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UTILIZATION MOORA FOR CANDIDATES FOR THE ELECTION OF OSIS CHAIRMAN AT STATE SMP 11 TANJUNG BALAI

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Abstract: The election of the Student Council President is an important process in building a democratic, responsible, and integrity-based leadership culture in the school environment. In addition, through the main discussion in this study aims to optimize the selection process for candidates for Student Council President at SMP Negeri 11 Tanjung Balai through the implementation of a Decision Support System (DSS) based on the MOORA (Multi-Objective Optimization on the Basis of Ratio Analysis) method. The MOORA method is used to normalize values, weight criteria, and calculate optimization values to produce the best alternative ranking. Data were obtained through observation, interviews with school officials, and literature studies. The results of the study indicate that the MOORA method is able to provide objective and transparent ranking results, where M. Asril Sitorus Pane obtained the highest score of 0.347 (Rank 1), followed by M. Rian with a score of 0.333 (Rank 2). The implementation of this system is expected to be able to provide recommendations for the best candidates regularly and accurately, so that it can support fairer and more accountable decision-making in the next Student Council President election.

Keywords: decision support system; osis chairman election; MOORA; SMP negeri 11 tanjung balai.

Abstrak: Pemilihan Ketua OSIS merupakan proses penting dalam membangun budaya kepemimpinan yang demokratis, bertanggung jawab dan berintegritas di lingkungan sekolah. Selain itu, melalui pokok pembahasan pada penelitian ini bertujuan untuk dapat mengoptimalkan proses seleksi calon Ketua OSIS di SMP Negeri 11 Tanjung Balai melalui penerapan Sistem Pendukung Keputusan berbasis metode MOORA (Multi-Objective Optimization on the Basis of Ratio Analysis). Metode MOORA digunakan agar dapat melakukan normalisasi nilai, pembobotan kriteria serta perhitungan nilai optimasi guna menghasilkan peringkat alternatif terbaik. Data diperoleh melalui observasi, wawancara dengan pihak sekolah serta dan studi kepustakaan. Hasil penelitian menunjukkan bahwa metode MOORA mampu memberikan hasil peringkat yang objektif dan transparan, yang dimana M. Asril Sitorus Pane memperoleh nilai tertinggi sebesar 0,347 (Peringkat 1), diikuti oleh M. Rian dengan nilai 0,333 (Peringkat 2). Penerapan sistem ini diharapkan mampu memberikan rekomendasi kandidat terbaik secara sistematis dan akurat, sehingga dapat mendukung pengambilan keputusan yang lebih adil dan akuntabel dalam pemilihan Ketua OSIS selanjutnya.

Kata kunci: MOORA; pemilihan ketua osis; sistem pendukung keputusan; SMP negeri 11 tanjung balai.

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INTRODUCTION

The use of information technology in education can optimize the learning process and shape students to utilize technology in the teaching and learning process. In addition to the teaching and learning process, information technology can be utilized in all aspects of education, one of which is used for the election of the OSIS chairman at school [1] .

The election of the Intra-School Student Organization (OSIS) is a strategic tool in developing leadership potential, responsibility, and organizational skills [2] . This study aims to be able to implement a Decision Support System using the MOORA method in the process of selecting the OSIS Chairperson at SMP Negeri 11 Tanjung Balai in order to produce recommendations for the best candidates objectively, measurably, transparently and also to assist the school in determining the best candidates based on predetermined criteria [3] .

The Intra-School Student Organization (OSIS) is an official forum for students to develop leadership, responsibility, and democratic participation. In carrying out its role, OSIS plays a crucial role as a communication bridge between students and the school. Therefore, the election of the OSIS president is a highly strategic activity, determining the direction, spirit, and effectiveness of the student organization throughout its term.

However, the election process for the student council president in many schools, including SMP Negeri 11 Tanjung Balai, is still carried out manually or based solely on student choice, without consultation with teachers, and based solely on voting results without in-depth analysis of the candidates' qualities and competencies. As a result, the election results sometimes do not fully reflect the best abilities of the candidates. This process is also often influenced by subjective factors such as popularity or personal closeness with other students, rather than objective leadership abilities and achievements. The criteria for selecting the student council president at SMP Negeri 11 Tanjung Balai are: Morals, Insight, Communication Skills, Discipline, and Responsibility.

