Jurnal Riset Sains dan Teknologi
Volume 9 No. 2 September 2025, 149-163

e-ISSN: 2549-9750
p-ISSN: 2579-9118

Decision Support System for New Employee Recruitment Using Profile Matching and Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE) Method

Sistem Pendukung Keputusan Perekrutan Karyawan Baru Menggunakan Metode Profile Matching dan Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE)

Elsi Titasari Br Bangun[1,2*], Retantyo Wardoyo[2], Yudha Islami Sulistya[3], Bayu Anugerah Putra[4], Fauzan Azim[5]

[1]Department of Information System, Faculty of Computer Science, Universitas Muhammadiyah Riau, Indonesia
[2]Department of Computer Science and Electronics, FMIPA, Universitas Gadjah Mada, Yogyakarta, Indonesia
[3]Software Engineering, Faculty of Informatics, Universitas Telkom Purwokerto, Indonesia
[4,5]Department of Informatics Engineering, Faculty of Computer Science, Universitas Muhammadiyah Riau, Indonesia

*Corresponding author: elsititasari@umri.ac.id

DOI: 10.30595/jrst.v9i2.23640

Histori Artikel:

Diajukan: 16/08/2024

Diterima: 21/08/2025

Diterbitkan: 08/09/2025

ABSTRACT

This research focuses on the challenges of recruiting new employees at Perumdam Tirta Siak Pekanbaru, which often involves time-consuming procedures and is prone to subjective bias. The main objective is to develop a decision support system using the profile matching and Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE) methods to enhance the efficiency and effectiveness of HRD in selecting the best candidates. Profile matching is used to assess applicant competency with company criteria, while PROMETHEE determines the priority order of candidates. The data collected and analyzed includes assessment criteria and user feedback. The conclusion confirms the effectiveness of the system in setting assessment parameters accurately and minimizing subjective bias. The system shows high flexibility in adapting to changing assessment parameters and candidates. Test results show the system is capable of producing consistent and reliable employee ratings, making it a valuable tool in recruitment at Perumdam Tirta Siak. Its implementation is expected to bring the company closer to its long-term strategic goals and strengthen the decision-making process for recruiting new employees.

***Keywords**: Employees; Recruitment; Profile Matching; PROMETHEE*

ABSTRAK

Proses rekrutmen pegawai baru di Perumdam Tirta Siak Pekanbaru kerap menghadapi kendala berupa durasi yang panjang dan potensi ketidakobjektifan dalam penilaian kandidat. Penelitian ini bertujuan merancang sebuah sistem pendukung keputusan yang mampu meningkatkan efisiensi dan akurasi dalam seleksi karyawan. Pendekatan yang digunakan mengombinasikan metode Profile Matching untuk mengevaluasi kesesuaian kompetensi pelamar dengan kebutuhan perusahaan, serta metode Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE) untuk mengurutkan kandidat berdasarkan tingkat prioritas. Data diperoleh dari parameter penilaian dan umpan balik pengguna, yang

kemudian dianalisis untuk membentuk sistem klasifikasi yang lebih objektif. Pengujian sistem menunjukkan bahwa metode ini mampu mengidentifikasi parameter evaluasi secara tepat, bersifat adaptif terhadap perubahan kriteria, serta menghasilkan peringkat kandidat yang stabil dan dapat dipercaya. Secara keseluruhan, sistem ini terbukti efektif dalam mengurangi bias subjektif dan berpotensi menjadi alat bantu yang strategis dalam proses seleksi pegawai di Perumdam Tirta Siak. Penerapannya diharapkan dapat memperkuat proses pengambilan keputusan jangka panjang perusahaan.

Kata Kunci: Karyawan; Rekrutmen; Profile Matching; PROMETHEE

1. INTRODUCTION

Decision support systems are designed to assist management in making decisions in the context of certain situations. Its function is to provide additions to the decision maker's abilities without replacing the evaluation or assessment carried out by the decision maker himself (Turban, Aronson, & Liang, 2007).

According to Kusrini (2007) decision support systems are a subset of computerized information systems, such as knowledge-based systems or knowledge management, that attempt to assist decision-making in organizations or enterprises. This system uses data to produce information that helps in decision-making regarding semi-structured problems.

SPK has been widely developed and used in the education sector. Some examples include, teacher performance assessment (Pramana, Mufizar, Anwar, & Septianingrum, 2022), selection of majors in vocational schools (Atmaja, 2021), division of superior classes for new students (Junaidi, 2021), and determining the best employees (Luthfiah & Muslih, 2022), and recommendations for recruiting lecturers and educational staff (Mahmudi, 2022).

As is well known, rapid technological developments and the use of computers to collect information and solve problems encourage software manufacturers to seek optimal innovations to improve numerical and digital performance. Commercial organizations, private companies, and public organizations are now required to make decisions accurately, quickly, and precisely (Kuswanto, 2020).

Employees play an important role in achieving company goals (Oktawiana, Kosaman, Gunawan, Eko, & Sistem, 2020). Employee quality is an important factor because it can influence the company's overall performance. Because employee quality has great significance in company operations, the selection process for prospective employees is a crucial element in ensuring the availability of a quality and talented workforce for the company (Potale, Lengkong, & Moniharapon, 2016).

Perumdam Tirta Siak Pekanbaru is a local firm that supplies clean water to the neighborhood. As the company grows, routine recruitment is done to fulfill the demands of technicians, administration, customer service, and sales marketing. The need for sales marketing in 2023 creates vacancies practically every day from Monday to Thursday, and interviews are held immediately after reviewing the files.

A fair and effective selection mechanism is required because the number of prospective employees registering has expanded dramatically in recent years relative to the number of employees approved. According to the data obtained, the number of applications can exceed twenty-five in a single recruitment period, with the number of employees accepted ranging from two to five, depending on the demands.

Perumdam Tirta Siak Pekanbaru, in accepting new employees, especially the HRD (Human Resources Department) section, which is directly responsible for managing the process of accepting new employees, must be able to select and provide potential employee selection results to be accepted by the company according to needs.

The primary purpose of the selection procedure is to find the right person for a particular position so that employees can do their job optimally and understand what needs to be done in order to stay with the company for a long period of time. Even though the goal seems very simple, the new employee selection process is quite difficult, time-consuming, and prone to errors in selecting the right people.

This is due to the large number of candidates, sometimes reaching 20 people per recruitment even though 1 or 2 people are

enough. Apart from that, recruitment of new employees at Perumdam Tirta Siak Pekanbaru is still carried out conventionally, namely by announcing in the mass media and sometimes looking for potential employees from colleagues at Perumdam Tirta Siak itself.

The professionalism of employees is questionable because there is a negative impact in the form of nepotism. Not to mention other considerations that are not very influential, such as whether several prospective employees have skills that are not much different or the factors of likes and dislikes. Selection can be made more objective, transparent, and efficient by taking into account competence, experience, technical skills, and Decision Support Systems (DSS).

Although recruitment is not always done, there are a large number of applications, and the selection process is arduous. With DSS, this system can be used whenever the organization needs recruitment. This minimizes selection time, improves accuracy in identifying the top applicants, and lowers the chance of biased evaluation. There are several methods that can be used to build DSS, such as the Profile Matching Method and PROMETHEE.

Profile matching is used to evaluate criteria that approach the decision-maker's ideal value. Meanwhile, the PROMETHEE approach is utilized to establish the order (priority). The PROMETHEE method is known as one of the reasoning methods that is able to solve multi-complex problems that are composed of many alternatives and involve many criteria(Wicaksono & Lucky, 2023).

The PROMETHEE method was chosen because it has several advantages, including having six types of preferences, and all the resulting alternatives or classifications will be sorted partially, completely, stable, clearly, and simply (Pratama, 2019). Preference types are useful for adjusting the needs of decision-makers to each predetermined criterion.

This research not only helps to build DSS-based selection methods, but it also provides practical solutions that businesses may apply in the long run to increase recruitment efficiency.

2. RESEARCH METHODS

This type of research is development research, namely developing a decision support system for recruiting new employees. This study was carried out in Perumdam Tirta Siak Pekanbaru. Data and information are collected to meet the needs of system development. Data and information were gathered using two methods: primary data collection and secondary data collection.

Primary data collection is the acquisition of information directly from the source. The method used in collecting primary data is the interview method. Secondary data collection is the library method. According to Zed (2004), the library method is a method of collecting library data that is processed as research material. The data obtained comes from reports that have received an official copyright or patent from a legitimate body that discusses the topic and title of the research.

