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Employing PIPRECIA-S weighting with MABAC: a strategy for identifying organizational leadership elections

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ABSTRACT

The election of organizational leaders, especially in organizations whose members have diverse backgrounds and interests, can cause various problems. Problems in the selection of school organization leaders include the absence of an objective selection of organizational leadership candidates because they are selected based on comparisons between candidates without considering the criteria in the selection of organizational leadership candidates. Research related to the multi-attributive border approximation area comparison (MABAC) and simplified pivot pairwise relative criteria importance assessment (PIPRECIA-S) methods has never been conducted so far, so it is a reference in conducting this research using the MABAC and PIPRECIA-S methods. This study aims to select the head of the school organization using the MABAC method and PIPRECIA-S weighting can increase the objectivity of the criteria assessment results by relying on calculations from the PIPRECIA-S weighting method. Based on the selection results using the MABAC method and PIPRECIA-S weighting, candidate 1 was recommended as the leader of the school organization because it achieved rank 1 with a total score of 0.293. The contribution of this research is to help in the selection of the head of the organization using the PIPRECIA-S and MABAC methods as a decision-making solution.

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1. INTRODUCTION

Information systems are a collection of components that interact to collect, process, store, and provide information for users to support decision-making, coordinate activities, and achieve organizational goals [1]. Information systems provide various advantages for organizations and businesses in various aspects, including increasing organizational productivity and competitiveness in a competitive market, as well as increasing customer satisfaction and other stakeholders. The selection of the head of the organization, especially in organizations that involve members with diverse backgrounds and interests, can cause various problems [2]. Problems that exist in the selection of the head of the school organization include the lack of objective selection of candidates for the head of the organization because it is chosen based on comparisons between candidates with one another candidate without looking at the criteria in the selection of candidates for the head of the organization. To overcome problems in the selection of the head of the organization, it is important to implement a transparent, fair, open selection process, and the criteria used in the selection of candidates for the head of the school organization [3]. A solution that can be an alternative in the selection of candidates for the head of the school organization by using a decision support system (DSS).

DSS is an approach in information systems designed to assist decision-making in organizations [4], [5]. DSS provides relevant tools and information to assist managers, professionals, and other decision-makers in analyzing situations, identifying alternatives, and selecting best solution to a particular problem or task [6], [7]. DSS helps organizations improve decision-making efficiency, reduce risk, and better support the achievement of organizational goals [8], [9]. With DSS, decision makers can manage information complexity, identify patterns, and evaluate alternatives more systematically [10], [11]. Multi-attributive border approximation area comparison (MABAC) is a multi-criteria decision-making (MCDM) method that focuses on comparing border approach areas between evaluated alternatives in terms of predefined attributes designed to evaluate alternatives based on several predefined criteria.

MABAC a method in multi-criteria decision analysis (MCDA), is used to compare alternatives based on various criteria [12]–[14]. This method is used to make decisions where several criteria or attributes must be considered for a process in making a decision [15], [16]. The MABAC method is used to consider various criteria and provide a better understanding of how these alternatives overlap with established criteria [17], [18]. This helps in making more comprehensive informed decisions rather than just looking at one criterion separately [19]–[21]. However, this method also has disadvantages, namely the lack of ability of this method to handle interactions between criteria or less sensitive to changes in the weight of criteria [22]. Weighting is often subjective by decision makers, which can produce inconsistent results. Policy decision-making requires consistency in assigning weight to criteria. Imbalances or inconsistencies in weights can result in unreliable decisions. The MABAC method has several advantages that make it a useful approach in MCDM. One of its advantages is its ability to handle uncertainty and ambiguity in the assessment of criteria. Using a fuzzy approach in evaluating relative boundaries between alternatives, MABAC makes it possible to consider the degree of uncertainty in the assessment, which often occurs in real situations. In addition, MABAC is relatively simple in its implementation and allows flexibility in determining decision-making preferences, making it suitable for a wide range of complex decision-making applications. Its ability to generate consistent and stable ratings of alternatives also makes MABAC a reliable tool in multi-criteria analysis. The MABAC method is extended to the ranking of alternative solutions and the determination of optimal solutions to produce an alternative [16]. One way to overcome the problem of weighting criteria is to use the simplified pivot pairwise relative criteria importance assessment (PIPRECIA-S) weighting model in the MABAC method.

