International Journal of Information System & Technology
Akreditasi No. 36/E/KPT/2019 | Vol. 5, No. 2, (2021), pp. 233-239

The Application of the MOORA Method in the Decision Making System for the Selection of the Best Employees at CV. Lautan Mas

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Abstract

Employees are one of the important elements in the running of the activities of a company CV. Ocean Mas. Therefore, employees are always required to always provide the best quality service in their work to increase consumer confidence and maintain competitiveness between companies engaged in the same field. To motivate and determine the quality of service work from each employee, a method is needed to be applied in helping the company in the decision-making system to determine the best employees. Where the method applied in determining the best employees is the Multi-Objective Optimization method on the basis of Ratio Analysis Simple (MOORA). With the application of the MOORA method, it can produce good, effective, and professional decisions in accordance with the best value, which is ranked 1. So with the application of the MOORA method, it can assist the company in determining its best employees effectively and professionally every period.

Keywords: *Cv.*Lautan Mas, MOORA Method, Best Employees, Decision Making System

1. Introduction

Employees are one of the important elements in the running of the company's activities CV. Lautan Mas which is engaged in the export and import of fish. Employees are always required to provide good service quality to increase competitiveness between companies engaged in the same field. The company always emphasizes to employees to provide the best quality service to consumers or customers so that consumer confidence is maintained and is also in demand by the wider community. Therefore, management needs to evaluate performance and business efforts that can stimulate or motivate employees to always provide good service quality at work. To know the importance of the quality of work of the employees, then the company needs to select the best employees and be given awards to spur employee performance so that they compete to improve their respective education and performance. Thus, employees will always improve the quality of their services, so that customer satisfaction is maintained and other positive things that will have a positive impact on the company because of their human resources [1][2].

However, the process of selecting the best employees in the company's environment is a challenge for both managers and management, because this is a complicated matter and becomes a big obstacle. Where so far, managers choose the best employees only using their own perspective or interpretation according to existing criteria, making it less effective and less professional in determining the best employees. Therefore, we need a system for making decisions on selecting the best employees in an objective and professional manner. In solving complex and complex problems, many fields of computer science to solve these problems can be seen from the number of researchers in solving these problems, such as in the field

ISSN : 2580-7250

of data mining [3][4][5], the field of image processing[6][7], as well as in the field of decision support systems[8][9]. Based on that, researchers use the field of decision support systems in solving existing problems.

In the field of decision support systems, many methods are used to solve complex problems, namely the Multi-Objective Optimization method on the basis of Ratio Analysis Simple (MOORA), Adiitive Weighting Method (SAW), Profile Matching, and Analytic Hierarchy Process (Analytic Hierarchy Process) methods. AHP), and other methods[10][11][9][12]. Based on that, the researcher uses the Multi-Objective Optimization method on the basis of Ratio Analysis Simple (MOORA) in solving the existing problem, namely the selection of the best employees at CV. Lautan Mas.

The MOORA method is a method that can produce the best decisions according to the rankings to support the management in determining the best employees [8]. Other researchers also said that the MOORA method is the highest alternative that can be used to determine decision criteria compared to other methods such as Topsis, Vikor, and ARAS methods.[13]. The MOORA method is also applied to solve problems with complex mathematical calculations to choose a superior alternative among the existing alternatives.[10]. Other researchers also say the moora method is the right and effective method in supporting decision making[13][14]. There are still many other previous researchers who apply the MOORA method in helping decision making, such as[15] in the selection of the best cow breeds, [16] selection of majors, and many more apply the MOORA method in solving complex problems.

selection of the best employees in the CV. Lautan Mas by applying the MOORA method. With the application of this method, it will help the management or manager in the decision-making system to determine the best employees in an effective and professional manner.

2. Research Methodology

To get the desired results, namely the decision-making system for selecting the best employees at CV. Lautan Mas, then the following stages of research.

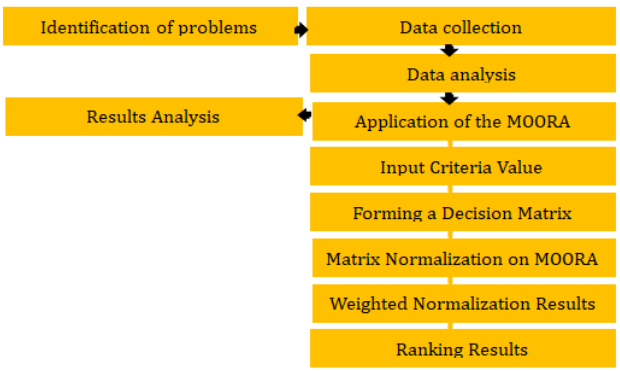

Figure 1. Research Stages

The information from the research stages is as follows:

1) Identification of problems
   At the problem identification stage, the researcher determines what the problems are in determining the best employees at CV. Lautan Mas.
2) Data collection
   Researchers collected data with several activities, namely conducting interviews, observations and collecting literature related to determining the best employees at CV. Lautan Mas:

a). Observation

Observations in this study were conducted by researchers. Observations in this study are direct observations, namely seeing and observing directly, then recording behavior and events that occur in actual conditions regarding the selection of the best employees by participating in assessment activities carried out by the assessment team and recording structured events that occur in the field related with research.

b). Interview

The interviews in this study used unstructured interviews because the researchers considered this model to be the most flexible, where the subjects were given the freedom to describe their answers and express their views freely and according to the day in determining the best employees.

c). Literature collection

The team collects reliable sources in the form of national and international scientific journals related to the topic to be researched.

3) Data analysis

At this stage, the process of compiling data that is feasible to be used as part of the application of the Moora method is carried out, starting from the criteria data used and alternative data to solve existing problems.

4) Application of the MOORA Method

The MOORA method is applied for processing alternative data and criteria data into calculations to get the best employee rankings, where the completion process is as follows:

a). Input Criteria Value

Inputting the criterion value on alternative data where the value will be processed and the result will be a decision

b). Forming a Decision Matrix

Forming a Decision Matrix MOORA represents all available information for each attribute in the form of a decision matrix.

c). Matrix Normalization on MOORA

This normalization is used to uniform the alternative values of each criterion. Normalization in MOORA can be calculated by the following equation:

$$X^*ij = \frac{Xij}{\sqrt{[\sum_{j=1}^{m} S_{ij}^2]}} \quad (1)$$

d). Weighted Normalization Results

If the attributes or criteria for each alternative are not given a weighted value. The normalized size is added in the maximization case (for favorable attributes) and subtracted in the minimization (for unfavorable attributes) if formulated then:

$$Yj* = \sum xij\ i{=}g * i{=}1 - \sum xij\ i{=}n * i{=}g{+}1 \quad (2)$$

e). Ranking Results

Determining the Rank Value from the results of the MOORA calculation. Ranking of each alternative will be given.

5) Results Analysis

After being given a ranking for each alternative data through the results of the Moora calculation, it will be analyzed which alternative data is the best employee.

3. Results and Discussion

In the decision-making system for selecting the best employees, calculations must be made using the MOORA method and determine who is the best employee according to the criteria obtained through the primary source Cv, Lautan Mas. Where the company has had problems in the decision-making system in selecting

the best employees. Based on that, the MOORA method needs to be applied to assist the management in making decisions to choose the best employees. The moora method (multi-objective optimization on the basis of ratio analysis) was introduced by Brauers and Zavadskas in 2006,[10]. The alternative data are summarized to determine who is the best employee among the available alternatives through the calculation process for the application of MOORA according to the existing criteria:

Table1. Alternative Data

Alternative	Employee name
A1	Gloria Beatriche
A2	Geofani
A3	Bona Manihuruk
A4	Gracia
A5	Rosi Sagala
A6	Maria

Furthermore, table 2 is a table containing the criteria used.

Table 2. Criteria

Criteria	Information	Weight	Type
C1	Performance	0.25	Benefits
C2	Discipline	0.25	Benefits
C3	Interaction	0.15	Benefits
C4	Teamwork	0.15	Benefits
C5	Attitude and Behavior	0.20	Benefits

3.1. Sub Criteria Weighting

In this process, weighting is carried out on the sub-criteria that have been summarized. Table 3 follows the weighting of the Performance sub-criteria (C1)

Table 3. Performance sub-criteria weighting

Performance	Information	Weight
90	Very good	15
80	Well	7
60	Enough	3
0	Bad	0

Furthermore, the following table 4 is the weighting for the Discipline sub-criteria (C2).

Table 4. Discipline sub-criteria weighting (C2)

Discipline	Information	Weight
90	Very good	15
80	Well	7
60	Enough	3
0	Bad	0

Furthermore, the following table 5 is the weighting for the Interaction sub-criteria (C3).