Literature data covering the characteristics of recommended employee recruitment comes from Perumdam Siak Pekanbaru. There are two phases used. The first is the intelligence phase, which is the process of identifying existing problems. Data will be obtained and processed into recommendations for the best alternative.

In the second phase, the design phase will analyze existing problems and then take action, then later use a decision-making model to determine the most effective alternate recommendations. Based on the data collected the software design analyzes what is needed and what must be included in the system.

Next, the software design is designed and translated into a program. The decision-making model that is built is described using a flowchart. The flowchart of the decision support system for accepting new employees is seen in **Figure 1**.

2.1 Profile Matching

According to Kusrini (2007), the profile matching approach is a decision-making mechanism that assumes that the object under study must meet an ideal level of predictor variables rather than a minimum level. In general, profile matching is the process of comparing a profile's actual data values to the expected profile values in order to identify discrepancies in competency (also known as gaps). The smaller the gap, the higher the value weight.

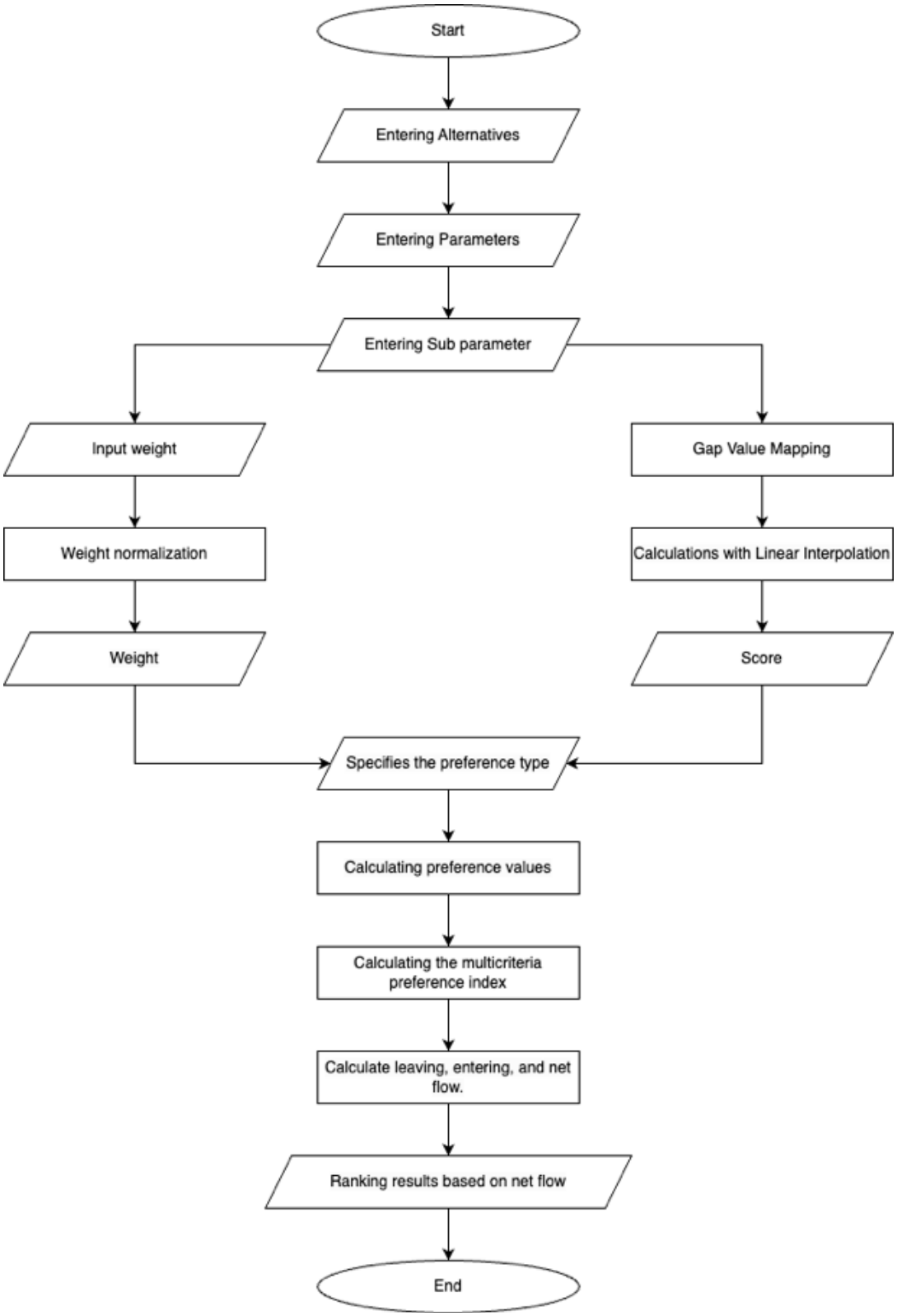


Figure 1. System Flowchart

Table 1. Gap Value Weight

Gap Difference	Value Weight	Information
0	5	Competencies according to requirements
1	4.5	Personal proficiency is an excess of one level.
-1	4	A single level of individual competency is lacking.
2	3.5	Individual competency is two levels higher.
-2	3	Individual competency is two levels short.
3	2.5	Individual competency is three levels higher.
-3	2	Individual competency is three levels short.
4	1.5	Individual competency over 4 levels.
-4	1	There are four levels of individual competency deficiencies.

Phases of Profile Matching

The profile matching method is used in the following steps and calculation formulations:

a) Mapping of Gap Values

The value differential between the goal value and the attribute value is known as the gap. Equation 1 can be used to determine the gap value or difference between the two profiles.

$$\text{Gap} = \text{Attribute Value} - \text{Value Target} \quad (1)$$

b) Weighting

Calculating the competency gap's weight. At this point, **Table 1** will be used to determine the weight of each gap value.

c) Core Factors and Secondary Factors

The characteristics (competencies) that are essential to a position and are anticipated to yield the best results are known as core factors. Items not included in the core factor's characteristics are known as secondary factors.

d) Computing the Total Value

Determine the overall value of all factors by averaging the values of the core and secondary factors that were produced using the proportion of each input factor, that is, 60% for the core factor and 40% for the secondary factor. Equation 2, which is used to determine the total value, is as follows:

$$N = (x\ (x1)\%.\ NCF\ +\ (x2)\%.\ NSF \quad (2)$$

Where N is the total value, $(x_i)\%$ is the percent value, NCF is the average core factor value, and NSF is the average secondary factor value.

e) Ranking

Calculating the ranking score of the candidates to be recommended is the last step in the profile matching model computation procedure. Equation 3 can be used to calculate the ranking score.

$$Ranking\ = ((x_1)\%.\ N_1) + ((x_2)\%.\ N_2) + ... + (x_n)\%.\ N_n) \quad (3)$$

Where $(x_1)\%$ is the weight of the percent value entered, N_1 is the final value of the 1st parameter, N_2 is the final value of the 2nd parameter, and N_n is the final value of the nth parameter.

2.2 The Linear Interpolation Method

One of the easiest ways to determine a value on a graph with two points connected in a straight line is to use linear interpolation. Linear interpolation is a method used to determine the value between two ranges of values generated based on the equation function.

Linear interpolation connects two value points that have a linear relationship so that each point that is between two linear points can be determined (Sudipa, Wiguna, Putra, & Hardiatama, 2021) (Hartomo, 2006) assigns values to each class score using linear interpolation. For example, given two points (X_0, Y_0) and (X_1, Y_1). **Figure 2** shows a straight line that interpolates the points (X_0, Y_0) and (X_1, Y_1).