PIPRECIA-S is one of the methods used in multi-criteria analysis to determine the importance or weight of the criteria used. This method is a simple and fast approach of completing the process of weighting criteria to obtain a relative comparison between given criteria [23]–[25]. In the weighting method using the PIPRECIA-S approach, the value of each criterion is compared with the value of the first criterion in each comparison. This results in the weight of criteria that are not based on direct consideration from the decision maker, but rather based on a predetermined order of comparison. The PIPRECIA-S method is used in comparing the significance of other criteria with the significance of the first criterion. This method facilitates the assessment of the relative importance of the criteria with a more direct and easily understandable approach. PIPRECIA-S directs decision makers to compare criteria in pairs, focusing on consideration of relative preferences between criteria. By simplifying the evaluation process, PIPRECIA-S provides a framework that is easier to implement without sacrificing validity and accuracy in the weighting of criteria. Thus, this approach becomes an attractive option for situations where the complexity of the analysis needs to be simplified without sacrificing the quality of the decision [26]–[28]. A further step after using the PIPRECIA-S method is to assign relative weights to each criterion based on the comparison results. These weights are then applied in the evaluation of alternatives to consider the decision maker's preference for each criterion. This process allows for a more focused assessment of the aspects considered most important in the context of ongoing decision-making. The main advantage of this approach is the ease of implementation and interpretation, which allows for wider application in a variety of decision-making situations. Thus, PIPRECIA-S can be a useful tool to simplify the multi-criteria analysis process without sacrificing the accuracy or validity of decisions.

Research related to the MABAC and PIPRECIA-S methods has never been carried out as far as the author sought in previous studies, so this is a reference in conducting this research using the MABAC and PIPRECIA-S methods. The combination of PIPRECIA-S and MABAC is a potential novelty in this study, PIPRECIA-S is used in determining the weight of criteria while MABAC is used in existing alternative rankings. The combination of weighting between PIPRECIA-S and MABAC weighting methods offers a powerful approach to decision making. PIPRECIA-S allows accurate determination of criteria weighting by considering relative preferences between criteria, while MABAC provides a framework for evaluating alternatives by considering the relative limits between different alternatives. The combination of these two methods allows for a more holistic and in-depth analysis in the assessment of criteria and alternatives, which can assist decision makers in making more informed and accurate decisions. By harnessing the power of each method, this combination can improve the quality and objectivity of the decision-making process in a variety of contexts.

This study aims to select the head of the school organization using the MABAC method and PIPRECIA-S weighting to ensure objectivity of criteria assessment results based on application of criteria weighting techniques by applying the PIPRECIA-S method. The weighting combination of PIPRECIA-S and MABAC methods makes a significant contribution to the decision-making process by improving the quality and objectivity of evaluation. The weighting of criteria using PIPRECIA-S enables accurate decision-making considering the relative preferences between criteria, whereas MABAC provides a framework that allows for a comprehensive evaluation of alternatives considering the relative constraints between different alternatives. The combination of these two methods results in a holistic and comprehensive analysis, which can assist decision makers in making more informed and accurate decisions. By integrating the strengths of each method, this combination not only strengthens decision validity, but also speeds up the overall decision-making process, thus making a valuable contribution in a variety of decision-making contexts.

2. METHOD

This study aims to select the head of the school organization using the MABAC method and weighting using the PIPRECIA-S method is directed to ensure objectivity in the assessment of criteria. With the application of the criterion weighting method using PIPRECIA-S, efforts are made to ensure that the results are based on objective consideration of relative preferences between criteria. Figure 1 is the stages of research carried out as shown below.

