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Decision Support System for Permanent Employee Selection at PT XYZ with Moora Method

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ABSTRACT

Using the multi-objective optimization method based on ratio analysis (MOORA), the purpose of this research is to develop a decision support system that will help the selection process of permanent employees at PT XYZ. In order to improve the productivity and operational efficiency of the company, a proper employee selection process is essential. Nonetheless, many factors influence the decision taken, which is often subjective. Therefore, a systematic approach is needed to help managers assess and select potential employees based on predefined standards. The MOORA method was chosen because it is able to provide optimal solutions for a variety of different criteria. The identification of employee selection criteria, the collection of employee candidate data, and the use of the MOORA method to generate employee candidate rankings are all actions performed in this study. The results of the analysis show that this system helps decision making and increases managers' confidence in choosing employees who match the company's needs. PT XYZ hopes to use this decision support system to reduce errors in the employee selection process and help achieve the company's strategic goals. It is hoped that this research will help the process of developing decision support systems in the field of human resources.

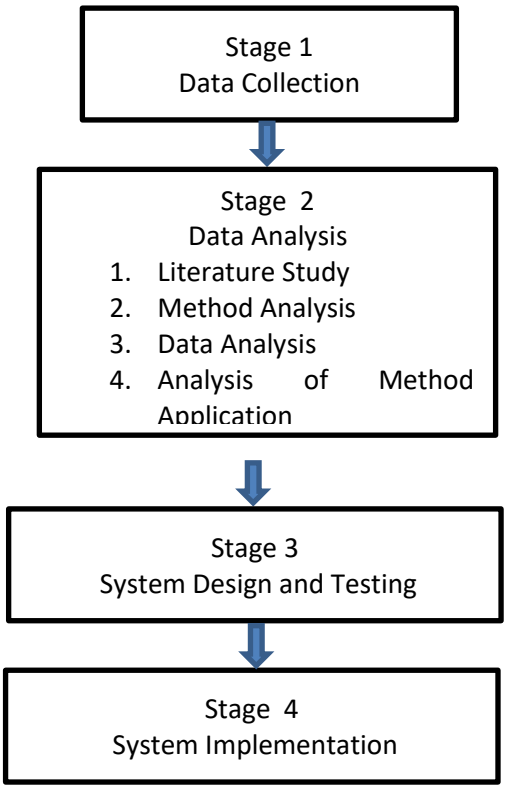
INTRODUCTION

In a company will often encounter things that require decision making, in making decisions it must be precise and accurate. Therefore, accurate data is needed, this decision is very important because it is possible that the results of the decision will greatly affect the survival of the company. Similarly, PTXYZ requires accurate data to select permanent employees. This is a strategic decision and affects many factors in the company. For this reason, accurate and precise data is needed before deciding on a strategic matter. With this need, the researcher intends to help solve the problem with a Decision Support System with the Moora method. PT XYZ is a mobile company that often selects permanent employees in the service sector, covering East Java and parts of Central Java. In reality, the company is not ready to select permanent employees. Manual administration problems make PT XYZ less efficient in selecting permanent employees. Therefore, the author wants to build a system that can help companies make decisions to select permanent employees and do it more efficiently. One of the models that can be used to build a decision support system is the MOORA (Multi-Objective Decision Making) Method. In addition to test scores, other criteria required for a permanent employee selection system are experience and psychotest results. The assessment must be carried out to determine whether the decision is accurate. so that the company can make a decision to become a permanent employee of PT XYZ based on the results of the assessment.

The comparison of Moora's method with other methods in Decision Support Systems is that the first method is very simple, stable, and robust, and does not even require complex mathematical calculations. In addition, the Moora method also has more accurate and targeted results in helping decision-making. The MOORA method is even simpler and easier to use than other methods.

Research Framework Method: This method is used by researchers to collect information and compare it with a predetermined standardization or measure. can be seen in Figure 1.

Figure 1 Research Framework



According to the Decision Support System (DSS) is an interactive information system that provides information, modeling, and data manipulation .The system is used to assist decision making in semi-structured situations and unstructured situations, where no one knows exactly how the decision should be made. DSS applications use data, provide easy user interfaces, and can combine the thinking of decision makers. DSS is more intended to support management in doing analytical work in situations that are less structured and with less clear criteria. DSS is not intended to automate decision making, but provides an interactive tool that allows decision makers to perform various analyses using available models.

