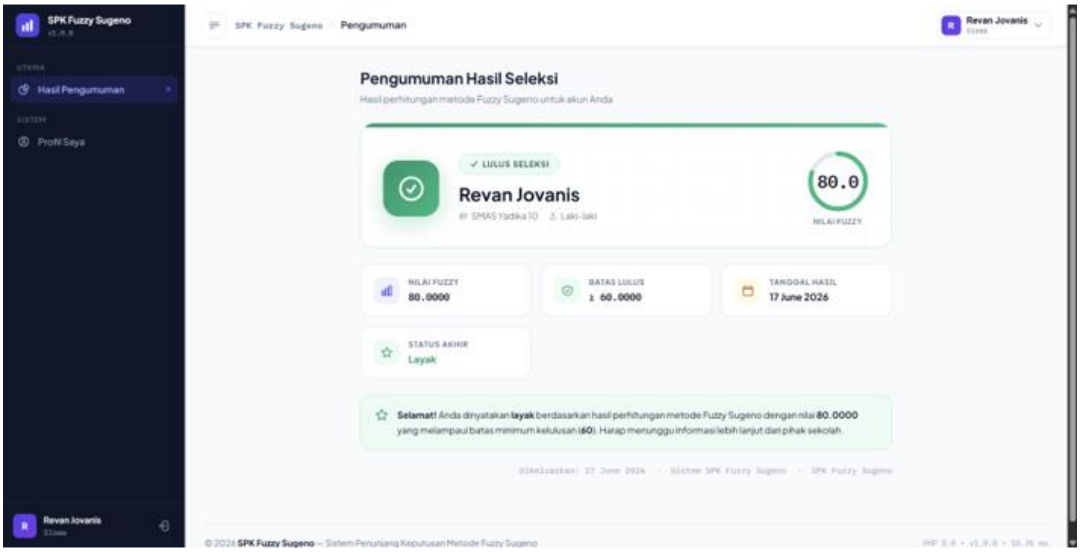

Figure 7. Result Announcement to Students

Once the administrator's calculation is complete, students access their final score, pass/fail status, and the eligibility threshold through this page, showing that the calculation results in Figure 6 are conveyed directly and transparently to prospective members.

Black Box and White Box Testing Results

Black Box Testing covered ten functional modules of the system. All scenarios, from valid input, invalid input, to add/edit/delete data actions, produced the expected output in every module, demonstrating that the system functioned according to its design without failure at the user-interface level. White Box Testing, meanwhile, focused on the final-score calculation module as the core system logic. The module's flowgraph had E = 7 edges and N = 6 nodes, so that:

$$V(G) = E - N + 2 = 7 - 6 + 2 = 3$$

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This value of 3 indicates three independent paths: a linear path with no repetition, a path with one repetition back to the rule-evaluation point, and a path with more than one iteration through the rule-evaluation cycle before reaching the end point. All three paths executed without logical error, demonstrating that the calculation module was free of infinite loops or unreachable code.

Discussion

To illustrate how a rule-base adjustment affects the output score, consider again the candidate profile used in the calculation illustration in Section 3 (Height = 178 cm, Knowledge Test Score = 88, Interview Score = 85; $z \approx 81.54$). If an administrator revised Rule R3 (Height = High, Knowledge = Medium, Interview = Medium) to lower its output value from $z = 80$ to $z = 75$, for example to tighten the standard for candidates who reach a "High" height membership but only a "Medium" interview result, the weighted average for this candidate recalculates to approximately 79.9, a decrease of about 1.6 points. Because the α-weights for this candidate concentrate on Rules R3 and R4 (0.500 each, versus 0.267 for R1 and R2), a change to either rule's output value has a proportionally larger effect on the final score than an equivalent change to R1 or R2. This confirms that the rule base, rather than the source code, is the lever through which the selection committee can tune how strictly the system evaluates borderline candidates between periods.

The rule base was also applied to the actual 2026 Kabupaten Tangerang Paskibra selection. Of 165 candidates who passed administrative verification, 62 attended the two-day selection process on 23–24 May 2026 and were scored using the calculation described above. Fifty of the 62 candidates (80.6%) were subsequently declared eligible (SK No. 042/SK/PASKOKABTANG/V/2026, 30 May 2026); the remaining twelve who completed testing did not meet the eligibility threshold, though their individual scores were not retained in the administrative records reviewed for this study. Among the fifty eligible candidates, the system classified two (4%) as Highly Eligible (scores 78.32–88.07), thirty-six (72%) as Eligible (scores 55.63–74.55), and twelve (24%) as Fairly Eligible (scores 46.00–54.07). Scores across this group ranged from 46.00 to 88.07 ($M = 61.94$, $SD = 8.80$), with half of the fifty eligible candidates (25 of 50) falling within the narrow 60.00–69.99 band just above the passing threshold, indicating that the rule base discriminated most sharply near the Eligible/Fairly Eligible boundary rather than spreading candidates evenly across the scale.