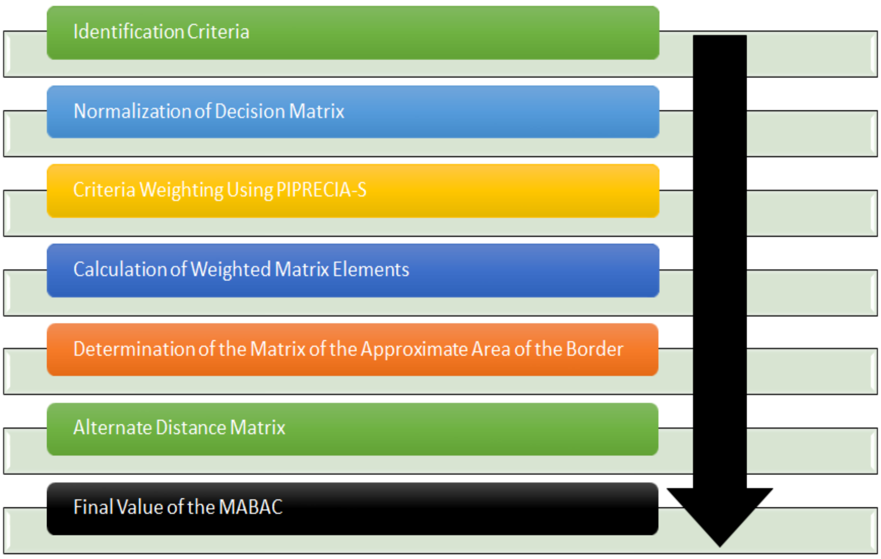

Figure 1. Stages of research

The initial phase involves the research phase, during which a comprehensive investigation and data collection is carried out for the resolution of the problem of determining the head of the student organization, the first stage is identifying the criteria, then normalizing the decision matrix. After that the PIPRECIA-S weighting method is used to determine the weight of the criteria to be applied, then perform weighted matrix element calculations, as well as determining the matrix if the estimated border area, next calculate the alternate distance matrix and finally calculate the final value of MABAC. The research stages are stages in solving problems in determining the head of the student organization, a detailed explanation of the research stages is as follows.

2.1. Identification criteria

The process of collecting needs in research requires accuracy, clarity, and accuracy to ensure that research objectives are well achieved, and research results have a positive impact. Interviews carry out the collection of needs to obtain problems regarding the selection of candidates for student organization president and then determine the criteria used in determining candidates for student organization president. In this identification stage, conducting interviews with the school about problems in the selection of candidates for the head of the organization, problems that occur in the selection of the head of the organization there are no criteria used in the selection of candidates for the head of the organization. The results of collecting needs with the school also want there to be criteria used in the selection of candidates for the head of the organization, based on the results of discussions with the school, the criteria that will be used in the selection of candidates for the head of the organization are knowledge, organizational liveliness, communication, ethics, responsibility, and discipline.

2.2. The assessment of the weight of the criteria is carried out by the PIPRECIA-S method

PIPRECIA-S is a method commonly used in MCDM. This method aims to determine the relative importance or weight of a variety of different criteria when evaluating available alternatives [29]. This method is designed to simplify the process of assessing criterion weights compared to more complex methods while still providing a structured approach to decision-making [25]. The calculation process in the weighting method using PIPRECIA-S consists of the following steps.

The importance of assigning S_j is the relative significance of each criterion refers to the degree of importance of each criterion in the context of relative comparison between one criterion and another, except for the first criterion, is so that we can make more precise comparisons between the criteria in a grading or electoral system. The relative significance of S_j for different criteria helps in identifying important differences between factors influencing a decision or evaluation, thus enabling more informed decision making. By carefully assigning S_j relative significance to each criterion except the first, we can minimize bias and ensure that evaluations are more objective and accurate.

$$S_j = \begin{cases} > 1 & if\ c_j > c_1 \\ 1 & if\ c_j = c_1 \\ < 1 & if\ c_j < c_1 \end{cases} \tag{1}$$