To overcome these problems, a system is needed that can assist the assessment process and decision-making objectively based on clear criteria. One solution that can be implemented is a Decision Support System (DSS). DSS functions to help decision-makers in selecting the best alternative based on a number of criteria that can be measured systematically [4] . A decision support system is an effective system that can help users make complex decisions based on their own alternatives, standards and preferences. The decision-making system uses decision rules, analytical models, comprehensive databases and decision-making knowledge [5] .

MOORA is a multi-objective system that optimizes two or more conflicting attributes simultaneously. This method is applied to solve problems with complex mathematical calculations [6] . In this study, the MOORA (Multi-Objective Optimization by Ratio Analysis) method is used. The MOORA method is known as a decision-making method. The basic principle of this method is to give weight to each assessment

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criterion, then carry out a weighted summation process to determine the highest preference value as the best result [7] .

Meanwhile, the application of the Several previous studies have strengthened the effectiveness of the MOORA method in decision support systems [7] . Another study showed that the MOORA method is effective in determining the best alternative through systematic weighting [8] . Therefore, this study will raise the research title, namely "Utilization of the MOORA SPK for the Election of OSIS Chairperson at SMP N 11 Tanjung Balai".

METHOD

In this research, the researcher used a quantitative method, which emphasizes a broader and deeper understanding of the issues raised. This method aims to provide a descriptive understanding of the issues being discussed. The data collected using this method consists primarily of numbers rather than letters, words, or images. The theoretical basis used to explain this theoretical framework ::

Image 1. Research Framework Image

The initial stage of this research is problem identification, where researchers must first determine the problem to be studied. For example, the election process for the student council president at SMP Negeri 11 Tanjung Balai is still carried out manually. Election results are often influenced by popularity, not candidate competence. There is no computer-based system to assist in the objective selection process.

Data collected from various sources. Data collection in this study was conducted using three methods: interviews, direct observation, and literature review. The following data was obtained:

Table 1. For OSIS Chairperson

No	Name
1	Afriana Br. Sembiring
2	Ancient Syakila Moon
3	Maulida Safri
4	Wulan Ramadhani
5	Ridho
6	Mr. Rian
7	M. Asril Sitorus Pane
8	Oziel Ananta
9	Laura Aulia Sabrina
10	Maulida Rahma

In addition, the MOORA method in this study was applied through systematic stages, such as the first step is to compile a decision matrix containing all alternatives and assessment criteria. with the following formula:

$$Xij = \begin{bmatrix} X_{11} & X_{12} & \dots & X_{1n} \\ X_{21} & X_{22} & \dots & X_{2n} \\ \dots & & & \\ X_{m1} & X_{m2} & \dots & X_{mn} \end{bmatrix} \quad (1)$$

The second step is to normalize the decision matrix to equalize the scale

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between criteria. Normalization in the MOORA method uses the square root of the sum of squares approach, with the formula:

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

The third step is to assign weights to each criterion according to its level of importance. If wj represents the weight of the jth criterion, then the weighted value is calculated using the formula:

$$Yi = \sum_{j=1}^{n} wj \; x \; ij \quad (3)$$

The fourth step is to calculate the optimization value of each alternative by adding up all the benefit criteria and subtracting the cost criteria.

The final step is to rank the alternatives based on the Yi value . The alternative with the highest value is ranked highest because it represents the most optimal combination of criteria values.

System design is an activity of designing and determining how to process information systems from the results of system analysis so that it can meet the needs of users, including designing user interfaces, data and process activities, as well as designing models using flowmaps to describe system workflows and UML (unified modeling language), namely by creating use case diagrams, class diagrams, activity diagrams and sequence diagrams.

System development is a form of planned organizational change. At this stage, software will be installed to support implementation and testing in this research. The software used is PHP, Sublime Text 3, and a MySQL database.

The system testing stage begins by inputting data into the application using a black box.

