Decision Support System For Training Provider Selection Using Profile Matching Method (Case Study: Pcu (Pertamina Corporate University)

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Abstract

The process of selecting training providers at PCU (Pertamina Corporate University) is currently not very effective and efficient, still relying on conventional methods that take a long time to choose a training provider, requiring one month for each training session. Conventional document collection by applicants can lead to the loss of documents, and there is no method in the selection of training providers, resulting in frequent occurrences of sole providers and difficulties in choosing providers for specific training needs. The research has led to the development of a web-based system using the Profile Matching method. The Profile Matching method was chosen because it involves determining competency values (standard assessment criteria) required for specific types of training, serving as a reference to evaluate selected provider candidates. This method selects the best alternative from various options by comparing the individual competencies of providers with the desired training profile values, resulting in competency differences (Gains Across Product). The smaller the GAP, the higher the weight of the score generated. Providers with the highest score have the highest ranking and a greater chance of being selected as training instructors at PCU. Data collection techniques used include observation and interviews.

Keywords: SPK, Profile Matching, selection of training providers, PCU

1. Introduction

Training is one of the activities that is useful for improving the quality of human resources at work, training is given to employees who have just been accepted into a company or employees who have worked in a company for a long time, is useful for providing instruction to employees regarding the basic skills needed when working, so that the performance carried out gets maximum results [1]. Training for employees carried out by PCU (Pertamina Corporate University) is a form of activity designed for self-development for employees so that employees have the ability, skills, experience, have a good work ethic in accordance with standards of expertise in the field of science and support performance in implementing work, as well as

producing maximum performance as expected by the company. Before the training is carried out, the PCU will look for Providers who will later provide material during the training, the process of appointing Providers who will be selected is based on Beauty Contest activities. The Beauty Contest activity is an activity to select training providers, aimed at selecting training providers based on aspects of the criteria determined by PCU

Providers training is an external party from a business entity or business, which provides training and teaching to certain parties in carrying out training. Provider selection will have a direct influence and impact on the cost, quality, time and quality of human resources taught. Provider selection is determined based on certain aspects and criteria determined by each company. Provider selection is the first step in getting quality and qualified providers before carrying out training, with an assessment of Provider selection providing an overview of the best Provider that will be selected and knowing which Provider has the best quality for the company in carrying out training [2].

The selection of training providers has been ineffective and inefficient so far because for one type of training, it takes one month to reach the training preparation stage. The lengthy selection process renders the conventional training provider selection process inefficient as PCU conducts in-house training 205 times each year. Additionally, the document submission phase is still carried out conventionally, where the collection process involves sending hard copy documents to PCU, posing a risk of document loss.

The announcement of accepted training providers is still done conventionally, where the Training Educational Program (TEP) contacts potential providers one by one for each training. This method is considered ineffective due to difficulties in finding providers suitable for the intended training, frequent lack of providers for specific training, and the occurrence of sole providers, where only one provider is available for a training, preventing the negotiation of the best price and competitive bids. Furthermore, the evaluation process is not systematic and lacks a method in selecting training instructors. Therefore, a decision support method is needed to assist PCU (Pertamina Corporate University) in accurately and precisely selecting providers based on predetermined aspects and criteria. Based on the aforementioned issues, the author has designed a decision-making system for selecting training providers to streamline the provider determination process. The system is capable of processing data more quickly and accurately, making decision-making easier. This system is referred to as a Decision Support System (DSS) and helps in decision-making by the Training Educational Program (TEP) to find the best training providers.

The system is web-based and utilizes the Profile Matching method. The Profile Matching method is chosen because it ranks providers based on the final score from the highest total assessment of the registered providers. This method involves first determining the competency values (standard assessment criteria) required for a specific type of training, serving as a reference for evaluating the selected provider candidates. The method then selects the best alternative from a pool of alternatives by comparing the individual competencies of providers with the profile values of the intended training. This reveals the competency differences, referred to as Gains Across Product (GAP). The smaller the GAP, the larger the weight of the value; thus, providers with higher weighted scores have a better chance of being selected as training instructors at PCU (Pertamina Corporate University).It is expected that the development of this system will assist PCU in selecting providers for each training and provide a list of recommended providers to serve as instructors for each type of training conducted by PCU.

A Decision Support System (DSS) is a computer-based information system that can be used to make decisions in a company organization and on daily life problems as well as managing data with various models [3]. Decision Support Systems can be used to solve problems in the real world, one of which is the problem of selecting training providers at PCU (Pertamina Corporate University), where using a decision support system in selecting training providers is expected to help PCU (Pertamina Corporate University) in Select the provider for each training that will be carried out using existing data from PCU (Pertamina Corporate University). The implementation of a Decision Support System can help improve the quality of decisions taken [4].

