



Application of Profile Matching in Employee Recruitment (Case Study of CV. Tira Gemilang)

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ABSTRACT

Recruitment is a process of hiring employees who will be placed in one position to carry out certain activities. Generally, the recruitment or hiring of employees has techniques or methods in the appraisal process. Such as the stage of the entrance test or in-person interviews conducted by a psychologist appointed by the company. So in general, the recruitment system is applied manually but the indicators have been determined. The process that occurs takes a lot of time, sometimes in an assessment using feelings, this assessment should be carried out objectively. For this reason, a decision support system for company recruitment was built using the profile matching method. This method is suitable for carrying out the recruitment process based on near-perfect criteria.

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1. Introduction

Currently, computerized support has penetrated into all fields, including in the decision-making process. A computer-based decision support system is considered interactive so that in the process of selecting employees it involves many components or criteria that are assessed (multicriteria), a computer-based decision support system is needed, because a decision support system is a process of processing data and information carried out aimed at producing various alternative decisions that can be taken. Decision support systems do not replace the function of decision makers in making decisions, but only as a tool for decision makers in carrying out their duties (Putri, E., et al, 2016).

So far, employee recruitment has been carried out by assessing the ability of prospective employees based on the results of interviews and other assessments. The concept of manuals that are given and carried out is not transparent and it is also difficult to determine which employees are in accordance with company needs such as the lack of assessment parameters for prospective employees. For that we need a decision support system method that can accommodate the needs of the company, especially in terms of recruitment of employees.

One of the decision support system methods is the profile matching method. This method is effective in simplifying and accelerating the decision-making process by solving problems into its parts, where first the competencies (abilities) needed in hiring employees are determined. These competencies or abilities must be met by outstanding students or prospective students. Broadly speaking, it is the process of comparing individual competencies to employee recruitment competencies so that differences in competence can be found (gap), the smaller the resulting gap, the greater the weight of the value, which means a greater chance of being elected as a new employee.

2. Literature review

According to Setyaningsih (2007), profile matching is a decision-making mechanism by assuming that there is an ideal predictor variable level that must be met by the subject under study, not a minimum level that must be met or passed. There are several examples of its application, namely: employee performance evaluation for promotion, football player management, worthy scholarship recipients and so on.

According to Kusri (2007), the profile matching method is a method that is often used as a mechanism in decision making by assuming that there is an ideal predictor variable level that must be met by the subject under study, not a minimum level that must be met or passed. In the process of profile matching, in general, it is a process of comparing each criterion, the process of comparing each criterion for each assessment in



employee recruitment so that the difference in score (gap) is known, the smaller the resulting gap, the greater the weight of the value, which means that it has a greater chance of prioritizing feasibility. /graduation. The gap value can be calculated using equation (1). While the weighting of the gap value is determined based on table 1.

$$Gap = \text{profile proposal} - \text{profil ideal} \dots\dots\dots (1)$$

The next step is to calculate the core factor and secondary factor values. Core factor is the most important assessment criteria that must be contained in an object. The core factor calculation uses equation (2).

Table 1.
Weighting Gap Value

No.	Difference	Weight	Information
1	0	5	There is no difference in the criteria score
2	1	4.5	1 level excess criteria
3	-1	4	1 level deficiency criteria
4	2	3.5	2 level excess criteria
5	-2	3	2 level deficiency criteria
6	3	2.5	3 level excess criteria
7	-3	2	3 level deficiency criteria

Source: Faizal, E., 2014

$$NCF = \frac{\sum NC(kriteria)}{\sum IC} \dots\dots\dots (2)$$

Information:

- NCT : Average value *core factor*
- NC : The total number of scores *core factor*
- IC : Amount *core factor items*

Meanwhile, secondary factor is items other than those in the main factor (core factor). Secondary factor is calculated using equation (3).

$$NSF = \frac{\sum NS(kriteria)}{\sum IS} \dots\dots\dots (3)$$

Information:

- NST : Average value *secondary factor*
- NS : The total number of scores *secondary factor*
- IS : Amount *secondary factor item*

