Decision Support System for Promotion Selection using the Multi Factor Evaluation Process Method

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Abstract

Company PT. ALS is a ground transportation service company that transports passengers between cities and provinces. Buses from PT. ALS has been a mainstay and pride of the community, especially in its timely service in taking passengers to their destination. Promotion at PT. Currently, the ALS assessment process for selecting employee promotions is carried out by supervisors in each division who directly evaluate employee performance. Then in the process of selecting the position of the candidate who has the highest score based on certain criteria who will occupy the required position in accordance with the required criteria. Data calculations are done manually using Microsoft Excel but have not used the computer system optimally. The basis for this research is to help PT. ALS in making a decision in selecting employee promotions. Position is a group of positions that are almost the same in an agency, institution or company. For employees, the results of the assessment can be used as feedback on work performance, so that they have a basis for consideration for planning their career development. This research will be conducted using the Multi Factor Evaluation Process method by processing several criteria for decision making. Meanwhile, on the other hand, the results of this assessment can be used by the company to base decision-making in terms of reward system (compensation), promotion, training and career planning.

Keywords : Multi Factor Evaluation Process, Selection, Performance, Decision Making, Compensation.

1. Introduction

Human Resources who are qualified and have high motivation at work will be able to maintain quality and achieve the goals of the company. For this reason, it is necessary to do the right selection of employees, both selection of new employees and employees who are doing promotions. In the selection process, sometimes it becomes a common problem where the assessment process can be carried out subjectively for one of the employees. So the results achieved will not be as expected.

PT ALS is a ground transportation service company that transports passengers between cities and provinces. Buses from PT ALS have been the mainstay and pride of the community, especially in their timely service in taking passengers to their destination. In these companies, in the selection of career paths or promotions, supervisors in each section directly assess the performance of employees who will get a promotion, so that sometimes the promotions given are not right on target for employees who have good performance, because the assessment is only seen from the length of work, discipline and employee performance.

Many methods can be used in making decision support systems. One method that can be used in making decision support systems is the Multi Factor Evaluation Process (MFEP) method.

Basically the Decision Support System is a further development of a computerized Management Information System that is designed in such a way that it is interactive with the user. which is better [1].

Support Systems (DSS) are interactive information systems that provide information, modeling, and data manipulation that are used to assist decision making in semi-structured and unstructured situations [2].

Decision Support Systems are interactive information systems to assist decision making in semi-structured and unstructured situations like this. With the existence of a decision support system, it can help the head of the service as a decision maker to choose food crops that are suitable for planting by farmers in Musi Rawas Regency [3].

Decision Support Systems can be explained as the process of selecting the best alternative from several alternatives in a systematic way to be used as a way of solving problems by utilizing certain technologies or systems. Decision support systems are described as interactive information systems that provide information, modeling, and data manipulation that assist in decision making [4].

There are various decision support systems currently being developed, one of which is the Multi Factor Evaluation Process method. Decision making using the Multi Factor Evaluation Process method is carried out

subjectively and intuitively by considering several factors that influence the alternative [5]

SPK is an interactive information system that provides information, modeling, and data manipulation that is used to assist decision making in semi-structured and unstructured situations [6]. Previous research on SPK has been carried out using the Multicriteria Decision Support System (MDSS) method for evaluating carpooling so that it is able to produce schedules for drivers and provide maximum satisfaction in terms of profitability, punctuality and travel comfort [7]. Subsequent studies on SPK used the Multi Factor Evaluation Indicator method for evaluating trans-critical organic rankine cycles with low GWP fluids [8].

Subsequent research on DSS uses the Multi Factor Evaluation Indicator method which is capable of producing decisions in the form of risk assessments of the atmospheric and marine hazard groups caused by typhoons in typhoon-prone southeastern Chinese coastal cities [9]. Other research on SPK uses the Multi Factor Evaluation Process (MFEP) method which is used in selecting new employees [10].

The MFEP method is a quantitative method that uses a weighting system in decision making. In this MFEP method, the decision maker will weigh factors that have an important influence on alternative choices subjectively and intuitively. In the MFEP method, all criteria which are important factors in making the consideration are given appropriate weighting, likewise each alternative will be given a value for the important existing factors, which will then be evaluated for each alternative related to these consideration factors. The alternative that gets the highest evaluation value is the best solution based on the important factors that have been selected [11].

The decision support system with the MFEP method which discusses healthy food choices is still not widely used at this time. However, in another study using the MFEP method, Anam Masfiil and Gaguk Susanto had previously conducted research with results that assisted in the selection process for providing rice assistance to the poor in Kalibendo Village [12].

The process of selecting the best alternative uses a weighting system, where the method is a quantitative method, referred to as the Multifactor Evaluation Process (MFEP) method. The multifactor evaluation process is widely used on the grounds that the concept is simple and easy to understand, then the computation is efficient, after that it has the ability to measure relative performance and decision alternatives in a simple mathematical form [13].