The Profile Matching method is a Decision Support System method which works by comparing GAP (Gains Across Products) between Alternative and criterion values. There are several things that are known about GAP Analysis, one of which is the GAP weight value table (Gains Across Products). Apart from that, GAP analysis (Gains Across Products) You must also understand the concept of Priority Scale [5].

Profile Matching is a method that is often used as a mechanism for decision making by assuming that there is an ideal level of predictor variables that must be met by the subject under study, not a minimum level that must be met or exceeded. The outline of the Profile Matching process compares the actual data value of a profile that will be assessed with the expected profile value [6].

Researchers cited several previous journals as references in conducting research using the Profile Matching method. The first research was to use the Profile Matching Method to recruit new employees based on the ranking of applicants who applied. The use of this method can help and simplify the decision-making process and provide solutions to the problems faced [7]

The second research is the Decision Support System for appointing permanent instructors at the Karya Prima course and training institution using the Profile Matching Method. Karya Prima course institutions still use manual methods in determining the selection of course instructors, making it difficult to determine instructors through manual calculations. The implementation of a Decision Support System using the Profile Matching method in the determination system is very helpful for the management of Course Institutions in making decisions on determining teachers based on predetermined assessment criteria [8].

The third research is the application of the Profile Matching method in selecting badminton rackets based on consumers. This research aims to provide a reference to consumers to determine the right racket brand. The use of the Profile Matching method in the Decision Support System provides recommendations and suggestions to consumers to determine the right badminton racket. The highest ranking was Adidas (S4) with a final score of 81.95 and followed by Li Ning (S3) with a final score of 78.225 [9].

The fourth research was determining the OSIS chairman using the Profile Matching method at SMK Cengkareng 1 West Jakarta. The use of the Profile Matching method in the OSIS chairman selection system helps the school's performance in selecting the new OSIS chairman and has an influence in determining using the Profile Matching method, according to existing criteria, which makes the determination faster and more accurate. Based on the results obtained, the top ranking was Putri Kusumawati with a final score of 4.75. The aspects used were behavioral aspects, intellectual aspects, responsibility aspects, communication aspects and creativity aspects [10].

The fifth research is the Decision Support System for selecting job applicants at BNI Life Insurance using the Object Oriented Profile Matching method. This research discusses how BNI's selection of new employees has been done manually, which is considered less appropriate and effective because it takes a long time. Using the Profile Matching method in the SPK for selecting new employees helps BNI because this method produces a ranking of all applicants, participants who get the top ranking are recommended to qualify as employees. The use of the method speeds up the process of selecting job applicants because the calculations are carried out by the system so that it will reduce delays in decision making [11].

The sixth research is a decision support system for selecting Indonesian workers (TKI) based on quality to determine workplaces using the Profile Matching method at PT Adila Prezkifarindo Duta. This research discusses how to select Indonesian Workers (TKI), so far they still use conventional methods, resulting in the selection taking a long time to evaluate and the selection being carried out being less effective. Having a system can help selectors selecting TKI (Indonesian Workers) get accurate results, more effectively and efficiently. The selection is carried out based on the final score ranking of applicants, the applicant with the highest score is selected to be the TKI candidate who will be proposed [12].

2. Research Methods

The research was conducted at PCU (Pertamina Corporate University). The system built is website-based and uses the Profile Matching method. The reason the Profile Matching method was chosen is because the advantage of this method is that it produces a ranking based on the final value of the highest total assessment from the registered Providers. This method is a method where we first have to determine the competency values (standard assessment criteria) required for a type of training. These competencies become a reference in assessing the selected prospective provider. This method will select the best alternative from a number of alternatives, which will compare the individual competency of the Provider with the profile value of the type of training to be implemented, so that the difference in competency can be known, which is called the term GAP (Gains Across Product). The smaller the GAP (Gains Across Product) produced, the greater the value weight. Providers who have a large value weight mean they have the opportunity to be selected as training providers at PCU (Pertamina Corporate University) [13].

2.1. Method of collecting data
a) Interview

Namely collecting data by having direct conversations with sources, namely the PCU, especially the TEP function which implements and selects providers.
b) Observation

Is a method of seeking detailed and actual information from the place where the research is being carried out, carried out by examining all matters related to the research material.