Furthermore, the calculation of the total value is based on the value of the core and secondary factors which are used as assessment criteria that affect the hired employees. Calculations can be done using equation (4).

$$N(Tot_kriteria) = (x)\% NCF + (x)\% NSF \dots\dots\dots (4)$$

Information:

- NCT : Average value *core factor*
- NST : Average value *secondary factor*
- NT : The total value of the assessment criteria

The final step is the ranking calculation which is done using equation (5).

$$Ranking = (x)\% N1 + (x)\% N2 + (x)\% Nn \dots\dots\dots (5)$$

Information:

- N1, N2, Nn: Total scores per criterion
- (x)% : Percentage of criterion values

Broadly speaking, this method has several stages and calculation formulations, namely:

- a. Weighting
- b. Calculation and grouping of core factor and secondary factor
 - 1) *Core Factor* (Main factor)
 - 2) *Secondary Factor* (Supporting factors)
- c. Calculation of the Total Value of Each Aspect
- d. Ranking Calculation



2.1 Analysis

The ongoing system analysis is the study and evaluation of the current system or the old system to make it easier to identify and evaluate problems, opportunities, and obstacles, which occur especially in this case the existing decision-making system with the aim of obtaining new design.

Before carrying out a new design, the current system is first reviewed. The system that is currently running is important to analyze because it is the basis for planning a new one where the old system will be used as a comparison for designing the new system.

In processing the data, the employee appraisal decision-making still uses a subjective concept, where the assessment is carried out using feelings or intuition and interests. This resulted in the lack of transparency in the data process, unclear assessment structures, and difficulty in applying the scoring system objectively. So we need an analysis of the existing system.

The objectives of this system analysis are as follows:

- a. To learn about the current system.
- b. To make it easier to design a new system or determine the system design to be built.
- c. Analyze the input requirements of the system to be built.
- d. Analyze the output and determine its use in the system.
- e. Evaluation of the effectiveness and efficiency of an ongoing system with the system to be built as a comparison between the two.
- f. To create a system structure that can provide kemudahan-ease of processing data.

In terms of the use of information technology, the Company has used computers to support its work and work processes. However, the use of computers is still limited, one of which is regarding employee data collection and documentation of other activities. But in the appraisal process for employee recruitment, it still uses a manual concept, namely viewing, recording and scoring.