After being built and tested, it is then implemented. The results of this stage cover the system's implementation, which will be implemented if approved, including the programs created during the system design phase and the system's trials to ensure it is ready for operation.

RESULTS AND DISCUSSION

This Results and Discussion section presents a complete description of the output of the decision support system built by applying the MOORA (Multi-Objective Optimization on the Basis of Ratio Analysis) method in the selection process for the Student Council Chairperson at SMP Negeri 11 Tanjung Balai. The results obtained represent a concrete implementation of candidate data processing based on predetermined criteria and weights. The data is then systematically analyzed to generate preference scores that reflect the level of eligibility of each candidate. Determine the factors and factor weights where the total weighting must be equal to 1 (Σ weighting = 1), namely factor weight.

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Table 2. Alternative Analysis Data

No	Name	C1	C2	C3	C4	C5
1	Afriana Br. Sembiring	Very good	Wide	Good	Discipline	Responsible
2	Ancient Syakila Moon	Very good	Wide	Quite good	Discipline	Very Responsible
3	Maulida Safri	Very good	Very wide	Good	Very Disciplined	Responsible
4	Wulan Ramadhani	Very good	Wide	Good	Discipline	Responsible
5	Ridho	Very good	Wide	Very good	Very Disciplined	Responsible
6	Mr. Rian	Very good	Very wide	Very good	Discipline	Very Responsible
7	M. Asril Sitorus Pane	Very good	Very wide	Very good	Very Disciplined	Very Responsible
8	Oziel Ananta	Very good	Very wide	Very good	Discipline	Responsible
9	Laura Aulia Sabrina	Very good	Very wide	Good	Discipline	Very Responsible
10	Maulida Rahma	Very good	Wide	Very good	Very Disciplined	Responsible

Table 3. Analysis Data for Each Alternative for Each Criteria

No	Name	C1	C2	C3	C4	C5
1	Afriana Br. Sembiring	5	4	4	4	4
2	Ancient Syakila Moon	5	4	3	4	5
3	Maulida Safri	5	5	4	5	4
4	Wulan Ramadhani	5	4	4	4	4
5	Ridho	5	4	5	5	4
6	Mr. Rian	5	5	5	4	5
7	M. Asril Sitorus Pane	5	5	5	5	5
8	Oziel Ananta	5	5	5	4	4
9	Laura Aulia Sabrina	5	5	4	4	5
10	Maulida Rahma	5	4	5	5	4

To determine the transformation value into the X matrix, the value of the results of the suitability rating above is made into a matrix.

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$$X = \begin{array}{|c|c|c|c|c|} \hline 5 & 4 & 4 & 4 & 4 \\ \hline 5 & 4 & 3 & 4 & 5 \\ \hline 5 & 5 & 4 & 5 & 4 \\ \hline 5 & 4 & 4 & 4 & 4 \\ \hline 5 & 4 & 5 & 5 & 4 \\ \hline 5 & 5 & 5 & 4 & 5 \\ \hline 5 & 5 & 5 & 5 & 5 \\ \hline 5 & 5 & 5 & 4 & 4 \\ \hline 5 & 5 & 4 & 4 & 5 \\ \hline 5 & 4 & 5 & 5 & 4 \\ \hline \end{array}$$

Then normalize the X matrix into the R matrix. After getting the results, you will be able to see the normalization value (R) in the table below:

Table 4. Normalization of Each Alternative for Each Criteria

No	Alternative	C1	C2	C3	C4	C5
1	Afriana Br. Sembiring	0.316	0.279	0.284	0.286	0.286
2	Ancient Syakila Moon	0.316	0.279	0.213	0.286	0.357
3	Maulida Safri	0.316	0.349	0.284	0.357	0.286
4	Wulan Ramadhani	0.316	0.279	0.284	0.286	0.286
5	Ridho	0.316	0.279	0.355	0.357	0.286
6	Mr. Rian	0.316	0.349	0.355	0.286	0.357
7	M. Asril Sitorus Pane	0.316	0.349	0.355	0.357	0.357
8	Oziel Ananta	0.316	0.349	0.355	0.286	0.286
9	Laura Aulia Sabrina	0.316	0.349	0.284	0.286	0.357
10	Maulida Rahma	0.316	0.279	0.355	0.357	0.286