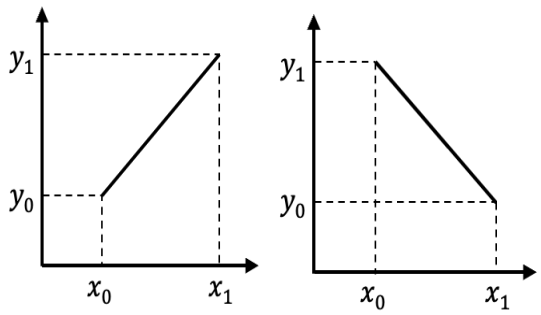
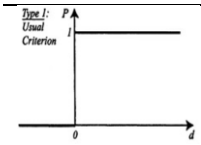
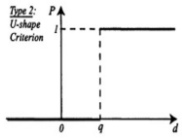
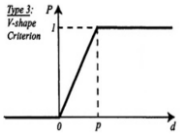
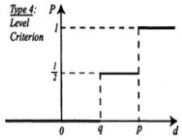
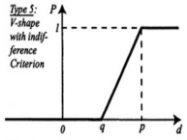
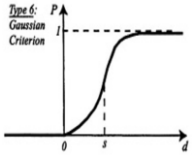


Figure 2. Linear Interpolation

Table 2. Preference Type

Type Criteria	Definition	Parameter
	$H(d) = \begin{cases} 0 & d \le 0 \\ 1 & d > 0 \end{cases}$	–
	$H(d) = \begin{cases} 0 & d \le q \\ 1 & d > q \end{cases}$	q
	$H(d) = \begin{cases} 0 & d \le 0 \\ \frac{d}{p} & 0 \le d \le p \\ 1 & d > p \end{cases}$	p
	$H(d) = \begin{cases} 0 & d \le q \\ 0{,}5 & q < d \le p \\ 1 & d > p \end{cases}$	p, q
	$H(d) = \begin{cases} 0 & d \le q \\ \frac{(d-q)}{(p-q)} & q < d \le p \\ 1 & d > p \end{cases}$	p, q
	$H(d) = \begin{cases} 0 & d \le 0 \\ 1 - e^{-\frac{d^2}{2s^2}} & d > 0 \end{cases}$	s

Equation 4, which represents the straight-line equation across the two points P1 (X_0, Y_0) and P2 (X_0, Y_1 can be used to find the linear interpolation equation.

So, we get the equation from linear interpolation in equation 5.

Where y is the point value being searched for, y_0 is the lower limit, y_1 is the highest threshold, x_0 is the minimum threshold of the range, and x_1 is the upper limit of the range.

2.3 Preference Ranking Organization Method for Enrichment Evaluation (PROMETHEE)

A technique for choosing the best option in a multicriteria analysis is called PROMETHEE. This method yields a ranking of the alternatives according to the chosen criteria (J. P. Brans & Vincke, 1985). The processes involved in calculating the PROMETHEE technique are as follows:

1) Determining Preference Type and Type of Assessment

Each selected criterion is given a more fitting description based on the preference type. (Jean Pierre Brans, Mareschal, Figueira, & Greco, 2005) proposed six basic types to help select certain preference functions, which are listed in **Table 2**. The threshold, or indifference, is denoted by the parameter q. The strong preference threshold is denoted by the value p. A value between q and p makes up the parameter s.

The highest divergence that the decision-maker deems insignificant is known as the indifference threshold (q parameter), while the smallest deviation that is thought to be necessary to attain complete popularity is known as the preference threshold (p parameter) (Jean Pierre Brans et al., 2005).

2) Calculating Preference Values

The function $P_i(A_j, A_k)$ shows how much preference alternative A_j has over alternative Ak on criterion C_i. The magnitude of the preference value can be described in equation 6.

$P_i(A_j, A_k) = 0$,	indicates that A_j and A_k are the same (indifferent)	(6)
$P_i(A_j, A_k) \approx 0$,	indicates feeble preferences	
$P_i(A_j, A_k) \approx 1$,	indicates a powerful preference	
$P_i(A_j, A_k) = 1$,	this suggests that the A_j preference is far superior to the A_k	

$$\frac{y - y_0}{y_1 - y_0} = \frac{x - x_0}{x_1 - x_0} \quad (4)$$

$$y = \frac{x - x_0}{x_1 - x_0}(y_1 - y_0) + y_0 \quad (5)$$

3) Calculating the Multicriteria Preference Indeks

The multicriteria preference index ($\pi(A_j, A_k)$) indicates how much alternative A_j outperforms alternative A_k based on all criteria. Equation 7 calculates the multicriteria preference index value (J. P. Brans & Vincke, 1985):

$$\pi(A_j, A_k) = \sum_{i=1}^{n} \pi\, P_i(A_j, A_k)\,, \forall A_j, A_k \in A \qquad (7)$$

4) Calculate Leaving Flow, Entering Flow, And Net Flow.

Leaving flow (φ^+(a)) is utilized to decide the priority order in the PROMETHEE I process, which operates in partial order. Determining the leaving flow value can be done using equation 8.

$$\Phi^+ = \frac{1}{n-1} \sum_{x \in A} \varphi(a, x) \qquad (8)$$

Entering flow (φ^-(a)) is utilized to decide the priority order in the PROMETHEE I process, which operates in partial order or complete order in the PROMETHEE II process in possible alternatives. To determine the entering flow value, use equation 9.

$$\Phi^- = \frac{1}{n-1} \sum_{x \in A} \varphi(x, a) \qquad (9)$$

Net flow (φ (a)) is utilized to make the ultimate decision on the sequence in which to solve the problem, resulting in a full sequence. Determining the net flow value can be done using equation 10.

$$\Phi(a) = \Phi^+(a) - \Phi^-(a) \qquad (10)$$

Where $\varphi(a,x)$ indicates that alternative an is preferable to alternative x, and $\varphi(x,a)$ indicates that alternative x is preferable to alternative a.

3. RESULTS AND DISCUSSIONS

3.1 Requirements Analysis

In this research, the parameters used for accepting new employees are the requirements aspect, the work attitude aspect, and the discipline aspect. A detailed description and value of each parameter is seen in **Table 3**.

Table 3. Parameter and Sub Parameter

Parameter	Parameter Weight	Sub Parameters	Sub-parameter weight
Requirements Aspect	25	Last education	6
		Age	3
		Skill	9
		Work experience	8
		Distance from home	4
Work Attitude Aspects	10	Accuracy	3
		Honesty	5
		Teamwork	5
		Communicative	3
Disciplinary Aspects	10	Courtesy	3
		Responsibility	5
		Dress neatly	2
		Arrive on time	3

Table 4. Prospective Employee Criteria Value

Alternative	Sub Parameters												
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
A1	S1	20 years old	2	0 year	4 km	3	2	2	3	3	2	4	1
A2	S1	22 years old	3	1 year	6 km	3	2	2	2	2	2	2	3
A3	D3	23 years old	1	2 years	3 km	4	3	3	2	4	2	3	2
A4	S1	27 years old	3	3 years	5 km	3	2	2	3	3	3	2	3
A5	S1	24 years old	2	2 years	3 km	4	3	2	4	2	3	1	3

Alternative	Sub Parameters												
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
A6	D1	20 years old	1	0 year	7 km	3	3	3	2	4	3	3	2
A7	SMA	19 years old	0	0 year	2 km	2	3	2	1	3	3	3	3
A8	SMA	21 years old	1	2 years	4 km	3	3	3	1	4	3	3	3
A9	S1	25 years old	1	1 year	5 km	4	3	3	1	1	3	4	2
A10	S1	25 years old	3	3 years	3 km	3	2	2	3	4	3	3	3
A11	D1	22 years old	1	1 year	5 km	3	3	2	4	3	3	2	3
A12	SMA	21 years old	2	2 years	4 km	2	2	3	2	3	3	3	3

In this research, the employee recruitment process was carried out on 12 prospective employee data points. The subparameter values of the 12 prospective employees is seen in **Table 4**. After getting the weight of each parameter and sub-parameter in Table II, the normalized weight value of each parameter and sub-parameter is calculated using equation 11.

$$W_A^1 = \frac{W_A}{\sum_{A=1}^{n} W_A} \quad (11)$$

Where W_A^1 = is the normalized weight, W_A = is the normalized weight, n = is the number of parameters or sub-parameters.

After getting the normalized weight value, the next step is to calculate the profile matching, with the initial step being to calculate the gap value according to the formula in equation 1. After getting the gap value, we will continue calculating the score for each gap value using the linear interpolation method according to equation 5. Calculation results using the profile matching method produce a score for each subparameter.

3.2. System Implementation

The implementation of this system discusses the display of the SPK interface for accepting new employees that have been created

1) Parameter Data Page

This page describes the parameters used in the employee selection process, which include serial numbers, parameter codes, parameter descriptions, and weights indicating the level of importance of each parameter. The parameter data page is presented in **Figure 3**.