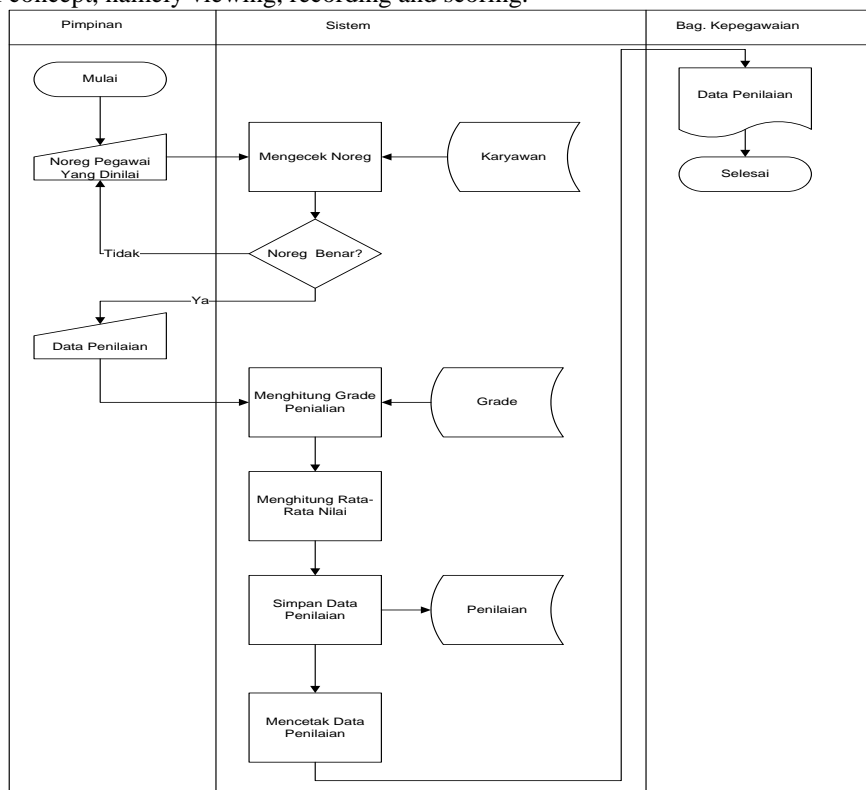


Fig 1. Current System Flow of Document

2.2 Evaluation of the Current System

Based on the analysis of the systems contained in the system that is currently running above, the writer wants to build a system where this system is expected to help facilitate the decision making process for assessing employee acceptance at the agency. Based on the problems that exist in the current system, a solution is needed, including the following:

- a. Designed a computerized decision-making process for evaluating employee candidates as needed.

- b. Built a database system that can store data related to the processing of employee assessment decisions so that data processing and data retrieval does not require a long time.

From the explanation of the ongoing system, the writer wants to develop an existing system using a programming language, especially the assessment of employee recruitment. Here the author uses the Microsoft Visual Studio 2010 programming language. The proposed system is expected to be able to solve the problems faced by the company. By using this proposed alternative system, it is hoped that the work can be easier and faster and problem solving can be resolved.