2.2. Profile Matching

The Profile Matching method is a method that is often used for decision making, where in this method there is an ideal level of predictor variables that must be met by the subject under study, rather than a minimum level that must be met or exceeded. In general, the Profile Matching process is a process of comparing the actual data value of a profile to be assessed with the expected profile value, so that differences in competency or called GAP (Gains Across Product), if the resulting GAP (Gains Across Product) value is small then the weight of the value obtained will be large, so that the Provider. Profile Matching consists of several stages including:

a) Determining Aspects and Assessment Criteria

This is the first stage in using Profile Matching. In selecting a training teacher provider, 2 aspects of criteria are used, namely subjective, consisting of reputation criteria, expert judgment, and objective aspects consisting of material criteria, trainer, provider legal entity specialist and negotiation price.

b) Competency GAP (Gains Across Product) Mapping

This stage is to determine the difference between the provider's criteria value minus the training type's criteria value. The formula for finding GAP (Gains Across Product) competency is as follows:

$$GAP = \text{Value of the candidate provider's profile} - \text{Ideal Provile Value}$$

c) Weighting

After obtaining the GAP (Gains Across Product), the next step is to weight the Providers who register. The weighting is carried out based on the reference table 1 of the GAP value weights below:

Table 1. GAP Value Weighting Table

No	Difference	Value Weight	Information
1	0	5	There is no difference (competency) according to what is required)

No	Difference	Value Weight	Information
2	1	4.5	Individual competency exceeds 1 level level
3	-1	4	Individual competency deficiency -1 level level
4	2	3.5	Individual competency is superior to 2 levels
5	-2	3	Individual competency deficiency -2 level levels
6	3	2.5	Individual competency is superior to 3 levels
7	-3	2	Individual competency deficiencies -3 level levels
8	4	1.5	Individual competency over 4 levels
9	-4	1	Individual competency deficiencies -4 level levels

d) Calculation and Grouping of Core factors (CF) and Secondary factors (SF) This is the stage of grouping each aspect of the criteria into 2 groups, namely the Core Factor (main factors) and Secondary Factor (supporting factors) groups. The Core Factor calculation uses the formula in the equation below:

$$NCF = \frac{\Sigma NC}{\Sigma IC}$$

Description: NC : Total value Core Factor
IC : Number of items Core Factor
NCF : Average value Core Factor

Secondary Factor calculations use the equation formula below:

$$NSF = \frac{\Sigma NS}{\Sigma IS}$$

Description: NS : Total value *Secondary Factors*
IS : Number of items *Secondary Factors*
NSF : Average value *Secondary Factors*

e) Determine the Percentage of Core Factor (CF) and Secondary Factor (SF). The percentage used to calculate the CF value is greater than the percentage used to calculate SF. because the Core Factor (CF) is the most important factor compared to the Secondary Factor (SF). The percentage used is CF is 70% and for SF it is 30%.

f) Calculating Total Value
This is the stage of calculating the total score for each aspect of the assessment, calculating the total score based on the percentage obtained from the Core Factor (CF) and Secondary Factor (SF).

$$N = (x)\% \ NCF + (x)\% \ NSF$$

Description: NCF : Average value *Core Factor* (CF)
NSF : Average value *Secondary Factors* (SF)
N : Total Assessment Value
(x) % : Entered percent value

g) Determining Ranking
The final result of the calculation using the Profile Matching method is the ranking of the total value calculation. The ranking calculation uses the following formula:

$$\textbf{Ranking (N)} = (x) \ \% \ \textbf{NO} + (x) \ \% \ \textbf{NS}$$

Description: NO : Total value of objective aspects
NS : Total value of subjective aspects
N : Total value of criteria and aspects
(x) % : Entered percent value

3. Results and Discussion
This is a discussion of the results of the research conducted.
a. Determining Aspects and Assessment Criteria
In the calculations, researchers used two aspects, namely subjective and objective aspects.
1. Subjective Aspect
Is an assessment of aspects based on the tastes of assumptions and conjectures from users and testers that are empirical (experience). The subjective aspect has 2 criteria, namely expert judgment and reputation, which can be seen in table 2 below:

Table 2. Subjective Aspect Table

No	Aspect Table	Criteria
1	Subjectivity	*Expert Judgment*
2		Reputation

2. Objective Aspect
Is an assessment of aspects based on universal (general) validity, using benchmarks and so on. The objective aspect has 4 criteria, namely material, experience certificate, legal entity specialist and negotiation price, which can be seen in table 3 below:

Table 3. Subjective Aspect

No	Aspect Table	Criteria
1		Material
2	Objectivity	Experience Certificate
3		Legal Entity Specialist
4		*Negotiation Price*

b. GAP (Gains Across Product) Mapping
Before we carry out GAP (Gains Across Product) mapping, we first provide an assessment of each Provider, which can be seen in table 4.