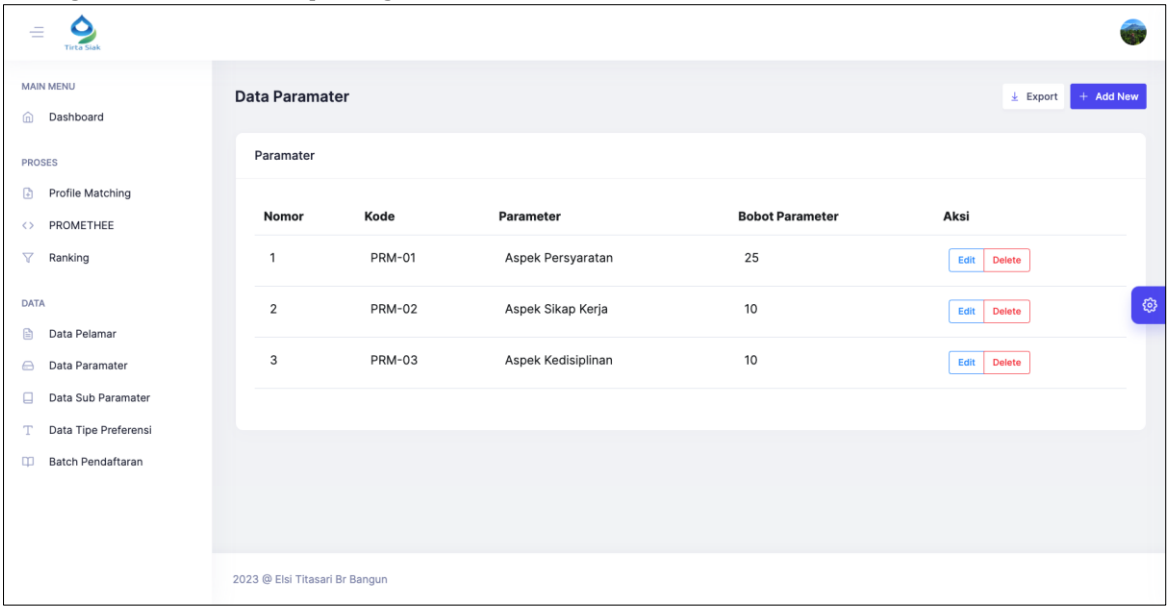


Figure 3. Parameter Data Display

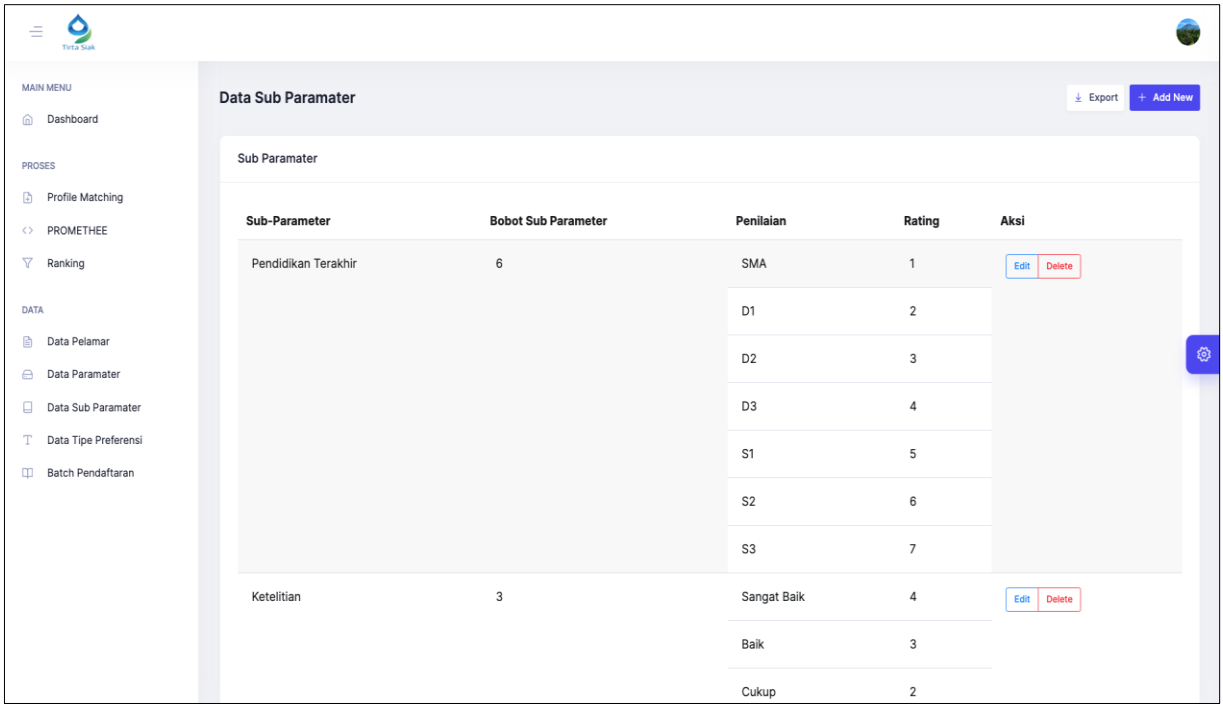


Figure 4. Sub Parameter Data Display

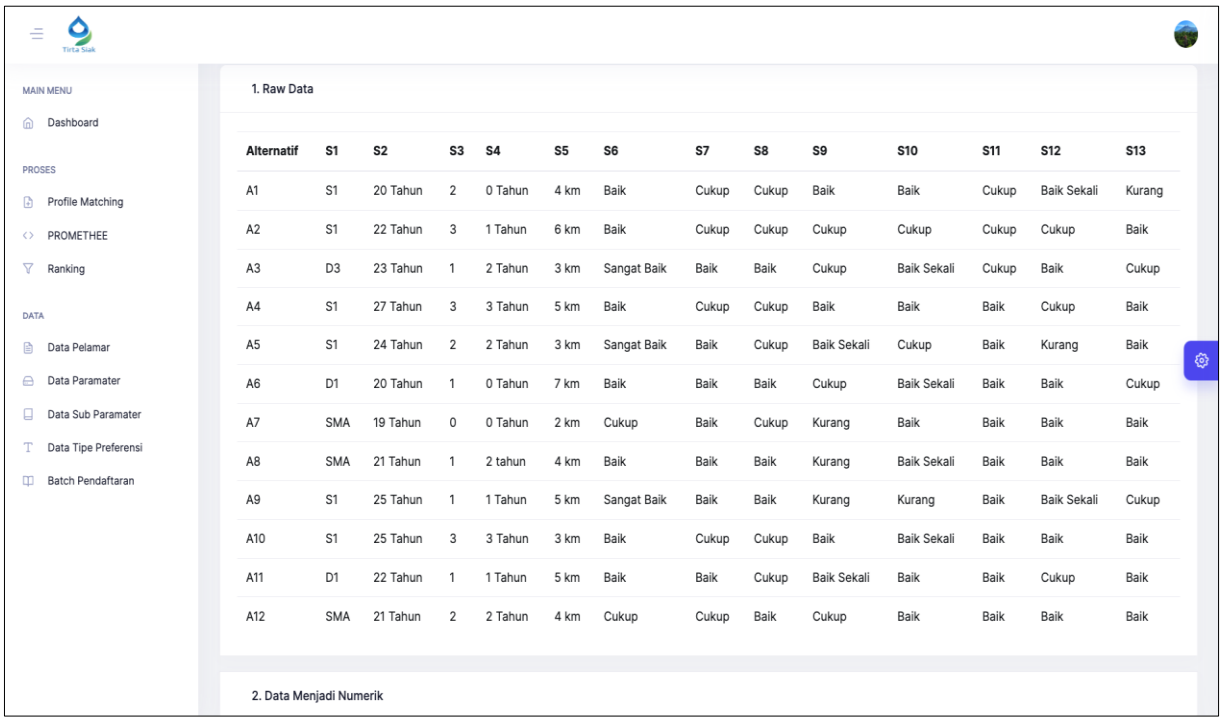
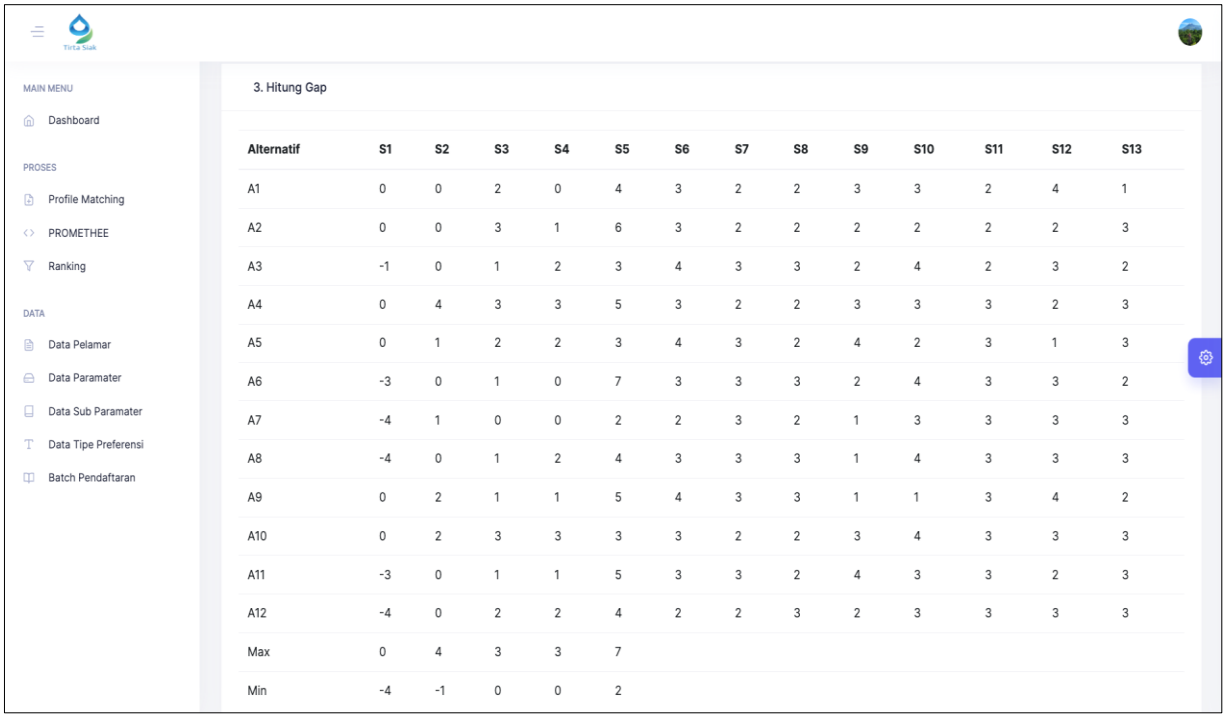
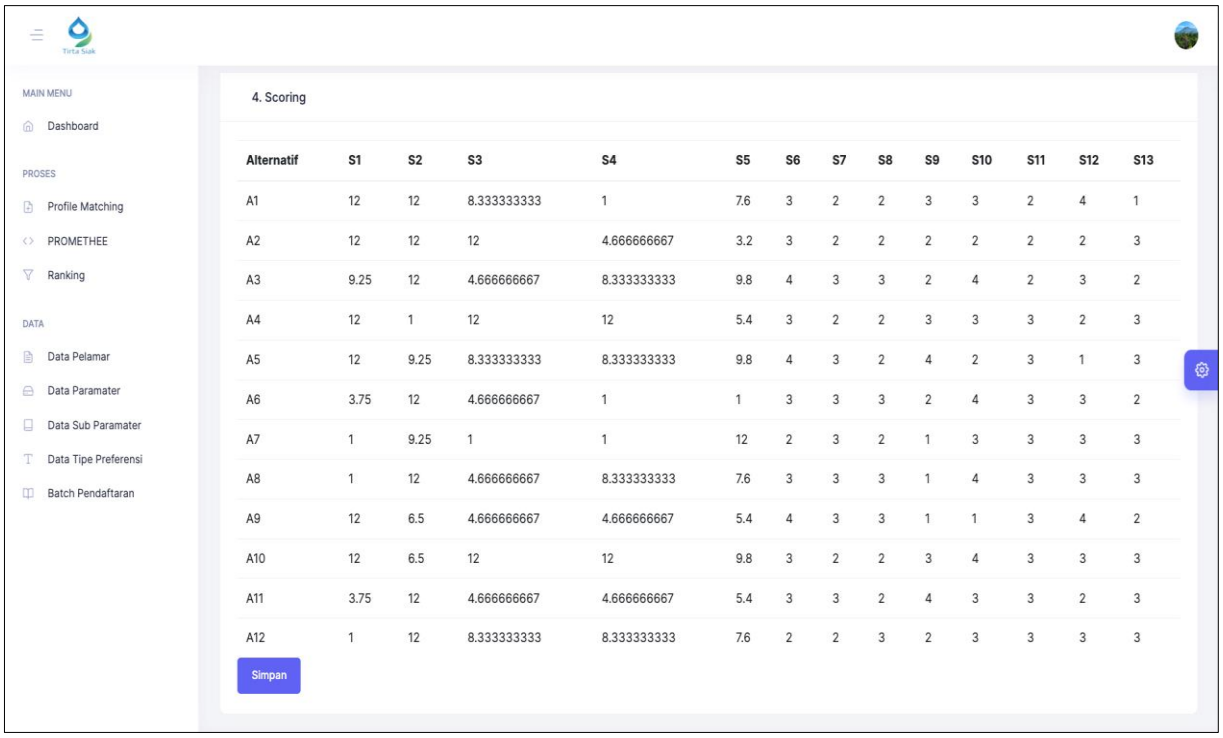


Figure 5. Raw Data Profile Matching Display



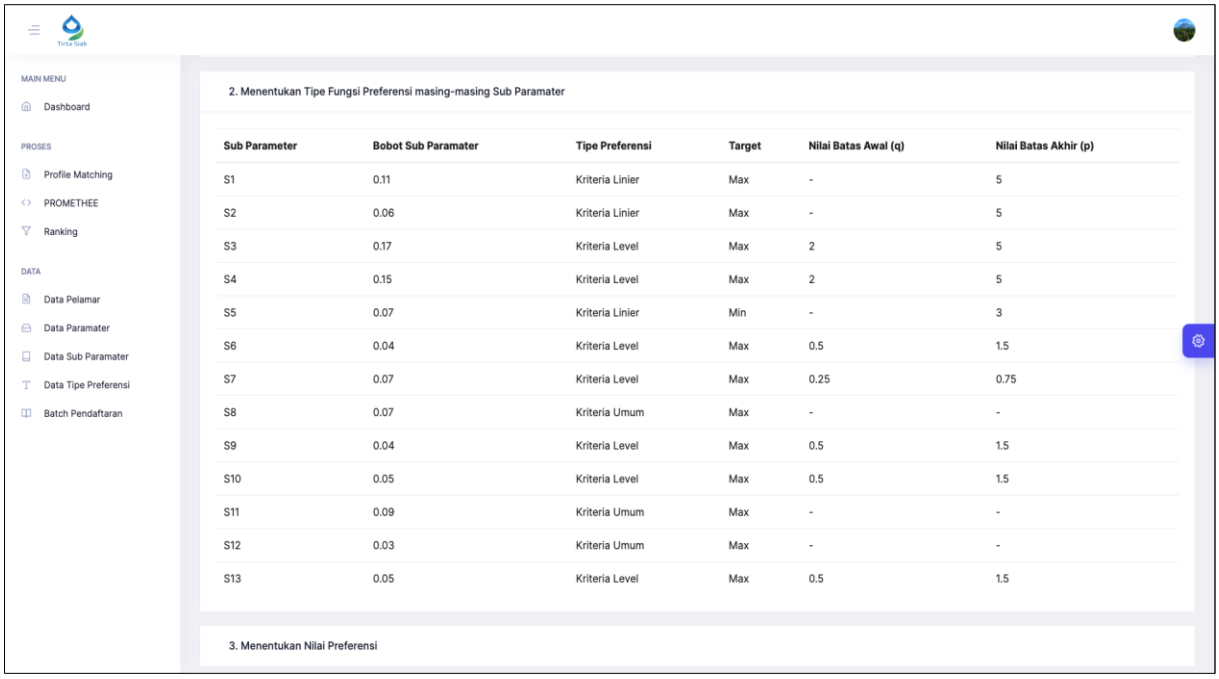
Alternatif	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
A1	0	0	2	0	4	3	2	2	3	3	2	4	1
A2	0	0	3	1	6	3	2	2	2	2	2	2	3
A3	-1	0	1	2	3	4	3	3	2	4	2	3	2
A4	0	4	3	3	5	3	2	2	3	3	3	2	3
A5	0	1	2	2	3	4	3	2	4	2	3	1	3
A6	-3	0	1	0	7	3	3	3	2	4	3	3	2
A7	-4	1	0	0	2	2	3	2	1	3	3	3	3
A8	-4	0	1	2	4	3	3	3	1	4	3	3	3
A9	0	2	1	1	5	4	3	3	1	1	3	4	2
A10	0	2	3	3	3	3	2	2	3	4	3	3	3
A11	-3	0	1	1	5	3	3	2	4	3	3	2	3
A12	-4	0	2	2	4	2	2	3	2	3	3	3	3
Max	0	4	3	3	7								
Min	-4	-1	0	0	2								