The value of k_j coefficient is very important in pairwise comparison analysis because it determines the extent to which one criterion is more important or significant than another. The k_j coefficient is used to measure the preferences or relative weights given by a decision maker to each criterion to make more rational and measurable decisions. The determination of the appropriate value of the k_j coefficient requires careful and doable consideration and helps to interpret the preferences of decision makers numerically.

$$k_j = \begin{cases} 1 & if\ j = 1 \\ 2 - s_j & if\ j > 1 \end{cases} \tag{2}$$

The weight of q_j describes the relative significance of each criterion to provide clarity as to which is more important in an evaluation or comparison context. By calculating q_j weight, we can avoid uncertainty in decision making, as we can quantitatively assess and understand the impact of each criterion on the outcome. This helps ensure decisions are more informed and in line with predefined priorities.

$$q_j = \begin{cases} 1 & if\ j = 1 \\ \frac{1}{k_j} & if\ j > 1 \end{cases} \tag{3}$$

The calculation of the relative final weight of the criteria is an important stage in the decision-making process involving various factors or criteria, which allows us to give an assessment or weight to each criterion according to its importance. By calculating the relative final weight of the criteria, we can summarize the contribution of each criterion to the final decision in a single number or percentage, making it easier for decision-makers to recognize the most relevant factors. It helps in prioritizing criteria more objectively and ensures that the decisions taken reflect the desired values or objectives that have been set in a multi-criteria analysis.

$$w_j = \frac{q_j}{\sum_{k=1}^{n} q_k} \tag{4}$$

2.3. Multi-attributive border approximation area comparison method

MABAC is a method used in MCDM. It involves several important stages to evaluate alternatives based on some attributes or criteria [30]–[33]. The following will be explained in detail the steps of solving in the MABAC method.

The first stage in this method makes a decision matrix (X) from the results of the assessment of each alternative against the existing criteria. The formula of the decision matrix (X) is as (5):

$$X = \begin{bmatrix} r_{11} & \cdots & r_{1n} \\ \vdots & \ddots & \vdots \\ r_{m1} & \cdots & r_{mn} \end{bmatrix} \tag{5}$$

The second step in this method involves normalizing the decision matrix that has been made to produce the normalization matrix, the normalization formula is divided into two based on the type of criteria present. For criteria of benefit type using (6), while criteria type cost using (7), normalization is as:

$$N_{ij} = \frac{x_{ij} - x_i^-}{x_i^+ - x_i^-} \tag{6}$$

$$N_{ij} = \frac{x_{ij} - x_i^+}{x_i^+ - x_i^-} \tag{7}$$

Stages of calculation of weighted matrix elements where the formula can be seen as (8):

$$V_{ij} = (w_j \times n_{ij}) + w_j \tag{8}$$

The calculation of the determination of the matrix of the approximate area of the border (G) where the formula can be seen as (9):

$$g_i = \left(\prod_{j=1}^{m} V_{ij}\right)^{1/m} \tag{9}$$

The calculation of the alternate distance matrix element from the approximate border area where the formula can be seen as (10):

$$Q_{ij} = V_{ij} - G_i \tag{10}$$

The calculation of the final value of the MABAC method for each alternative where the formula can be seen as (11):

$$S_i = \sum_{j=1}^{n} Q_{ij} \tag{11}$$

After obtaining the final score of the MABAC method, then make alternative rankings based on the highest final score.

3. RESULTS AND DISCUSSION

The criteria used in selecting the head of the school organization are knowledge, organizational activity, communication, ethics, responsibility, and discipline. These criteria are obtained based on collecting needs to the student department in selecting prospective organizational leaders, these criteria are always used by the student affairs department in selecting prospective organizational leaders who have registered. The criteria data used are shown in Table 1.