Table 4. Provider Assessment Data Table

No	Provider Name	Subjective		Objective			
		Expert Judgment	Reputation On	Material	Experience Certificate	Legal Entity Specialist	*Negotiation Price*
1	A	4	4	4	4	4	3
2	B	4	4	4	3	4	3
3	C	3	4	3	4	4	3

After assessing each prospective training provider, then proceed with calculating the GAP (Gains Across Product) value using the following formula:

$$\text{GAP} = \text{Value of the candidate provider's profile} - \text{Ideal Provile Value}$$

Table 5. Provider Assessment Data Table

No	Provider Name	Ideal Value	4	4	4	4	4	3
1	A		0	0	0	0	0	0

No	Provider Name	Ideal Value	4	4	4	4	4	3
2	B		0	0	0	-1	0	0
3	C		-1	0	-1	0	0	0

c. Performing Matching With Gap Weight Tables

Table 6. Table of Value Weighting Results

No	Provider Name	Subjective			Objective		
		Expert Judgment (X1)	Reputation (X2)	Material (X3)	Experience Certificate (X4)	Legal Entity Specialist (X5)	Negotiation Price (X6)
1	A	5	5	5	5	5	5
2	B	5	5	5	4	5	5
3	C	4	5	4	5	5	5

d. Calculating and Grouping Core Factor (CF) and Secondary Factor (SF)
After getting the results of the GAP (Gains Across Product) weight values for each aspect of the criteria, then group each aspect of the criteria into 2 groups, namely the Core Factor (main factor) and Secondary Factor (supporting factors) groups.
The Core Factor calculation can be seen in the equation below:

$$NCF = \frac{\Sigma NC}{\Sigma IC}$$

Secondary factor calculations use the equation formula below:

$$NCF = \frac{\Sigma NC}{\Sigma IC}$$

Core Factor calculation subjective aspect
    Core factor Provider A = X1 / 1
                = 5/1 = 5
    Core factor Provider B = X1 / 1
                = 5/1 = 5
    Core factor Provider C = X1 / 1
                = 4/1 = 4

Calculation of Secondary Factor subjective aspects
    Secondary factor Provider A = X1 / 1
                = 5/1 = 5
    Secondary factor Provider B = X1 / 1
                = 5/1 = 5
    Secondary factor Provider C = X1 / 1
                = 5/1 = 5

Table 7. Results of CF and SF Values for Subjective Aspects

No	Provider Name	Subjective X1	Subjective X2	Core Factor	Secondary Factors
1	A	5	5	5	5
2	B	5	5	5	5
3	C	4	5	4	5

Core Factor calculation for objective aspects

Core factor Provider A   = (X3+x4) / 2
                                        = (5+5)/2 = 5
Core factor Provider B   = (X3+x4) / 2
                                        = (5+5)/2 = 5
Core factor Provider C   = (X3+x4) / 2
                                        = (5+5)/2 = 5

Calculation of Secondary Factor objective aspects

Secondary factor Provider A   = (X3+x4) / 2
                                                = (5+5)/2 = 5
Secondary factor Provider B   = (X3+x4) / 2
                                                = (5+5)/2 = 5
Secondary factor Provider C   = (X3+x4) / 2
                                                = (5+5)/2 = 5

Table 8. Results of CF and SF Values for Objective Aspects

No	Provider Name	Subjective				Core Factor	Secondary Factors
		X3	X4	X5	X6		
1	A	5	5	5	5	5	5
2	B	5	5	5	5	5	5
3	C	4	5	5	5	4.5	5

Calculation of Total Value

$$N = (x)\%NCF + (x)\%NSF$$

Table 9. Core factor and secondary factor weights

No	Criteria	Weight
1	Core Factor	70 %
2	Secondary Factors	30 %

NTS (Subjective total value) Provider A
        = (5*0.7) + (5*0.3)
        = 3.5 + 1.5 = 5
NTS (Subjective total value) Provider B
        = (5*0.7) + (5*0.3)
        = 3.5 + 1.5 = 5
NTS (Subjective total value) Provider C
        = (4*0.7) + (5*0.3)
        = 2.8 + 1.5 = 4.3

Table 10. Results of CF and SF Values for Subjective Aspects

No	Provider Name	Subjective		Total
		Core Factor	Secondary Factors	
1	A	3.5	1.5	5
2	B	3.5	1.5	5
3	C	2.8	1.5	4.3

NTS (Objective total value) Provider A
        = (4.5*0.7) + (5*0.3)

$= 3.5 + 1.5 = 5$

NTS (Objective total value) Provider B

$= (4.5*0.7) + (5*0.3)$

$= 3.15 + 1.5 = 4.65$

NTS (Objective total value) Provider C

$= (4*0.7) + (5*0.3)$

$= 3.15 + 1.5 = 4.65$

Table 11. Results of CF and SF Values for Objective Aspects

No	Provider Name	Objective		Total
		Core Factor	Secondary Factors	
1	A	3.5	1.5	5
2	B	3.15	1.5	4.65
3	C	3.15	1.5	4.65

e. Determining Ranking

The final result of the calculation using Profile Matching is the ranking of the total value calculation carried out previously. The ranking calculation uses the following formula:

Ranking (N) = (x)% NO + (x) % NS

Provider Ranking A $= (0.2 *5) + (0.8 *5)$

$= 1 + 4 = 5.00$

Provider Ranking B $= (0.2 *5) + (0.8 *4.65)$

$= 1 + 3.72 = 4.72$

Provider Ranking C $= (0.2 *4.3) + (0.8 *4.65)$

$= 0.86 + 3.72 = 4.58$

Table 12. Provider Ranking Table

No	Provider Name	Subjective 20 %	Objective 80%	Total	Ranking
1	A	1	4	5.00	1
2	B	1	3.72	4.72	2
3	C	0,86	3,72	4,72	2

The table above is the final result of calculating the selection of training providers using the Profile Matching method. In this final result, the ranking of the registered Providers can be determined, the highest total score being the first place and also being the candidate selected to become a training provider at PCU (Pertamina Corporate University).

f. **Validation Test**

In this research, researchers used two methods in the validation test, namely the Confusion Matrix method to measure calculation accuracy using the Profile Matching method and the Black Box testing method to test the system that has been created.

1. Confusion Matrix

Is a method used to measure calculation accuracy using the Profile Matching method. Confusion matrix is a table that states the classification of the number of correct test data and the number of incorrect test data [14].

Table 13. Confucin Matrix calculation table

Calculation Clarification	Clarified as	
	Correct	Wrong
Correct Calculation	TP = 3	FP = 0
Wrong Calculation	FN = 0	TN = 3

True Possive (TP), namely the correct calculation ranking sequence and clarified as the correct ranking.

True Negative (TN), namely the calculation ranking sequence that is incorrect and is clarified as an incorrect ranking.

False Positives (FP), namely the sequence of calculation rankings that are correct and are clarified as incorrect rankings.

False Negatives (FN), namely the order of ranking calculations that are incorrect and are clarified as the correct ranking.

$$Akurasi = \frac{TP + TN}{TP + TN + FP + FN} \, 100\%$$

$$= \frac{3 + 3}{3 + 3 + 0 + 0} \, 100\%$$

$$= \frac{6}{6} \, 100\%$$

$$= 100\%$$

2. Black BoxTesting

Is a method used to test application systems that have been created, testing carried out on software, namely testing the functionality of the application as opposed to the internal structure or work [15].

Table 14. Black Box Testing table

No	Tested interface	Testing method	Expected results	Results
1	Main page display	Select Home	Successfully entered the application (main page)	Valid
2	TEP login menu button	Select the login button and enter your username and password	Successfully logged in and entered the system	Valid
3	Registration page menu for registration by Provider	Enter registration data	Successfully registered and can be used to log In	Valid
4	Provider home page display	Displays after the Provider has successfully logged in	Successfully displays the Provider home page	Valid

No	Tested interface	Testing method	Expected results	Results
5	Display of the TEP home page	Displays after TEP successfully logs in	Successfully displays the TEP home page	Valid
6	Homepage content menu display	Select the home content button	Successfully entered the home content page	Valid
7	Provider profile view menu display	Select the Provider profile button	Successfully entered the Provider profile page	Valid
8	The Manage Provider assessment menu displays	Select the test result data button	Successfully entered data from the assessment results of the Provider	Valid
9	The Manage assessment results menu display	Select the settings menu	Successfully entered and performed calculations using the Profile Matching method	Valid

g. Research Design

The research design was carried out using UML (Unified Modeling Language). UML is a modeling language for object-oriented systems or software [16]. Use case diagrams are a type of UML that is used to describe the relationships that occur between actors and activities in the system [17]. The following is a picture of the use case diagram of the Training Provider Selection System.
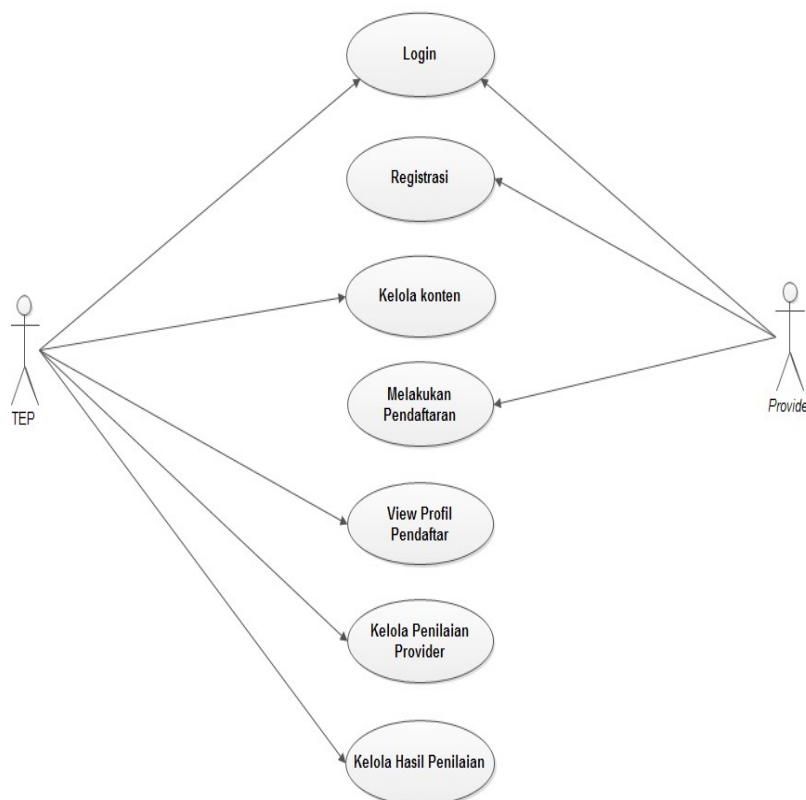
Figure 1. Use Case Diagram