Figure 6. Gap Calculation Display



Alternatif	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13
A1	12	12	8.333333333	1	7.6	3	2	2	3	3	2	4	1
A2	12	12	12	4.666666667	3.2	3	2	2	2	2	2	2	3
A3	9.25	12	4.666666667	8.333333333	9.8	4	3	3	2	4	2	3	2
A4	12	1	12	12	5.4	3	2	2	3	3	3	2	3
A5	12	9.25	8.333333333	8.333333333	9.8	4	3	2	4	2	3	1	3
A6	3.75	12	4.666666667	1	1	3	3	3	2	4	3	3	2
A7	1	9.25	1	1	12	2	3	2	1	3	3	3	3
A8	1	12	4.666666667	8.333333333	7.6	3	3	3	1	4	3	3	3
A9	12	6.5	4.666666667	4.666666667	5.4	4	3	3	1	1	3	4	2
A10	12	6.5	12	12	9.8	3	2	2	3	4	3	3	3
A11	3.75	12	4.666666667	4.666666667	5.4	3	3	2	4	3	3	2	3
A12	1	12	8.333333333	8.333333333	7.6	2	2	3	2	3	3	3	3

Figure 7. Scoring Display



Sub Parameter	Bobot Sub Paramater	Tipe Preferensi	Target	Nilai Batas Awal (q)	Nilai Batas Akhir (p)
S1	0.11	Kriteria Linier	Max	-	5
S2	0.06	Kriteria Linier	Max	-	5
S3	0.17	Kriteria Level	Max	2	5
S4	0.15	Kriteria Level	Max	2	5
S5	0.07	Kriteria Linier	Min	-	3
S6	0.04	Kriteria Level	Max	0.5	1.5
S7	0.07	Kriteria Level	Max	0.25	0.75
S8	0.07	Kriteria Umum	Max	-	-
S9	0.04	Kriteria Level	Max	0.5	1.5
S10	0.05	Kriteria Level	Max	0.5	1.5
S11	0.09	Kriteria Umum	Max	-	-
S12	0.03	Kriteria Umum	Max	-	-
S13	0.05	Kriteria Level	Max	0.5	1.5

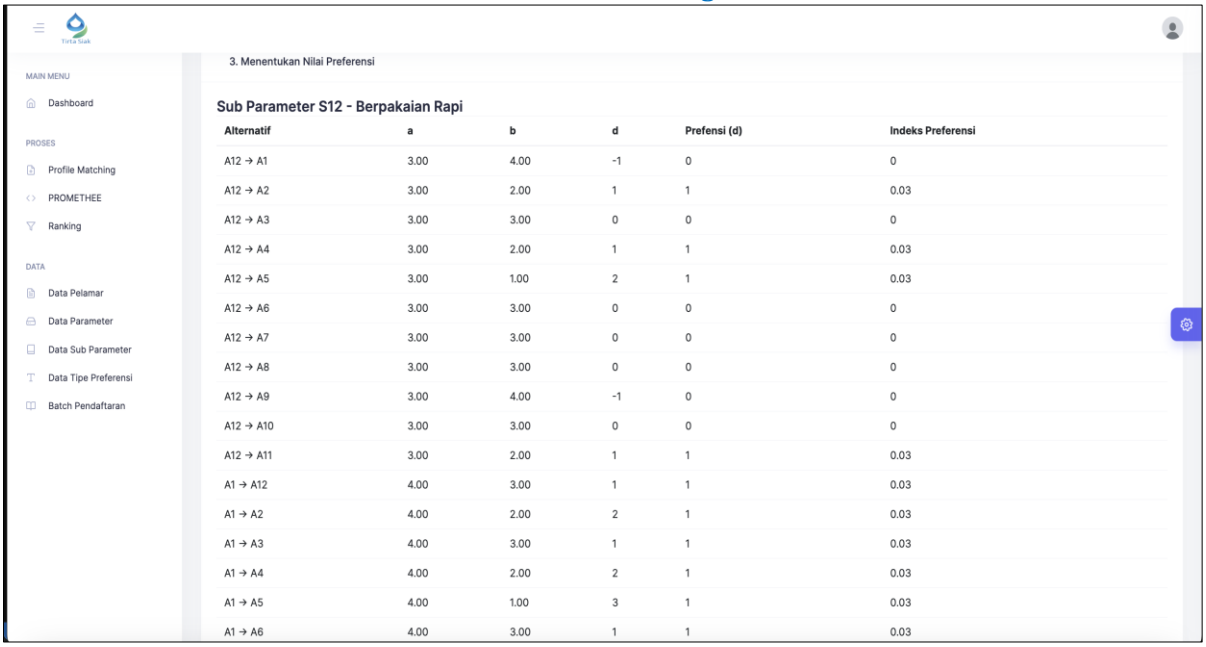
Figure 8. Preference Type Display

2) Sub Parameter Data Page

This page details the sub-parameters used in assessing applicants, where each sub-parameter is given a certain weight that shows its contribution to the overall assessment. The sub parameter data page is presented in **Figure 4**.

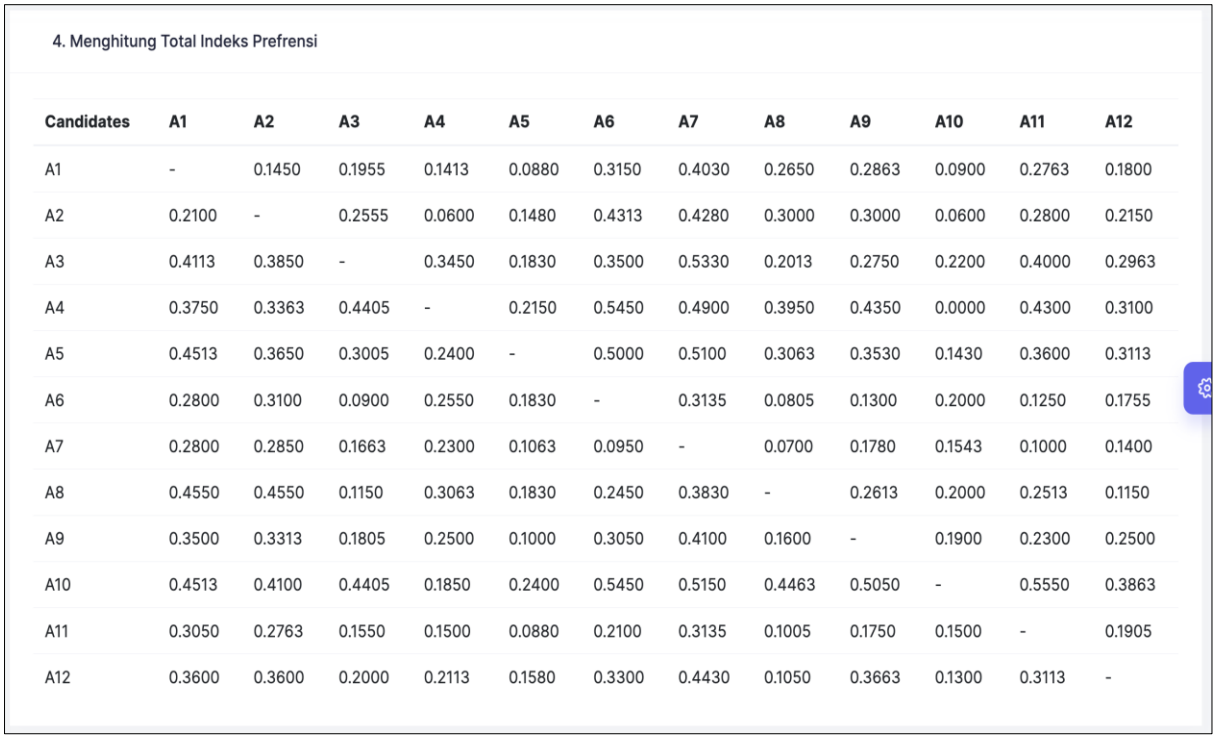
3) Raw Data Profile Matching Page

This display outlines a series of attributes or assessment criteria consisting of recent education, work experience, and various other performance aspects that are rated from very good to poor. The raw data page is presented in **Figure 5**.