The following are the steps for the MFEP process: The steps for the calculation process use the MFEP method [14], namely:

1. Determine the factors and factor weights where the total weighting must be equal to 1 (∑weighting = 1) or called factor weight.
2. Fill in the value of each factor needed in the decision-making process, the value entered is an objective value, namely the evaluation factor whose value is 0 – 1.
3. The process of calculating the weight evaluation is a calculation between the weight factor and the evaluation factor by adding up, the results of the weight evaluation can determine the evaluation results.

2. Research methodology

The research framework is a concept or stages that will be carried out in research. So that the steps taken by the author in this design do not deviate from the subject matter of the discussion, the sequence of research steps will be made systematically so that they can be used as clear guidelines. The sequence of steps to be made in research is shown in Figure 1.
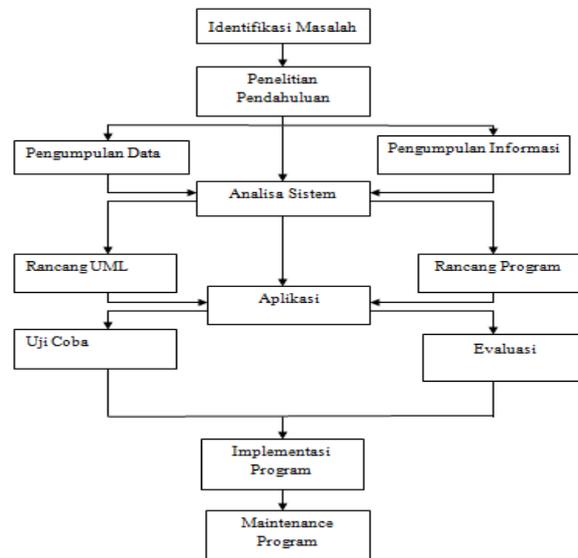

Figure 1. Research Framework

The research stage is a sequence of processes or steps that will be carried out in completing this research. The stages of this research are as follows:

2.1 Identification of problems
Identification of the problem is a step taken by the researcher at the beginning of the research. Researchers identify problems by explaining what problems are found in data processing, how these problems are measured and related to research procedures. This stage is also the initial stage in conducting research.

2.2 Preliminary Research
In this stage the authors obtain data from various sources where this research is obtained from various articles and obtained from other references. The

purpose of studying the literature in this research is to strengthen the theory and methods used to solve existing problems and as a theoretical basis for conducting studies.

2.3 Data collection

In collecting data, the authors obtain data from various sources, such as in this study, obtained from articles, and obtained from other references. And this research was also conducted by applying the method of direct interviews with employees.

Research time
The research was conducted by processing the data that has been obtained. This research was conducted on March 18 2022 until it was completed.

Research Place
This research was conducted at PT. ALS which is a company engaged in the field of transportation services.

2.4 Analysis

System analysis is the basis for designing and planning the system to be made, system analysis is carried out to find out what is needed by the system. This system analysis is carried out to design the system to be built, the design includes designing the user interface, designing the database for the system so that file management is more organized. Where the system will be made using the PHP programming language and MySQL database.

2.5 UML design

At this stage, a system design will be carried out that will be run by UML (Unified Modeling Language) as a tool in carrying out the program model analysis flow.

2.6 Application Design

The design of this designed program can be used by PT. ALS will be managed by the admin. Where the admin can login access, and manage data and reports.

2.7 Trials

This stage is the result of a data processing system that was built, where this system will later be run and used to assist PT. ALS in selecting employee promotions.

2.8 Evaluation

The evaluation process will be carried out on the resulting system to find out whether the system that has been designed can run correctly and in accordance with the design being carried out, and to find out whether there are still bugs and crashes in the system being built, if there is a program an improvement process will be carried out.

2.9 Implementation

System implementation is the stage of putting the system in place so that it is ready to operate. Implementation aims to confirm design modules, so that users can provide input to application development. At this stage the application design is carried out using the PHP programming language and MySql database.

2.10 Maintenance

Maintenance or maintenance is a series of activities to maintain facilities and equipment so that they are always ready for use to carry out production effectively and efficiently according to a predetermined schedule and based on standards with the aim of increasing the productivity of a company or agency that uses the system.

3. Results and Discussion

3.1 Multi Factor Evaluation Process (MFEP) Method

The initial stage in the MFEP method, namely determining the factors and weights, can be seen in Table 1.

Table 1. Criteria and Factor Weights

Factor	Weight (%)	EF
Presence	20	0.2
Behavior	30	0.3
Cooperation	50	0.5
∑	100	1

The EF value is obtained from the weight value of each criterion divided by the total weight, because in the MFEP method the EF value must be equal to 1 (one). The assessment process for each supplier /alternative based on each criterion can be seen in Table 2 below.