h. System planning

The following displays the training provider selection application system that has been created.

1. Main page display

Figure 2. Main page display

Figure 2 above is the initial display of the training provider selection system, the system initial display page consists of a home form, login form, slide show display, news panel display.
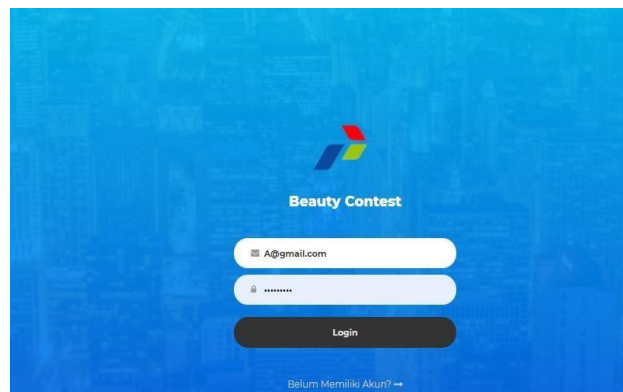
2. Login Page Display

Figure 3. Login page display

Figure 3 above shows the login page to access the system. where users are required to enter email and password.

3. Page View Provider Profile view
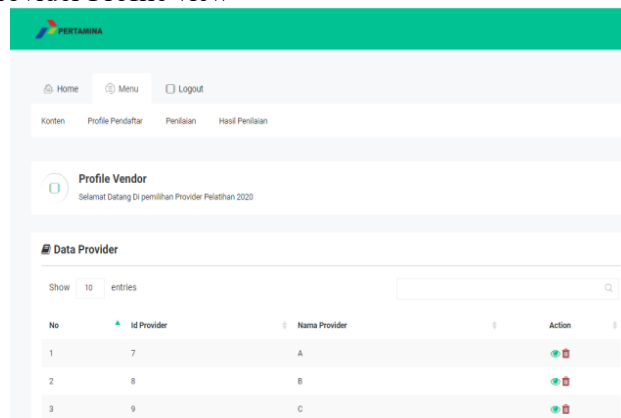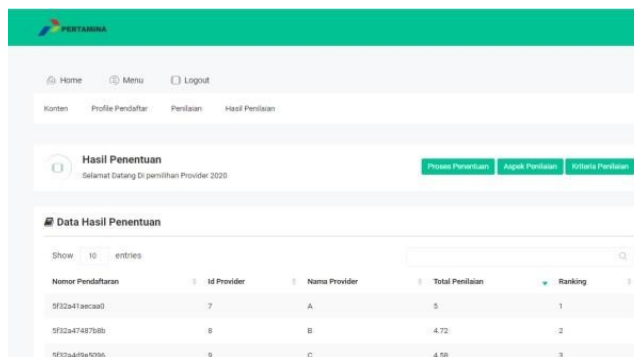
Figure 4. Provider profile view page display

The image above is a display of selecting the registrant profile menu. On the profile preview page, TEP can see and assess the data entered by the registered Provider, when submitting a registration application, by clicking the eye symbol below the action.
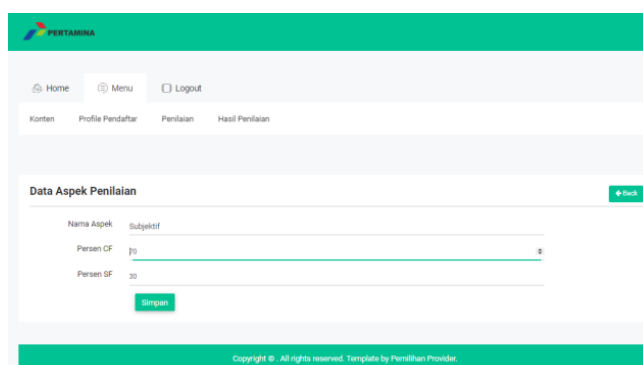
4. Appraisal Results Page Display