On processing time, the development team estimated that manually recapitulating scores for the 165 registered candidates under the committee's previous paper-based process required approximately eight hours, compared with approximately two hours using the web-based system, an estimated reduction of about six hours, or roughly 75%. This figure reflects the development team's own estimate rather than a formally timed head-to-head trial, since the prior process left no digital records against which to benchmark directly.

Two further comparisons requested during review, validating the system's classifications against an independent expert or committee assessment of the same candidates, and benchmarking Fuzzy Sugeno against alternative methods such as AHP, SAW, or TOPSIS on the same test data, could not be carried out for this deployment. The committee's previous selection process was entirely paper-based and did not retain structured, comparable score records, so no independent dataset exists against which the system's 2026 results could be directly checked; likewise, no parallel computation using an alternative method was performed on the same candidate data. These remain appropriate directions for future validation work, as already noted in the Conclusion.

Black Box Testing demonstrated the correctness of the output from a user's point of view, while White Box Testing demonstrated that this correctness was consistent at the level of program logic. The combination of the two provided a more complete feasibility argument than Letsoin and Purnomo (2024), whose evaluation was limited to numerical accuracy (MAPE) without structural code verification. Compared with non-fuzzy approaches such as TOPSIS (Nalatissifa & Ramdhani, 2020) and Weighted Product (Natanael & Kusumaningsih, 2021), which calculated scores from crisp values without accounting for the degree of vagueness between categories, the Fuzzy Sugeno approach in this system handled boundary conditions, such as the candidate with a height of 178 cm

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falling between the "Medium" and "High" categories in the earlier illustration, through a combination of several weighted rules rather than forcing a single category.

In the domain of individual eligibility assessment, which is closer to the context of this study, Maulana (2024) applied Fuzzy Sugeno to assess bank credit eligibility based on an applicant's financial history, showing that the same weighted-average calculation pattern can be adapted to assess a person's eligibility rather than only the eligibility of an object or a production process. As a further technical development, Wijaya et al. (2022) applied Interval Type-2 Fuzzy Sugeno to water pH control, where membership degrees are represented as intervals rather than single values, to handle more complex uncertainty. That approach is relevant for control systems with rapidly changing sensor data, but it adds computational complexity that was unnecessary for this study, since the three criteria used are discrete and entered manually by the administrator, making a standard zero-order Fuzzy Sugeno sufficient.

4. CONCLUSION

A web-based DSS for the selection of School Paskibra members at the Tangerang Regency level was successfully built by applying Fuzzy Sugeno across three criteria, namely Height, Knowledge Test Score, and Interview Score, from fuzzification through weighted-average defuzzification, on a single PHP and MySQL platform with an administrator-configurable rule base. Black Box Testing across ten modules showed that all functions ran as designed, while White Box Testing on the core calculation module yielded a cyclomatic complexity of V(G) = 3, with all independent paths executing without logical error. These results confirm the correctness of the system's functional behaviour and program logic, but they verify the implementation rather than the selection decisions themselves; establishing that the resulting scores are accurate or objective would require a separate validation, such as comparing the system's output against independent expert or committee judgement on the same candidate data, which fell outside the scope of this study. Further development could therefore add criteria (health screening, discipline, marching drill), validate the system's output against expert or committee judgement to assess the accuracy and objectivity of its decisions, compare Fuzzy Sugeno with AHP, SAW, or TOPSIS on the same test data to measure the relative advantage of each method, provide a responsive version so the selection results can be accessed more widely by candidates and schools, and examine whether the same rule-base pattern could be applied to other candidate-selection domains, such as electing a student organisation chairperson (Thoriq, 2024), to test the portability of the rule base across different selection contexts.

5. ACKNOWLEDGEMENTS

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6. DECLARATION OF CONFLICT OF INTEREST

We declare that we have no conflict of interest.