Alternatif	a	b	d	Prefensi (d)	Indeks Preferensi
A12 → A1	3.00	4.00	-1	0	0
A12 → A2	3.00	2.00	1	1	0.03
A12 → A3	3.00	3.00	0	0	0
A12 → A4	3.00	2.00	1	1	0.03
A12 → A5	3.00	1.00	2	1	0.03
A12 → A6	3.00	3.00	0	0	0
A12 → A7	3.00	3.00	0	0	0
A12 → A8	3.00	3.00	0	0	0
A12 → A9	3.00	4.00	-1	0	0
A12 → A10	3.00	3.00	0	0	0
A12 → A11	3.00	2.00	1	1	0.03
A1 → A12	4.00	3.00	1	1	0.03
A1 → A2	4.00	2.00	2	1	0.03
A1 → A3	4.00	3.00	1	1	0.03
A1 → A4	4.00	2.00	2	1	0.03
A1 → A5	4.00	1.00	3	1	0.03
A1 → A6	4.00	3.00	1	1	0.03

Figure 9. Preference Value Display



4. Menghitung Total Indeks Prefrensi

Candidates	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
A1	-	0.1450	0.1955	0.1413	0.0880	0.3150	0.4030	0.2650	0.2863	0.0900	0.2763	0.1800
A2	0.2100	-	0.2555	0.0600	0.1480	0.4313	0.4280	0.3000	0.3000	0.0600	0.2800	0.2150
A3	0.4113	0.3850	-	0.3450	0.1830	0.3500	0.5330	0.2013	0.2750	0.2200	0.4000	0.2963
A4	0.3750	0.3363	0.4405	-	0.2150	0.5450	0.4900	0.3950	0.4350	0.0000	0.4300	0.3100
A5	0.4513	0.3650	0.3005	0.2400	-	0.5000	0.5100	0.3063	0.3530	0.1430	0.3600	0.3113
A6	0.2800	0.3100	0.0900	0.2550	0.1830	-	0.3135	0.0805	0.1300	0.2000	0.1250	0.1755
A7	0.2800	0.2850	0.1663	0.2300	0.1063	0.0950	-	0.0700	0.1780	0.1543	0.1000	0.1400
A8	0.4550	0.4550	0.1150	0.3063	0.1830	0.2450	0.3830	-	0.2613	0.2000	0.2513	0.1150
A9	0.3500	0.3313	0.1805	0.2500	0.1000	0.3050	0.4100	0.1600	-	0.1900	0.2300	0.2500
A10	0.4513	0.4100	0.4405	0.1850	0.2400	0.5450	0.5150	0.4463	0.5050	-	0.5550	0.3863
A11	0.3050	0.2763	0.1550	0.1500	0.0880	0.2100	0.3135	0.1005	0.1750	0.1500	-	0.1905
A12	0.3600	0.3600	0.2000	0.2113	0.1580	0.3300	0.4430	0.1050	0.3663	0.1300	0.3113	-

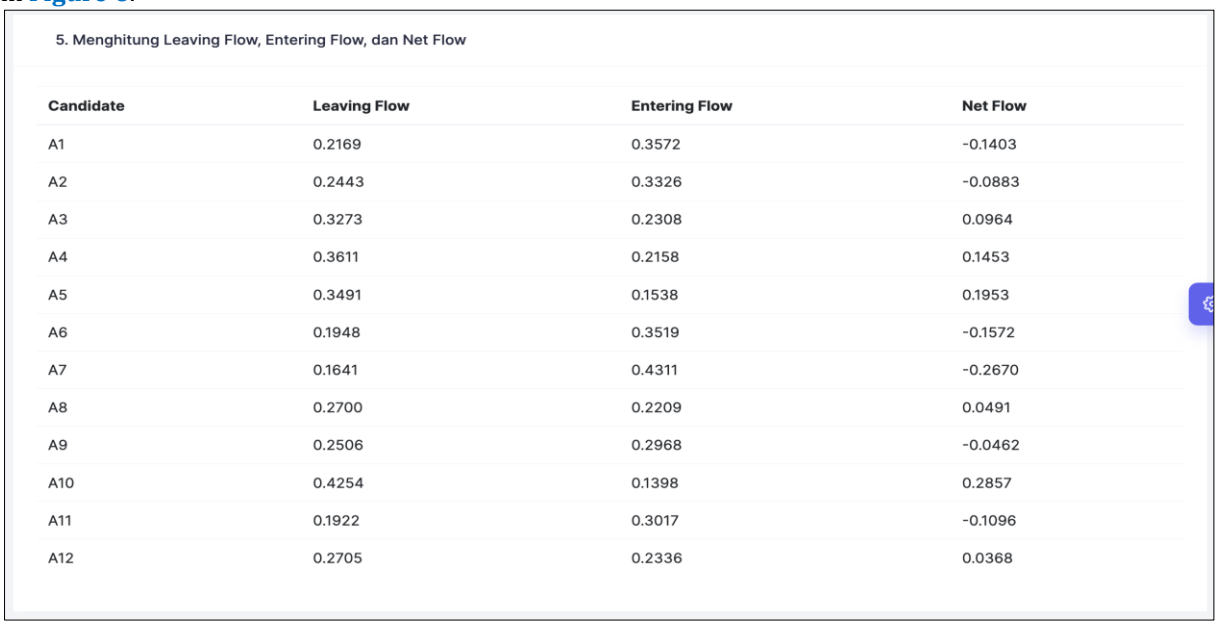
Figure 10. Preference Index Display

4) Gap Calculation Page

This process calculates the difference or gap between the criteria expected by the company and the criteria possessed by each applicant. The gap calculation page is presented in **Figure 6**.

5) Scoring Page

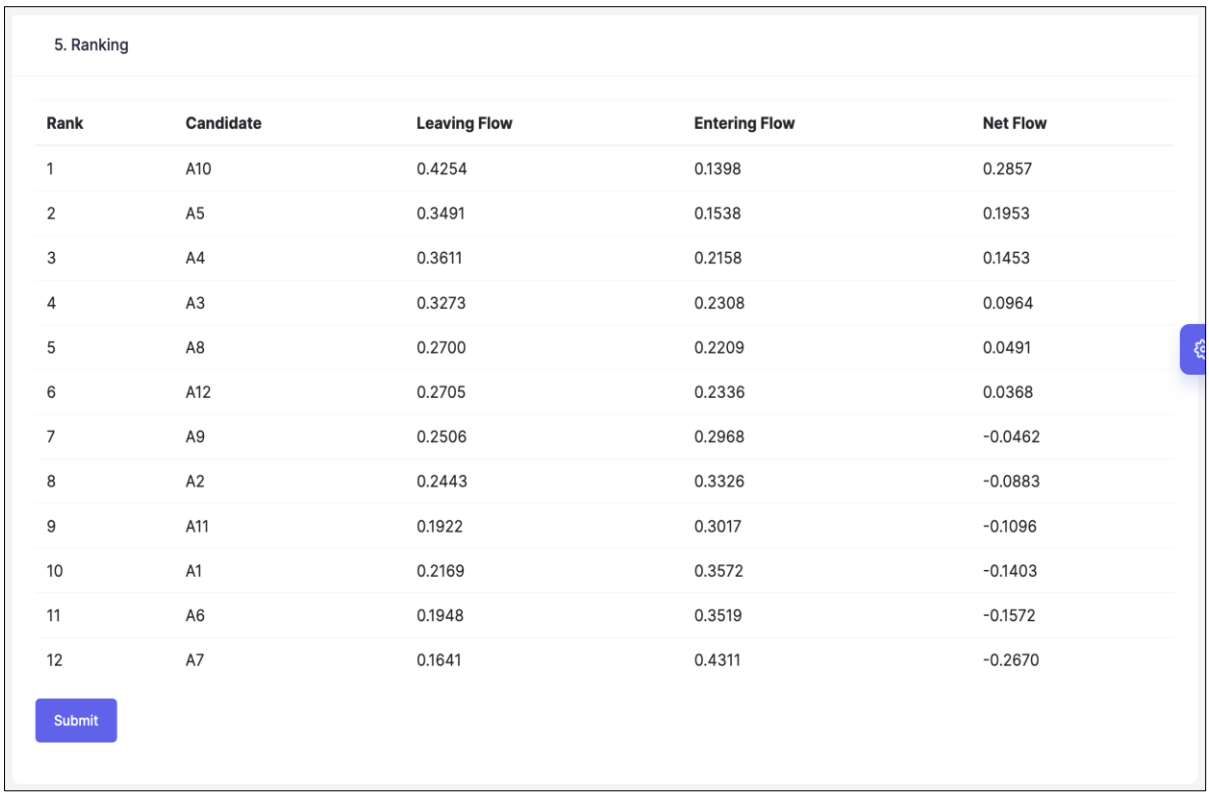
This page presents the numerical scores that have been calculated for each sub-parameter of the applicant (alternatives A1 to A12). The gap calculation page is presented in **Figure 7**.