Figure 5. Appraisal results page display

The image above is a display of the assessment results data page, consisting of a table containing calculated rankings using the Profile Matching method

5. Appraisal Aspect Input Page Display
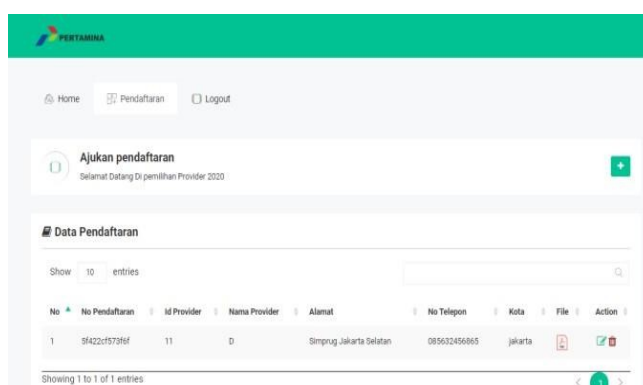

Figure 6. Appearance of the assessment aspect input page

The image above is a display of the aspect data assessment form page for assessing training provider selection, where the aspect data assessment form consists of aspect names, CF and SF percentages.

6. Provider display submitting registration

Figure 7. Provider page display for registration

The image above is the page display when an applicant submits a registration application. Which consists of applicant data that has been entered and there is a menu for submitting registration.

i. The Comparison of the Proposed System and the Previous System

Table 15. Table of Comparison Between the Proposed System and the Previous System [18].

No	Previous System	Proposed System
1	The provider selection is still conventional.	Systematic Provider Selection, namely using a website.
2	The total time for selecting a training provider is 4 weeks	The total time for selecting a training provider is 1 week.
3	The announcement of the acceptance of providers is carried out by the TEP function by contacting each provider one by one, thus requiring a long time.	The notification of provider acceptance is done by the TEP function by adding content about the provider acceptance announcement to the system.
4	The collection of proposal documents submitted by prospective providers in hardcopy format may be prone to loss.	The request proposal is submitted in softcopy through the system and is stored in the training provider acceptance system.
5	The provider selection calculation has not implemented a method yet	The provider selection calculation has implemented a method, namely the profile matching method.

4. Conclusion

In this conducted research, a Decision Support System application for selecting training providers has been developed. The application is built as a website using the PHP programming language and the Laravel framework. The chosen method is Profile Matching, which produces a final result in the form of ranking to determine the best training provider candidate at PCU quickly and accurately based on specified aspects, criteria, and weights. Additionally, the black box testing method is employed to assess the functionality of the developed system, and the Confusion Matrix method is used to measure the accuracy of calculations, resulting in a 100% accuracy rate.

References

[1] Gustiana, R., Hidayat, T., & Fauzi, A. (2022). Pelatihan Dan Pengembangan Sumber Daya Manusia (Suatu Kajian Literatur Review Ilmu Manajemen Sumber Daya Manusia). Jurnal Ekonomi Manajemen Sistem Informasi, 3(6), 657-666. https://doi.org/10.38035/jemsi.v3i6.1107

[2] Apriyaningsih, A. (2022). Sistem Pendukung Keputusan Pemilihan Vendor Project Menerapkan Metode Analytical Hierarchy Process (AHP). TIN: Terapan Informatika Nusantara, 2(9), 542-550. DOI: https://doi.org/10.47065/tin.v2i9.1309

[3] Sudipa, I. G. I., Kharisma, L. P. I., Waas, D. V., Sari, F., Sutoyo, M. N., Rusliyadi, M., & Winarno, E. (2023). Penerapan Decision Support System (Dss) Dalam Berbagai Bidang (Revolusi Industri 4.0 Menuju Era Society 5.0). PT. Sonpedia Publishing Indonesia.

[4] Asnal, H., Fitri, T. A., & Anam, M. K. (2020). Sistem Pendukung Keputusan Penunjukan Supplier Pengadaan Perangkat Kesehatan Pada Instalasi Farmasi RSUD Arifin Achmad Pekanbaru Dengan Metode Multifactor Evaluation Process. SATIN-Sains Dan Teknologi Informasi, 6(1), 98-105. DOI: https://doi.org/10.33372/stn.v6i1.618

[5] Sinaga, D. C. P., Sianipar, B., & Marpaung, P. (2020). Pemilihan Calon Manager Dari Pegawai Berprestasi Menggunakan Metode *Profile Matching* Pada CV. Glofacia Oceanic. J-