7. REFERENCES

Akbar, M. R., Zurfadly, A., & Apriani, M. (2025). Perancangan database Elite Hotel Tembilahan menggunakan ERD (Entity Relationship Diagram). *TEKNOFILE: Jurnal Sistem Informasi*, *3*, 105–117. https://jurnal.nawansa.com/index.php/teknofile/article/download/416/264

Kesuma Jaya, M. S. A., Gumilang, P., Andersen, Y. P., & Desyani, T. (2019). Pengujian black box pada aplikasi sistem penunjang keputusan seleksi calon pegawai negeri sipil menggunakan teknik equivalence partitions. *Jurnal Informatika Universitas Pamulang*, *4*(4). https://doi.org/10.32493/informatika.v4i4.3834

Letsoin, A., & Purnomo, A. S. (2024). Pengembangan sistem penunjang keputusan untuk menentukan harga motor bekas menggunakan metode fuzzy Tsukamoto berbasis web. *IJIS*

ISSN Print : 1979-7141
ISSN Online : 2541-1942

- *Indonesian Journal on Information System*, *9*(1), 60–72. https://doi.org/10.36549/ijis.v9i1.311

Maulana, A. (2024). Penerapan logika fuzzy Sugeno untuk keputusan kelayakan kredit bank. *Jurnal Desain dan Analisis Teknologi*, *3*(1), 44–58. https://doi.org/10.58520/jddat.v3i1.45

Mukhlis, I. R., & Santoso, R. (2023). Perancangan basis data perpustakaan universitas menggunakan MySQL dengan physical data model dan entity relationship diagram. *Journal of Technology and Informatics (JoTI)*, *4*(2), 81–87. https://doi.org/10.37802/joti.v4i2.330

Nalatissifa, H., & Ramdhani, Y. (2020). Sistem penunjang keputusan menggunakan metode TOPSIS untuk menentukan kelayakan bantuan rumah tidak layak huni (RTLH) pada Desa Sumbaga. *MATRIK: Jurnal Manajemen, Teknik Informatika dan Rekayasa Komputer*, *19*(2), 246–256. https://doi.org/10.30812/matrik.v19i2.638

Natanael, M. H., & Kusumaningsih, D. (2021). Penerapan metode weighted product pada sistem penunjang keputusan untuk pemilihan anggota terbaik Naposo. *Technologia: Jurnal Ilmiah*, *12*(1). https://ojs.uniska-bjm.ac.id/index.php/JIT/article/view/4181

Rahakbauw, D. L. (2015). Penerapan logika fuzzy metode Sugeno untuk menentukan jumlah produksi roti berdasarkan data persediaan dan jumlah permintaan (Studi kasus: Pabrik Roti Sarinda Ambon). *BAREKENG: Jurnal Ilmu Matematika dan Terapan*, *9*(2), 121–134. https://doi.org/10.30598/barekengvol9iss2pp121-134

Santriaji, A., Ayunda, N., Sinaga, P. A., Damanik, S. R., & Andani, S. R. (2025). Sistem pendukung keputusan pemilihan cafe terbaik bagi kalangan mahasiswa STIKOM Tunas Bangsa Pematangsiantar dengan metode fuzzy Sugeno. *Jurnal Riset Sistem Informasi dan Aplikasi Komputer (JRSIKOM)*, *1*(3), 20–25. https://jrsikom.my.id/index.php/ejournal/article/view/68

Sihombing, F. A. (2024). Kajian fuzzy metode Mamdani dan fuzzy metode Sugeno serta implementasinya. *Innovative: Journal of Social Science Research*, *4*, 4940–4955. http://j-innovative.org/index.php/Innovative/article/view/13108

Suprasetyo, A., Kalifa, A. D., & Diwandari, S. (2023). Penyiraman otomatis dan system monitoring bibit kelapa sawit menggunakan metode fuzzy Sugeno. *Jurnal Ilmu Komputer (JIK)*. https://ejurnal.umri.ac.id/index.php/JIK/article/view/6150

Sutisna, H., & Adiwisastra, M. F. (2024). Aplikasi mobile sistem pendukung keputusan level stunting anak dengan metode fuzzy Sugeno. *Jurnal Komtika (Komputasi dan Informatika)*, *8*(2). https://doi.org/10.31603/komtika.v8i2.12464

Thoriq, M. (2024). Perancangan sistem pendukung keputusan menentukan calon presiden mahasiswa di Universitas Adzkia menggunakan metode fuzzy Sugeno. *Journal-Technology of Computer*, *1*(1), 23–39. https://ojs.adzkia.ac.id/index.php/jtech/article/view/281

Warmansyah, J., & Hilpiah, D. (2019). Penerapan metode fuzzy Sugeno untuk prediksi persediaan bahan baku. *Teknois: Jurnal Ilmiah Teknologi Informasi dan Sains*, *9*(2). https://doi.org/10.36350/jbs.v9i2.58

Wijaya, D. C. M., Rahmat, B., & Puspaningrum, E. Y. (2022). Sistem pendukung keputusan berbasis interval type-2 fuzzy Sugeno pada kendali pH air. *InComTech: Jurnal Telekomunikasi dan Komputer*, *12*(3), 226–239. https://doi.org/10.22441/incomtech.v12i3.15453

ISSN Print : 1979-7141
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