Table 5. Interaction sub-criteria weighting (C3)

Interaction	Information	Weight
90	Very good	8
80	Well	5
60	Enough	2
0	Bad	0

Furthermore, the following table 6 is the weighting for Teamwork (C4)

Table 6. Cooperation sub-criteria weighting (C4)

attitude and Teamwork	Information	Weight
90	Very good	8
80	Well	5
60	Enough	2
0	Bad	0

Furthermore, the following table 7 is a weighting for attitudes and behavior (C5)

Table 7. Attitude and behavior sub-criteria weighting (C5)

Duties and responsibilities	Information	Weight
90	Very good	9
80	Well	7
60	Enough	4
0	Bad	0

Table 8 is the value obtained from the suitability rating between the alternatives and the criteria

Table 8. Alternative suitability ratings and criteria

Alternative	C1	C2	C3	C4	C5
A1	70	75	75	80	80
A2	70	75	75	80	85
A3	90	75	60	80	60
A4	75	75	70	60	70
A5	60	80	75	80	80
A6	70	80	80	90	90

3.2. Application of the MOORA Method

After obtaining the weighted alternative values, then the decision processing is carried out using the MOORA method. The following are the steps for calculating the MOORA Method.

a). Determine the decision matrix X taken from table 8.

$$X=\begin{pmatrix} 70 & 75 & 75 & 80 & 80 \\ 70 & 75 & 75 & 80 & 85 \\ 90 & 75 & 60 & 80 & 60 \\ 75 & 75 & 70 & 60 & 70 \\ 60 & 80 & 75 & 80 & 80 \\ 70 & 80 & 80 & 90 & 90 \end{pmatrix}$$

b). Then normalize the x matrix using the 1st equation for the performance criteria (C1).

$$X^{*}1.1 = \frac{70}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.3912$$

$$X^{*}2.1 = \frac{70}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.3912$$

$$X^{*}3.1 = \frac{90}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.5029$$

$$X^{*}4.1 = \frac{75}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.4191$$

$$X^*5.1 = \frac{60}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.3353$$

$$X^*6.1 = \frac{70}{\sqrt{70^2 + 70^2 + 90^2 + 75^2 + 60^2 + 70^2}} = 0.3912$$

As is rare above, the same is done up to criteria C5.So that the results of the normalization of the X matrix obtained by the Xij* matrix can be seen below.

$$X^*_{i,j} = \begin{vmatrix} 0{,}3912 & 0{,}3992 & 0{,}4207 & 0{,}4142 & 0{,}4180 \\ 0{,}3912 & 0{,}3992 & 0{,}4207 & 0{,}4142 & 0{,}4442 \\ 0{,}5029 & 0{,}3992 & 0{,}3366 & 0{,}4142 & 0{,}3135 \\ 0{,}4191 & 0{,}3992 & 0{,}3927 & 0{,}3107 & 0{,}3658 \\ 0{,}3353 & 0{,}4258 & 0{,}4207 & 0{,}4142 & 0{,}4180 \\ 0{,}3912 & 0{,}4258 & 0{,}4488 & 0{,}4660 & 0{,}4703 \end{vmatrix}$$

c) Calculating the optimization value using the 2nd equation

Y*1 = (0.25*0.3912)+(0.25*03992)+(0.15*0.4207)+(0.15*0.4142)+(0.20*0.4180) = 0.4064

Y*2 = (0.25*0.3912)+(0.25*03992)+(0.15*0.4207)+(0.15*0.4142)+(0.20*0.4442) = 0.4117

Y*3 = (0.25*0.5029)+(0.25*03992)+(0.15*0.3366)+(0.15*0.4142)+(0.20*0.3135) = 0.4009

Y*4 = (0.25*0.4191)+(0.25*03992)+(0.15*0.3927)+(0.15*0.3107)+(0.20*0.3658) = 0.3832

Y*5 = (0.25*0.3353)+(0.25*0.4258)+(0.15*0.4207)+(0.15*0.4142)+(0.20*0.4180) = 0.3991

Y*6 = (0.25*0.3912)+(0.25*0.4258)+(0.15*0.4488)+(0.15*0.4660)+(0.20*0.4703) = 0.4355

d). Determining the Rank Value of Each Alternative from the Calculation Results

The results of the calculation of the optimization value can be seen in the table of ranking results for each of the following alternative data:

Table 9. Ranking Results of Each Alternative Data

Alternative	Employee name	Score	Rank
A1	Gloria Beatriche	0.4064	3
A2	Geofani	0.4117	2
A3	Bona Manihuruk	0.4009	4
A4	Gracia	0.3832	6
A5	Rosi Sagala	0.3991	5
A6	Maria	0.4355	1

3.3. Results Analysis

From the ranking results in table 9 above, the analysis of data from the process of applying the moora method produces an alternative A6 (Maria) who is the best employee at Cv. Lautan Mas.

4. Conclusion

From the results of research in the selection of the best employees at CV. Lautan Mas based on the existing criteria, that the application of the MOORA method can produce the best alternative, which is ranked 1 out of every available alternative. With the application of the method, it can help the company in making decisions to determine the best employees effectively and professionally every period.

Acknowledgments

Thank you STMIK Pelita Nusantara for funding Lecturer research in 2021.

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