The criteria table does not contain the weight of each criterion, for the weight of each criterion using the PIPRECIA-S method in determining the weight of the criteria to be used in the calculation of the MABAC method. The order of criteria is the level of importance of each existing criterion based on the results of the collection of needs made to the school. The assessment data from the existing alternatives amounted to 6 alternatives with the assessment range for each alternative namely 1 to 6 shown in Table 2.

Table 1. School organization leader selection criteria data

Criteria code	Criteria name	Criteria type
C1	Knowledge	Benefit
C2	Organizational liveliness	Cost
C3	Communication	Benefit
C4	Ethics	Benefit
C5	Responsibility	Benefit
C6	Discipline	Benefit

Table 2. Alternative data for school organization leadership candidates

Alternative code	Alternative name	Criteria code					
		C1	C2	C3	C4	C5	C6
NA-1	Candidate 1	80	85	89	79	90	87
NA-2	Candidate 2	78	83	87	78	80	85
NA-3	Candidate 3	81	85	89	80	86	87
NA-4	Candidate 4	79	84	88	79	84	86
NA-5	Candidate 5	81	86	90	81	91	88
NA-6	Candidate 6	82	86	90	81	88	88

The scores in the assessment data are determined based on the team from the student section in determining the value of each criterion of prospective candidates who register, the assessment data is used based on observations from the assessment team from the student section at the school in assessing each candidate who registers in the process of selecting organizational leaders. The assessment scale carried out by the assessment team from the student affairs section of the school ranges from 0 to 100. The assessment data was obtained based on the assessment of the student section in the school in determining the grades of prospective leaders of the organization, the assessment data became the primary source of data in this study to determine and produce assessments using the MABAC method from prospective leaders of the organization.

3.1. Calculation of criteria weighting using PIPRECIA-S method

PIPRECIA-S is a method used to evaluate the relative importance of a criterion in the decision-making process. The process involves comparing the importance of each criterion with the others and assigning a numerical value that represents its relative importance. The PIPRECIA-S method was used in this study to determine the weight of each criterion. The following are the steps in the calculation of criteria weighting using the PIPRECIA-S method.

Assigning relative significance, specifically S_j values, to every criterion, except the initial one, is crucial for enhancing the precision of comparisons within a grading or electoral system. The relative significance of S_j associated with various criteria aids in pinpointing significant distinctions among factors impacting a decision or assessment, thereby facilitating more enlightened decision-making. Meticulously establishing the relative significance of S_j values for each criterion, excluding the first, enables us to mitigate biases and guarantee a higher degree of objectivity and precision in evaluations.

The k_j coefficient holds significant importance in pairwise comparison analysis as it dictates how much one criterion outweighs or surpasses another in terms of significance. This coefficient is employed to gauge the preferences, or the relative importance attributed by a decision maker to each criterion, enabling a more rational and quantifiable decision-making process. Calculating the suitable k_j coefficient involves thoughtful consideration and facilitates the numeric interpretation of decision makers' preferences.

The q_j weight indicates the relative importance of each criterion, offering clarity regarding which holds greater significance in an evaluation or comparison scenario. The computation of q_j weight allows us to eliminate ambiguity in decision-making, as it enables a quantitative evaluation and comprehension of the influence of each criterion on the ultimate result. This process aids in guaranteeing that decisions are better informed and aligned with established priorities.

Determining the relative overall weight of criteria is a crucial step in the decision-making process that involves multiple factors or criteria. This process enables us to assign an evaluation or weight to each criterion based on its significance. Through the computation of the relative final weight of criteria, we can condense the role of each criterion in the final decision into a single numerical value or percentage, simplifying the recognition of the most pertinent factors for decision-makers. This approach fosters a more objective prioritization of criteria and ensures that decisions made align with the desired values or objectives established in a multi-criteria analysis. Using the PIPRECIA-S method, the weights for each criterion have been calculated and the results are represented in Table 3.