Sakti (Jurnal Sains Komputer dan Informatika), 4(2), 643-656. DOI: http://dx.doi.org/10.30645/j-sakti.v4i2.256

[6] Santika, R. R., Kamila, A., Abdillah, M. I., & Hansen, S. (2020). Penerapan Metode *Profile Matching* Dalam Sistem Penunjang Keputusan Pemilihan Karyawan Terbaik Pada Lembaga Penyiaran Publik Televisi Republik Indonesia. INOVTEK Polbeng-Seri Informatika, 5(1), 68-82. DOI: https://doi.org/10.35314/isi.v5i1.1311

[7] Kuswanto, J. (2020). Penerimaan Karyawan Baru menggunakan metode *Profile Matching*. Jurnal Processor, 15(2), 85-97. DOI: https://doi.org/10.33998/processor.2020.15.2.831

[8] Sitanggang, D. (2018). Sistem Pendukung Keputusan Pengangkatan Instruktur Tetap Pada Lembaga Kursus Dan Pelatihan Karya Prima Dengan Metode *Profile Matching*. Jurnal Sistem Informasi dan Ilmu Komputer Prima (JUSIKOM PRIMA), 1(2).

[9] Sari, H. U., Windarto, A. P., Hartama, D., & Satria, H. (2020, February). Penerapan Metode *Profile Matching* Pada Pemilihan Raket Bulu Tangkis Berdasarkan Konsumen. In Seminar Nasional Teknologi Komputer & Sains (SAINTEKS) (Vol. 1, No. 1, pp. 325-329).

[10] Nuraini, A. (2020). Penentuan Ketua Osis Menggunakan Metode *Profile Matching* Pada Smk Cengkareng 1 Jakarta Barat. Bit (Fakultas Teknologi Informasi Universitas Budi Luhur), 16(2), 23-28. DOI: http://dx.doi.org/10.36080/bit.v16i2.888

[11] Satrio, D. A., & Suryadi, L. (2020). Sistem Penunjang Keputusan Seleksi Pelamar Kerja Pada Bni Life Insurance Mengunakan Metode *Profile Matching* Berbasis Object Oriented. Idealis: InDonEsiA journal Information System, 3(1), 532-538. https://doi.org/10.36080/idealis.v3i1.2336

[12] Gulo, D. (2020). Sistem Pendukung Keputusan Pemilihan Tenaga Kerja Indonesia (TKI) Berdasarkan Kualitas Untuk Menentukan Tempat Kerja Menggunakan Metode *Profile Matching* (Studi Kasus: PT Adila Prezkifarindo Duta). Jurnal Sistem Komputer dan Informatika (JSON), 1(2), 142-150.

[13] Apriana, V. (2019). Penerapan *Profile Matching* Untuk Menentukan Pemberian Beasiswa Pada Siswa Sekolah Menengah Atas. Jurnal Mantik Penusa, 3(1, Juni).

[14] Normawati, D., & Prayogi, S. A. (2021). Implementasi Naïve Bayes Classifier Dan Confusion Matrix Pada Analisis Sentimen Berbasis Teks Pada Twitter. J-SAKTI (Jurnal Sains Komputer Dan Informatika), 5(2), 697-711. DOI: http://dx.doi.org/10.30645/j-sakti.v5i2.369

[15] Putra, A. P., Andriyanto, F., Karisman, K., & Harti, T. D. M. (2020). Pengujian Aplikasi Point of Sale Menggunakan Blackbox Testing. Jurnal Bina Komputer, 2(1), 74-78. https://doi.org/10.33557/binakomputer.v2i1.757 Suendri, S. (2019). Implementasi Diagram UML (Unified Modelling Language) Pada Perancangan Sistem Informasi Remunerasi Dosen Dengan Database Oracle (Studi Kasus: UIN Sumatera Utara Medan). Algoritma: Jurnal Ilmu Komputer Dan Informatika, 2(2), 1.

[16] Suendri, S. (2019). Implementasi Diagram UML (Unified Modelling Language) Pada Perancangan Sistem Informasi Remunerasi Dosen Dengan Database Oracle (Studi Kasus: UIN Sumatera Utara Medan). Algoritma: Jurnal Ilmu Komputer Dan Informatika, 2(2), 1.

[17] Kartika, M. D., & Priyadi, Y. (2020). Pengembangan Sistem Penjualan Menggunakan UML dan Proses Bisnis E-Commerce Pada TB. Purnama Banjarnegara. JATISI (Jurnal Teknik Informatika Dan Sistem Informasi), 7(3), 480-497. DOI: https://doi.org/10.35957/jatisi.v7i3.416

[18] Dimas. (2020, Juli 12). Interview with the Assistant Manager delves into the selection of training providers in the context of comparing the research results with previous studies.