According to Decision support System (Decision Support System) is an information system at the management level of an organization that combines data and sophisticated analysis models or data analysis tools to support decision making for semi-structured and unstructured decisions. [The decision support system was first introduced in the early 1970s by Michael S. Scott with the term Management Decision System which is a computer-based system that assists decision making by utilizing data and models to solve unstructured problems.

The MOORA method is a method introduced by Brauers and Zavadkas (2006). This relatively new method was first used by Brauers (2003) in a multi-criteria decision.

The MOORA method is flexible and easy to understand in separating the subjective part of the evaluation process into decision weight criteria with multiple decision-making attributes. This method has a good level of selectivity because it can determine the purpose of conflicting criteria. Where criteria can be worth profitable (benefit) or unfavorable (cost) [5].

Moora's method is a multiobjective system that optimizes two or more conflicting attributes simultaneously. This method is applied to solve problems with complex mathematical calculations. MOORA method was introduced by Brauers and Zavadkas (2006). This method was first used by Braurers in 2004 in a multi-criteria retrieval. MOORA method is widely applied in fields such as management, building, contracting, road design, and economics.[6] This method has a good level of selectivity in determining an alternative. The approach taken by MOORA is defined as a process simultaneously to optimize two or more conflicting constraints (Yuan Sa'adati, Sofiansyah Fadli, Journal Publications & Research in Informatics Engineering [7]).

Four steps of problem solving using the MOORA method, among others:

a. Create a decision matrix

$$X = \begin{bmatrix} X_{11} & X_{12} & \dots & Xmn \\ X_{21} & X_{22} & \dots & Xmn \\ \dots & \dots & \dots & \dots \\ Xn_1 & Xn_2 & \dots & Xmn \end{bmatrix}$$

b. Perform normalization on matrix x

$$X^*_{ij} = \frac{Xij}{\sum_{i=1}^{m} Xij^2} \quad (2)$$

c. Determine the weighted normalization matrix

$$Wj * Xij \quad (3)$$

d. Determining the Preference Result

$$Yi = \sum_{j=1}^{g} wjX * ij - \sum_{j=g+1}^{n} wjXij \quad (4)$$

RESULTS AND DISCUSSION

In this problem, the selection of permanent employees using the MOORA method will be discussed, as for the first step that will be taken in

carrying out the calculation, it must determine the assessment criteria that have been determined. The criteria used can be seen in table 1 below:

The first step that will be taken is to determine the direction of the goal and identify the attributes of the evaluation concerned**.**

Tabel 1. Data Mentah Calon Seleksi

Kriteria	**Keterangan**	**Nilai Bobot**	**Jenis**
C1	Jenjang Pendidikan	20%	Benefit
C2	Pengalaman	25%	Benefit
C3	Wawancara	25%	Benefit
C4	Hasil Psikotes	30%	Benefit

Table 2. Data nama calon seleksi

Alternafir	Keterangan
A1	Abdullah
A2	Azizah
A3	Rudi Hartono
A4	Zaki Muhammad
A5	Zafira Humairah

In this problem will be discussed about the selection of permanent employees using the MOORA method, as for the first step that will be taken in performing the calculation is to determine the assessment criteria that have been determined. The criteria used can be seen in table 1 below:

The first step is to determine the direction of the goal and identify the evaluation attributes concerned.

Tabel 3. Pemberian Nilai Setiap Alternatif

Alternatif	**C1**	**C2**	**C3**	**C4**
A1	Cukup Sesuai	Sangat Baik	Baik	Sangat Baik
A2	Sesuai	Baik	Baik	Sangat Baik

	dengan Kriteria			
A3	Sesuai dengan Kriteria	Baik	Sangat Baik	sangat Baik
A4	Kurang Sesuai	Sangat Baik	Baik	Baik
A5	Sesuai dengan Kriteria	Baik	Cukup	Baik

The alternative changes are as follows:

Tabel 4. Perubahan Nilai Setiap Alternatif

Alternatif	**C1**	**C2**	**C3**	**C4**
A1	4	4	5	4
A2	5	4	4	4
A3	5	5	4	5
A4	3	3	5	4
A5	5	5	4	3

Based on the data above, the decision matrix can be obtained in the following table:

Tabel 5. Matriks Keputusan

4	4	5	4
5	4	4	4
5	5	4	5
3	3	5	4
5	5	4	3

Then the results can be seen in the matrix below:

Tabel 6 . Hasil Matriks Ternormalisasi Terbobot

0.0800	0.1048	0.1263	0.1325
0.1000	0.1048	0.1010	0.1325
0.1000	0.1310	0.1010	0.1656
0.0600	0.0786	0.1263	0.1325

0.1000	0.1310	0.1010	0.0994

Langkah IV : Determine the Preference Value with the following formula:

$$Yi=\sum_{j=1}^{g} wjX * ij-\sum_{j=g+1}^{n} wjXij$$

Tabel 7. Pencarian Nilai Yi

Alternatif	Max (C1+C2+C3+C4)	Min (0)	Yi=Max-Min
A1	**(0.0800+0.1048+0.1263+0.1325)**	**0**	**0.4436**
A2	**(0.1000+0.1048+0.1010+0.1325)**	**0**	**0.4384**
A3	**(0.1000+0.1310+0.1010+0.1656)**	**0**	**0.4977**
A4	**(0.0600+0.0786+0.1263+0.1325)**	**0**	**0.3974**
A5	**(0.1000+0.1310+0.1010+0.0994)**	**0**	**0.4314**

The ranking results are shown below:

Tabel 8. Perankingan

Alternatif	Yi	Rangking
A1	0.4436	2
A2	0.4384	3
A3	0.4977	1
A4	0.3974	5
A5	0.4314	4

From this process, it can be concluded that A3 is the best alternative, so from several candidates who will be selected to become permanent employees, it is found that those who deserve to become permanent employees based on the criteria with the completion of the MOORA method are Alternative A3 named **Rudi Hartono**.

CONCLUSION

The implementation of the Moora method on a decision support system for determining permanent employee candidates that have been completed can be drawn several conclusions including:

a. The Moora method is applied in the selection of criteria for determining the type of permanent employee candidates by determining the criteria that have been determined, then the criteria value is calculated in the matrix value and the final result of the calculation can be displayed in the report results.

b. The decision-making system is built using the Visual Basic 2010 application and uses the MysQl database. This system is built with UML design to facilitate the determination of the Criteria selection.

c. Decision support systems with the Moora method in solving problems regarding the determination of permanent employee candidates can be tested with the system built.

SUGGESTIONS

This research still has several limitations, namely:

The data used in this study is still limited. The assessment method used can still be developed further. Therefore, further research needs to be done to expand the data used in this study. Develop more accurate and objective assessment methods.

BIBLIOGRAPHY

T. Mufizar, A. T. Hidayatuloh, Nanang Suciyono, and A. H. Hanifah, "Application of the MOORA Method to the Overseas Internship Employee Selection Decision Support System (Case Study: PT Hinai Daiki)," Metik J., vol. 5, no. 1, pp. 42-46, 2021, doi: 10.47002/metik.v5i1.214.

F. Indina, I. Purnama, and S. Z. Harahap, "Analysis of SAW Method in SPK to Determine the Best Customer," JIKOMSI [Journal of Computing Science and Information Systems], vol. 4, no. 2, pp. 7-14, 2021.

B. Apriyanto and A. Fathoni, "Decision Support System for New Employee Admission at PT XYZ," Formosa J. Sci. Technol., vol. 3, no. 7, pp. 1647-1660, 2024, doi: 10.55927/fjst.v3i7.10454.

D. Novianti and A. B. H. Yanto, "Laptop Selection Decision Support System Using Simple Additive Weighting Method," J. Technol. Inform. and Comput., vol. 5, no. 2, pp. 70-75, 2019, doi: 10.37012/jtik.v5i2.177.

U. L. Sari, "Decision Support System for Determining CCTV Installation Locations with the MOORA Method (Case Study: Binjai City Transportation Office)," Semin. Nas. Inform., pp. 123-133, 2021, [Online]. Available: https://ejournal.pelitaindonesia.ac.id/ojs32/index.php/SENATIKA/article/view/1146

K. Kusmanto, M. B. K. Nasution, S. Suryadi, and A. Karim, "Decision Support System in Recommending the Eligibility of Credit Recipient Customers Applying the MOORA and MOOSRA Methods," Build. Informatics, Technol. Sci., vol. 4, no. 3, pp. 1284-1292, 2022, doi: 10.47065/bits.v4i3.2610.

T. Shabrina and B. Sinaga, "Application of the MOORA Method to the Decision Support System for Determining Students Receiving Poor Assistance," J. Comput. and Business Science, vol. 12, no. 2a, pp. 161-172, 2021, doi: 10.47927/jikb.v12i2a.214.