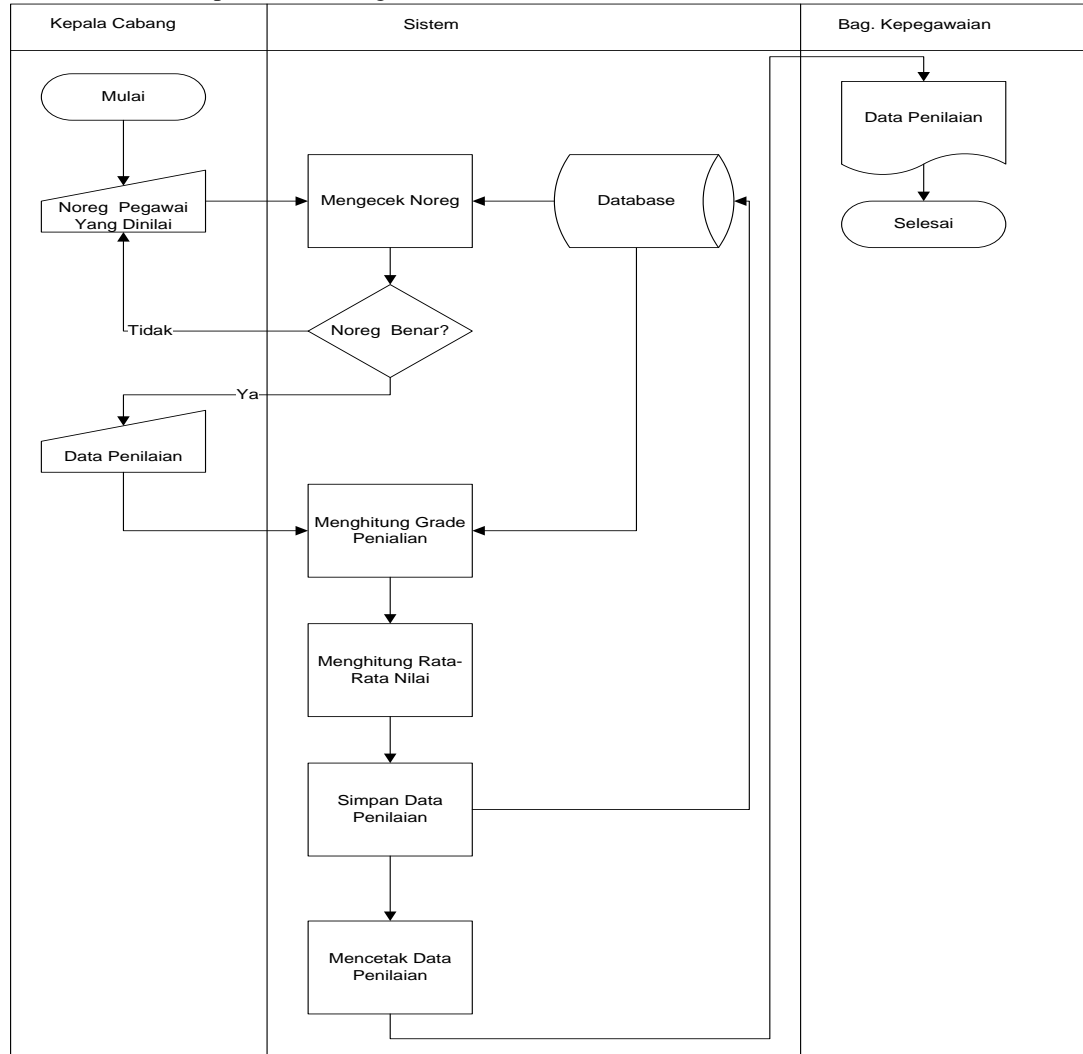


Fig 2. Flow of Document Proposed System

2.3 Program Development Procedure

Before creating a program, first determine what program will be made, for manufacturing requires a system design or Figan. Following are some of the programming procedures:

- a. Determine what program will be made.
 - b. The required data is available
 - c. *Database* what to use
- To create a database is done with a database format using Microsoft Access 2007.
- d. Flowchart
 - e. Modify the database
 - f. Input and Output Design
 - g. Error-free program

2.4 Design Method

A good system and in accordance with the rules of information system design, in designing a decision support system for employee recruitment assessments at the company has determined several designs that include:

2.5 Criteria Used

In this study, there are 3 types of criteria that become the basis for agencies in making decisions, namely as follows:

- a. Intellectual Capacity
- b. Work attitude
- c. Behavior

The variable aspects of the assessment of intellectual capacity are divided into:

- 1) Concentration
- 2) Systematics of Thinking
- 3) Practical Logic
- 4) Potential Intelligence

Work attitude variables are divided into:

- 1) Psychic Energy
- 2) Accuracy
- 3) Be careful
- 4) Achievement Drive

Meanwhile, the behavioral variables are divided into:

- 1) Power
- 2) Influence
- 3) Determination
- 4) Fulfillment

2.6 Profile Matching Method Calculation Process

a. Criteria

Criteria are used as reference parameters in decision making to determine a basis for conclusions for a problem raised as shown in the following table:

Table 2
Gap Value Weight

Difference	Weighted Value	Information
0	5	There is no difference (competency as required)
1	4.5	Individual competence is 1 level excess
-1	4	Individual competence is 1 level deficient
2	3.5	Two levels of excess individual competence
-2	3	Individual competence lacks 2 levels
3	2.5	3 levels of excess individual competence
-3	2	Individual competence lacks 3 levels
4	1.5	4 levels of excess individual competence
-4	1	Individual competence lacks 4 levels

To assess the feasibility of alternatives against various criteria, decision makers can use a set of linguistic rankings based on table 3.1. Employees as an alternative in this system are ranked on each of the criteria using these linguistic values.

Table 3.
Predefined criteria and scale values

Criteria	Ordinal Scale	Weight
Intellectual Capacity	Very less	1
	Less	2
	Enough	3
	Good	4
	Very good	5
Work attitude	Very less	1
	Less	2
	Enough	3
	Good	4
	Very good	5



Criteria	Ordinal Scale	Weight
Behavior	Very less	1
	Less	2
	Enough	3
	Good	4
	Very good	5

b. Target Value

The target value for each criterion determines the employee's graduation predicate by directly assigning a value to each predetermined criterion based on its importance. After the weight value is given for each criterion, then all the weights are added and divided by the respective weight values for each criterion. The weights of the criteria can be seen as shown in the following table:

Table 4
Target Value Against Variables Used

Variable	Sub Variable (Alternative)	Target Value
Intellectual Capacity	Concentration	3
	Systematics of Thinking	4
	Practical Logic	4
	Potential Intelligence	4
	Psychic Energy	3
Work attitude	Accuracy	4
	Be careful	2
	Encouragement for Achievement	3
Behavior	Power	3
	Influence	3
	Determination	4
	Fulfillment	5

c. Profile Matching Algorithm

At the beginning of the calculation of the profile matching algorithm, prospective employee data in the form of values are converted first with the alternative match values that have been determined and then normalized, as in the following table:

Table 5.
Value Obtained by Employees

Noreg	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12
CP001	2	4	3	3	3	4	3	1	4	4	4	4
CP002	3	4	3	3	4	5	5	1	4	3	4	4
CP003	4	4	3	3	4	2	2	4	4	5	5	2
CP004	3	5	4	3	4	5	4	3	4	3	3	5

After the alternative weights have been adjusted to the suitability value, the next step is mapping the competency gap, where the gap is the difference / difference in the value of each aspect / attribute with the target value.

$$\text{Gap} = \text{Value Attribute} - \text{Value Target}$$

So that the following results are obtained:

Table 6.
Gap Value Obtained by Employees

Noreg	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	
CP001	2	4	3	3	3	4	3	1	4	4	4	4	
CP002	3	4	3	3	4	5	5	1	4	3	4	4	
CP003	4	4	3	3	4	2	2	4	4	5	5	2	
CP004	3	5	4	3	4	5	4	3	4	3	3	5	
Requirements Profile	3	3	4	4	3	4	2	3	3	3	4	5	
CP001	-1	1	-1	-1	0	0	1	-2	1	1	0	-1	GAP
CP002	0	1	-1	-1	1	1	3	-2	1	0	0	-1	
CP003	1	1	-1	-1	-2	1	3	2	1	2	1	-3	



Noreg	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12
CP001	2	4	3	3	3	4	3	1	4	4	4	4
CP002	3	4	3	3	4	5	5	1	4	3	4	4
CP003	4	4	3	3	4	2	2	4	4	5	5	2
CP004	3	5	4	3	4	5	4	3	4	3	3	5
CP004	0	2	0	-1	1	1	2	0	0	0	0	0

After the gap value is obtained, the next step is to map the weight value for the gap based on the table so that an example is taken from CP001 with the following results

Table 7.

Results of Competency Gap Mapping and Gap Value Weight Results

Noreg	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10	K11	K12	Information
CP001	-1	1	-1	-1	0	0	1	-2	1	1	0	-1	Gap Value
CP002	4	4.5	4	4	5	5	4.5	3	4.5	4.5	5	4	Weighted Value Results

After determining the weight of the gap value for the three aspects, namely aspects of intellectual capacity, work attitude and behavior in the same way, each aspect is grouped into 2 groups, namely the core factor and secondary factor. For the core factor using the formula:

$$NCF = \frac{\sum NC(i, s, p)}{\sum IC}$$

Information:

- NCF : Core factor average value
- NC (i, s, p) : The total number of scores *core factor*
- IC : Number of items *core factor*

As for the secondary factors, namely:

$$NSF = \frac{\sum NS(i, s, p)}{\sum IS}$$

Information:

- NCF : Average value of secondary factor
- NC (i, s, p) : The total number of scores *secondary factor*
- IC : Number of items *secondary factor*

The calculation of the core factor and secondary factor for the intellectual capacity aspect is carried out by first determining which sub-aspects are the core factors, such as sub-aspects 1 and 2 and the remaining sub-aspects as secondary factors.

$$NCF = \frac{4+4,5}{2} = 4,25 \quad NCF = \frac{5+5}{2} = 5 \quad NCF = \frac{4,5+4,5}{2} = 4,5$$

$$NSF = \frac{4+4}{2} = 4 \quad NSF = \frac{4,5+3}{2} = 3,75 \quad NSF = \frac{5+4}{2} = 4,5$$

From the calculation of each aspect above, then the total value is calculated based on the percentage of the core factor and the secondary factor which are estimated to affect the recruitment of each employee.

$$N(i, s, p) = (x)\% \cdot NCF(i, s, p) + (x)\% \cdot NSF(i, s, p)$$

Information:

- NCF (i, s, p) : Average value *core factor* (Int. capacity, work attitude, behavior)
- NSF (i, s, p) : Average value *secodary factor* (capacity, work attitude, behavior)
- N (i, s, p) : The total score of all aspects
- (x)% : The percent value entered

The calculation of aspects of intellectual capacity, work attitude and behavior with a value of 60% and 40% and 50% and 50% are as follows:

For CP001: core factor = 4.25 and secondary factor = 4, it is obtained

$$Ni = (60\% \times 4.25) + (40\% \times 4) = 4.15$$

$$Ni = (50\% \times 5) + (50\% \times 3.75) = 4.375$$

$$Ni = (50\% \times 4.5) + (50\% \times 4.5) = 4.5$$



The final result of the profile matching process is the ranking of candidates submitted to fill a certain position. Ranking refers to the results of certain calculations.

$$\text{Rank} = (x)\% \cdot N_i + (x)\% \cdot N_s + (x)\% \cdot N_p$$

Information:

N_i : Value Intellectual Capacity

N_s : Value of Work Attitude

N_p : Behavior Value

(x)%: The percent value entered

As an example of the formula for calculating the ranking above, consider the final results of CP001 employees with a percent value of 20%, 30% and 50% as follows:

$$\begin{aligned} \text{Ranking} &= (20\% \times 4.15) + (30\% \times 4.375) + (50\% \times 4.5) \\ &= 0.83 + 1.3125 + 2.25 \\ &= 4.3925 \end{aligned}$$

After each candidate gets the final result like the example in the table above, the ranking or ranking of the candidate can be determined based on the greater the value of the final result so that the greater the opportunity to become a permanent employee in the company and vice versa.

3. Research Results and Discussion

The following is a display of the employee recruitment assessment data form at the company using the proposed Profile Matching method in the decision support system.

The screenshot shows a software interface for employee appraisal. It contains several data tables and summary statistics. The 'Hasil' section contains three tables with the following data:

	Konversi	Constant	Gap	Bobot
Konsentrasi	4	3	1	4.5
Sistematika Berfikir	4	3	1	4.5
Logika Praktis	4	4	0	5
Potensi Kecerdasan	4	4	0	5

	Konversi	Constant	Gap	Bobot
Energi Psikis	5	3	2	3.5
Ketelitian	3	4	1-	4
Kehati-hatian	4	2	2	3.5
Dorongan Berprest.	5	3	2	3.5

	Konversi	Constant	Gap	Bobot
Kekuasaan	4	3	1	4.5
Pengaruh	4	3	1	4.5
Keteguhan Hati	5	4	1	4.5
Pemenuhan Tugas	4	5	1-	4

Summary Statistics:

- Nilai Rata-Rata Core Factor Variabel Kapasitas: 4.5
- Nilai Rata-Rata Secondary Factor Variabel Kapasitas: 5
- Nilai Rata-Rata Core Factor Variabel Sikap Kerja: 4.5
- Nilai Rata-Rata Secondary Factor Variabel Sikap Kerja: 4.25
- Nilai Rata-Rata Core Factor Variabel Prilaku: 3.75
- Nilai Rata-Rata Secondary Factor Variabel Prilaku: 3.5

Employee Details Table:

Kode_Penilaian	kode_karyawa	nama_karyawa	kon	sis	log	pot	ene
KP001	CP001	Adi Wiguna ...	Baik	Baik	Baik	Baik	Sangat B

Fig 3. Appraisal Data Form Display

Based on the data above, it can be seen that the process is carried out in stages with calculations in accordance with the theory carried. Where the core factor and secondary factor values have been determined. Then assign scores to the criteria so that they are categorized. The process is carried out so that the total value of each criterion is obtained, then combined with the core and secondary factor values, in order to obtain a value for each prospective employee.

4. Conclusion

- The Profile Matching method provides an assessment based on an approach that is tailored to the needs of the company by approaching predetermined criteria
- With the implementation of the new system, it is hoped that all obstacles regarding subjective assessment can be removed, because with the use of this system, the assessment becomes objective even though it depends on the user of the system.

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