After getting the results, you will be able to see the optimization value in the table below:

Table 5. Optimization of Each Alternative for Each Criteria

Criteria Code	C1	C2	C3	C4	C5
Attribute	Benefits	Benefits	Benefits	Benefits	Benefits
Weight Value	0.20	0.15	0.20	0.20	0.25
Afriana Br. Sembiring	0.063	0.042	0.057	0.057	0.071
Ancient Syakila Moon	0.063	0.042	0.043	0.057	0.089
Maulida Safri	0.063	0.052	0.057	0.071	0.071
Wulan Ramadhani	0.063	0.042	0.057	0.057	0.071
Ridho	0.063	0.042	0.071	0.071	0.071
Mr. Rian	0.063	0.052	0.071	0.057	0.089
M. Asril Sitorus Pane	0.063	0.052	0.071	0.071	0.089
Oziel Ananta	0.063	0.052	0.071	0.057	0.071
Laura Aulia Sabrina	0.063	0.052	0.057	0.057	0.089
Maulida Rahma	0.063	0.042	0.071	0.071	0.071

The final stage is ranking based on the obtained optimization values. The alternative with the highest optimization value is considered the best choice and becomes the primary recommendation for decision-making.

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Table 6. Alternative Ranking Results

Alternative	Results	Ranking
Afriana	0.290	7
Ancient Syakila	0.294	6
Maulida Safri	0.315	5
Wulan Ramadhani	0.290	7
Ridho	0.319	3

Table 6. Alternative Ranking Results

Alternative	Results	Ranking
Mr. Rian	0.333	2
M. Asril Sitorus	0.347	1
Oziel Ananta	0.315	5
Laura Aulia	0.318	4
Maulida Rahma	0.319	3

Table 7. Results of Determining Candidates for OSIS Chairperson Before Implementing the MOORA Method

No	Candidate Name	Leadership	Academic	Organizational Activity	Personality	Initial Ranking
1	M. Asrini Sitorus Pane	88	85	90	87	1
2	Mr. Rian	85	84	88	85	2
3	Ridho	83	82	85	80	3
4	Maulida Rahma	82	81	84	79	4
5	Laura Aulia Sabrina	80	80	82	78	5
6	Maulida Safri	79	78	80	77	6
7	Oziel Ananta	78	77	79	76	7
8	Ancient Syakila Moon	76	75	78	74	8
9	Afriana Br. Sembiring	75	74	76	73	9
10	Wulan Ramadhani	74	73	75	72	10

From Table 7 Alternative Ranking Results, it can be seen that the implementation of the Decision Support System using the MOORA method successfully produced preference values and rankings for each candidate for OSIS Chairperson objectively and measurably. From the calculation results, M. Asril Sitorus Pane was ranked first with the highest score of 0.347. Second place was occupied by M. Rian with a score of 0.333, followed by Ridho and Maulida Rahma who both obtained a score of 0.319 and ranked third. The results of these calculations are then visualized and documented through a MOORA-based decision support system display. The first image shows the Ranking page, which contains the final results of the MOORA calculation.

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Image 2. MOORA Ranking Display

On The second image displays a bar graph depicting each participant's total score. This visualization supports the ranking table by presenting a clearer and more communicative comparison of scores

Image 3. Ranking Graphic Display

CONCLUSION

Decision Support Systems (DSS) with the MOORA method in the election of the Student Council Chairperson at SMP Negeri 11 Tanjung Balai, it can be concluded that the application of this method is able to provide a more objective, structured, and transparent selection process. The calculation results show that M. Asrini Sitorus Pane obtained the highest score in first place. The second position was achieved by M. Rian, followed by Ridho and Maulida Rahma in third place. The relatively small difference in scores between candidates indicates that all candidates have quite good competence, but the MOORA method is able to identify alternatives with the most optimal scores based on the accumulation of criteria.

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