Table 2. Factor Evaluation Value

No	Employee name	K1	K2	K3
1	Rolly Primary	2	3	2
2	Rezky Hamdani	2	3	1
3	Annisa Putri	1	3	1
4	Noval Putra	1	3	2
5	Heru Setiawan	1	3	1
6	Indri Septiani	2	3	3
7	Abdul Rahman	1	3	3
8	Megasari	2	3	3
9	Edo Perma	1	3	2
10	Ihsan Septiadi	2	3	4

Furthermore, calculations are carried out, where the calculation process uses the *Weight Evaluation method* . The next stage is the process of calculating the weight evaluation, namely the process of calculating the weight between the factor weight and

factor evaluation as well as the sum of all the results of the weight evaluation to obtain the total evaluation results. The following is the process of calculating the weigh evaluation using the following formula:

$$we = wf \; x \; ne$$

Where :

we : Evaluation weight value
wf : Factor weight value ;
n e : Factor evaluation value

After doing the calculations, the next step is to add up the total weight evaluation of each alternative, the sum of which can be seen from the results of the calculations in Table 3 .

Table 3. Calculation of Weight Evaluation

No	Employee name	Total *Weight Evaluation*
1	Rolly Primary	0.575
2	Rezky Hamdani	0.45
3	Annisa Putri	0.4
4	Noval Putra	0.525
5	Heru Setiawan	0.4
6	Indri Septiani	0.7
7	Abdul Rahman	0.65
8	Megasari	0.7
9	Edo Perma	0.525
10	Ihsan Septiadi	0.825

After calculating using the *Weight Evaluation method* , an employee is said to meet the requirements to be the best employee if the total weight evaluation value is > 0.8 and if the total weight evaluation value indicates failure < 0.8. The decision making results of 10 employees can be seen in Table 4.

Table 4. Decision

No	Employee name	Total value	Decision
1	Ihsan Septiadi	0.825	Continue to be Maintained
2	Indri Septiani	0.7	Try Harder
3	Megasari	0.7	Try Harder
4	Abdul Rahman	0.65	Try Harder
5	Rolly Primary	0.575	Try Harder
6	Noval Putra	0.525	Try Harder
7	Edo Perma	0.525	Try Harder
8	Rezky Hamdani	0.45	Try Harder
9	Annisa Putri	0.4	Try Harder
10	Heru Setiawan	0.4	Try Harder

From the results of Table 4. the results obtained , employee recommendations for promotion based on the results of calculations using the Multi Factor Evaluation Process method are Ihsan Septiadi with a final result of 0.825.

3.2 Process Testing of the Multi Factor Evaluation System Method.

1. On the weights and criteria data page, data can be added, edited and deleted, according to the calculations that we will do. Can be seen in the following image:

Figure 2 Weight and Criteria Input Form

2. On this page, assessment data information can be added, edited and deleted. Can be seen in the following image:
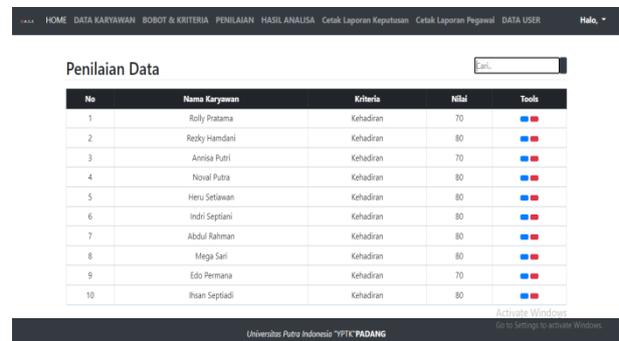

Figure 3 Assessment Input Form

3. On the analysis results page, there is information on the results of the calculations that have been carried out, which can be seen in Figure 4.
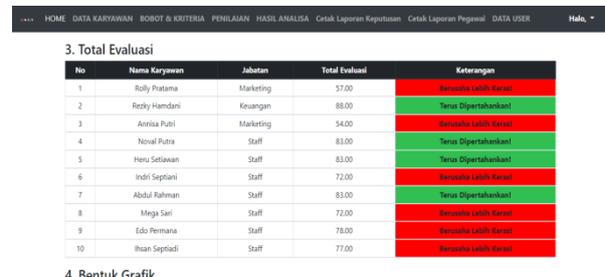

Figure 1Analysis Results Page

4. On the decision results report page, the results of the calculation above are generated, where the results of the report can be printed, can be seen in Figure 5.

Figure 5 Display of the Decision Result Report

4. Conclusion

From the discussion and results of the analysis carried out, it can be concluded from the research that has been carried out that the application of the *Multi Factor Evaluation Process* (MFEP) method for selecting the best employees makes it easier for leaders to select the best employees at PT. ALS. The decision support system application program for selecting the best employees with the MFEP method can provide the best decision results or alternatives in assisting the selection of the best employees at PT. ALS.

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