5. Menghitung Leaving Flow, Entering Flow, dan Net Flow

Candidate	Leaving Flow	Entering Flow	Net Flow
A1	0.2169	0.3572	-0.1403
A2	0.2443	0.3326	-0.0883
A3	0.3273	0.2308	0.0964
A4	0.3611	0.2158	0.1453
A5	0.3491	0.1538	0.1953
A6	0.1948	0.3519	-0.1572
A7	0.1641	0.4311	-0.2670
A8	0.2700	0.2209	0.0491
A9	0.2506	0.2968	-0.0462
A10	0.4254	0.1398	0.2857
A11	0.1922	0.3017	-0.1096
A12	0.2705	0.2336	0.0368

Figure 11. Display of leaving flow, entering flow, and net flow


5. Ranking

Rank	Candidate	Leaving Flow	Entering Flow	Net Flow
1	A10	0.4254	0.1398	0.2857
2	A5	0.3491	0.1538	0.1953
3	A4	0.3611	0.2158	0.1453
4	A3	0.3273	0.2308	0.0964
5	A8	0.2700	0.2209	0.0491
6	A12	0.2705	0.2336	0.0368
7	A9	0.2506	0.2968	-0.0462
8	A2	0.2443	0.3326	-0.0883
9	A11	0.1922	0.3017	-0.1096
10	A1	0.2169	0.3572	-0.1403
11	A6	0.1948	0.3519	-0.1572
12	A7	0.1641	0.4311	-0.2670

Submit

Figure 12. Ranking Display

6) Preference Type Page

This page details each sub-parameter that is assessed, the relative weight given to each sub-parameter, and the type of preference function that applies. This preference function is used to evaluate how much preference one alternative has over another alternative based on certain sub-parameters. The preference type page is presented in **Figure 8**.

7) Preference Values Page

This page displays a one-by-one comparison between alternatives according to the sub-parameters that have been determined. The preference value page is presented in **Figure 9**.

8) Preference Index Page

This page shows a pairwise comparison between each applicant's alternatives, with numbers reflecting how preferential one alternative is compared to another based on a predefined set of criteria. A larger value indicates a higher degree of preference for the alternative in that row compared to the alternative in the corresponding column. The preference index page is presented in **Figure 10**.

9) Leaving Flow, Entering Flow, And Net Flow Pages

This page presents the ranking results in the evaluation system using the PROMETHEE methodology by sorting candidates based on net flow, which is the difference between leaving flow and entering flow. The leaving flow, entering flow, and net flow pages are presented in **Figure 11**.

10) Ranking Page

The candidate with the highest positive net flow is placed at the top rank, indicating the highest preference in the context of that evaluation, while a negative net flow value indicates a lower rank. The ranking page is presented in **Figure 12**.

The developed decision support system has a number of benefits, including the capacity to manage modifications to data structures, a sign of the system's adaptability to data changes, a range of preference types which are anticipated to be

able to conform to the specifics of each criterion, and computational efficiency in computations that yield results identical to those of manual calculations.

4. CONCLUSIONS

Implementation of the Decision Support System in Perumdam Tirta Siak using the profile matching method and PROMETHEE proved to be successful in dealing with the problem of recruitment of new employees. This system facilitates decision-makers in setting evaluation parameters accurately, making the selection process more objective and transparent.

The flexibility shown by the system in the face of alternative changes and evaluation parameters is also an important point that reinforces its effectiveness. Test results show that the system has a solid ability to make consistent and precise rankings of prospective employees, confirming that it has great potential as a valuable tool in the recruitment process at Perumdam Tirta Siak.

These conclusions provide an overview of the system's success in providing efficient and effective solutions to the challenges faced by the company in hiring employees. Based on the study's findings, a number of recommendations for additional research have been made. It is advised to start by looking at the application of additional decision analysis techniques in order to improve the system and boost precision during the onboarding of new employees.

Second, in addition to the normalizing approach that has been employed, it is imperative to explore the possibility of utilizing an alternative parameter weight calculation method, such as the AHP method. Third, in order to improve the system's intuitiveness and responsiveness to decision-makers' demands, additional development of the user interface and system functionality is required.

REFERENCES

Atmaja, N. S. (2021). Sistem Pendukung Keputusan Sistem Pendukung Keputusan Pemilihan Jurusan Menggunakan Metode PROMETHEE (Studi Kasus : SMK Negeri 6 Medan). *Jurnal Nasional Informatika danTeknologi Jaringan*, *5*(2), 355–364. Retrieved from https://doi.org/10.30743/infotekjar.v5i2.3575

Brans, J. P., & Vincke, Ph. (1985). A Preference Ranking Organisation Method (The PROMETHEE Method for Multiple Criteria Decision-Making). *Management Science*, *31*(6), 647–656. Institute for Operations Research and the Management Sciences (INFORMS). http://dx.doi.org/10.1287/mnsc.31.6.647

Brans, Jean Pierre, Mareschal, B., Figueira, J. R., & Greco, S. (2005). Promethee Methods. *International Series in Operations Research and Management Science* (Vol. 78, pp. 163–195). Springer New York LLC. http://dx.doi.org/10.1007/0-387-23081-5_5

Hartomo, K. D. (2006). Implementasi Metode Interpolasi Linier untuk Pembesaran Resolusi Citra. *TEKNOIN*, *11*, 219–232. https://doi.org/10.20885/.v11i3.89

Junaidi. (2021). Sistem Pendukung Keputusan Pembagian Kelas Unggulan Siswa Baru Menggunakan Metode Promethee Pada STM Raksana Medan. *JUKI : Jurnal Komputer dan Informatika*, *3*(1), 35–43. https://doi.org/10.53842/juki.v3i1.43

Kuswanto, J. (2020). Penerimaan Karyawan Baru Menggunakan Metode Profile Matching. *Jurnal Processor*, *15*(2), 85–97. LPPM STIKOM Dinamika Bangsa Jambi. https://doi.org/10.33998/processor.2020.15.2.831

Luthfiah, E., & Muslih, M. (2022). *Sistem Pendukung Keputusan Seleksi Calon Karyawan Menggunakan Penerapan Metode PROMETHEE II*. *Jurnal Sains Komputer & Informatika (J-SAKTI* (Vol. 6). http://dx.doi.org/10.30645/j-sakti.v6i1.462

Mahmudi, A. A. (2022). Sistem Pendukung Keputusan Rekrutmen Tenaga Kependidikan Menggunakan Metode Promethee. *CURTINA: Computer Science or Informatic Journal*, *3*(1), 52–62. https://doi.org/10.55719/curtina.v3i1.451

Oktawiana, N., Kosaman, R. W., Gunawan, S., Eko, S., & Sistem, J. (2020). Sistem Pendukung

Keputusan Penerimaan Karyawan Menggunakan Metode Profile Matching di PT Dragon Indonesia. *Jurnal Teknik Informatika*, *6*(1), 18–21.

Potale, B. R., Lengkong, V., & Moniharapon, S. (2016). Pengaruh Proses Rekrutmen dan Seleksi Terhadap Kinerja Karyawan Pada PT BANK SULUTGO. *Jurnal Berkala Ilmiah Efisiensi*, *16*(4), 453–464.

Pramana, H. J., Mufizar, T., Anwar, D. S., & Septianingrum, I. (2022). Sistem Pendukung Keputusan Penilaian Kinerja Guru Dengan Metode AHP dan PROMETHEE. *IT (Informatic Technique) Journal*, *10*(1), 87. University of Potensi Utama Medan. https://www.doi.org/10.22303/it.10.1.2022.87-99

Pratama, E. (2019). *Support System For Determining The Location Of Hotel Establishment Using Ahp Method And Promethee (Case Study: Solo City)*.

Sudipa, I. G. I., Wiguna, I. K. A. G., Putra, I. N. T. A., & Hardiatama, K. (2021). Implementasi Metode Analytical Hierarchy Process Dan Interpolasi Linier Dalam Penentuan Lokasi Wisata Di Kabupaten Karangasem. *Jurnal Sains Komputer & Informatika (J-SAKTI*, *5*(2), 866–878. http://dx.doi.org/10.30645/j-sakti.v5i2.383

Turban, E., Aronson, J. E., & Liang, T. P. (2007). *Decision Support Systems and Intelligent Systems, 7th Edition* (Vol. 7).

Wicaksono, M., & Lucky, M. I. (2023). Implementasi Metode PROMETHEE Pada Pemilihan Registrar Domain Di Indonesia. *Jurnal Ilmiah Informatika (JIF)*, 94–101. https://doi.org/10.33884/jif.v11i01.7174