Table 3. Weight data on school organization chair selection criteria

Criteria code	S_j value	k_j value	q_j value	Criteria weights
C1	1	1	1	0.196
C2	1	1.2	0.833	0.164
C3	0.4	1.2	0.833	0.164
C4	0.5	1	1	0.196
C5	0.2	1.4	0.714	0.140
C6	0.3	1.4	0.714	0.140

3.2. Calculation of school organization leader election using the MABAC method

The procedure for using the MABAC method includes a series of specific steps. At this stage, a decision matrix (X) is formed from the results of the evaluation of each alternative based on Table 2 using (5). The results of this decision matrix are listed.

$$X = \begin{bmatrix} x_{11} & x_{12} & x_{13} & x_{14} & x_{15} & x_{16} \\ x_{21} & x_{22} & x_{23} & x_{24} & x_{25} & x_{26} \\ x_{31} & x_{32} & x_{33} & x_{34} & x_{35} & x_{35} \\ x_{41} & x_{42} & x_{43} & x_{44} & x_{45} & x_{46} \\ x_{51} & x_{52} & x_{53} & x_{54} & x_{55} & x_{56} \\ x_{61} & x_{62} & x_{63} & x_{64} & x_{65} & x_{66} \end{bmatrix}$$

Matrix X is a 6×6 matrix where there are 6 rows that describe existing alternatives, and 6 columns that describe existing criteria. The value of the decision matrix is taken from alternative assessment data against the criteria, the results of the decision matrix can be seen as follows.

$$X = \begin{bmatrix} 80 & 85 & 89 & 79 & 90 & 87 \\ 78 & 83 & 87 & 78 & 80 & 85 \\ 81 & 85 & 89 & 80 & 86 & 87 \\ 79 & 84 & 88 & 79 & 84 & 86 \\ 81 & 86 & 90 & 81 & 91 & 88 \\ 82 & 86 & 90 & 81 & 88 & 88 \end{bmatrix}$$

The next step is to normalize the decision matrix (X) that has been made, resulting in a normalization matrix. The benefit criterion is calculated using (6), while the cost criterion is calculated using (7). The results of the calculation of the normalization matrix for all criteria can be found in Table 4.

Table 4. Results of decision matrix normalization

Alternative code	Alternative name	Criteria code					
		C1	C2	C3	C4	C5	C6
NA-1	Candidate 1	0.50	0.33	0.67	0.33	0.91	0.67
NA-2	Candidate 2	0.00	1.00	0.00	0.00	0.00	0.00
NA-3	Candidate 3	0.75	0.33	0.67	0.67	0.55	0.67
NA-4	Candidate 4	0.25	0.67	0.33	0.33	0.36	0.33
NA-5	Candidate 5	0.75	0.00	1.00	1.00	1.00	1.00
NA-6	Candidate 6	1.00	0.00	1.00	1.00	0.73	1.00

Stages of calculation of weighted matrix elements. This method performs calculations from the multiplication between the normalized matrix and the weight of the criterion using (8) and the approximate matrix of boundary area (G) using (9). Generate the weighted matrix element calculation and the border area estimate matrix in Table 5.

Table 5. Calculation of weighted matrix

Alternative code	Alternative name	Criteria code					
		C1	C2	C3	C4	C5	C6
NA-1	Candidate 1	0.294	0.219	0.273	0.261	0.267	0.233
NA-2	Candidate 2	0.196	0.328	0.164	0.196	0.140	0.140
NA-3	Candidate 3	0.343	0.219	0.273	0.327	0.216	0.233
NA-4	Candidate 4	0.245	0.273	0.219	0.261	0.191	0.187
NA-5	Candidate 5	0.343	0.164	0.328	0.392	0.280	0.280
NA-6	Candidate 6	0.392	0.164	0.328	0.392	0.242	0.280
MatriX G		0.2944	0.2206	0.2570	0.2960	0.2171	0.2194

The process of calculating the alternate distance matrix elements from the estimated border area (Q) uses (10), while the final value of each alternative is calculated using (11). The results of these calculations, along with the final values of each alternative, are presented in Table 6. After getting the final score from the MABAC method, the next step is to do an alternative final ranking based on the highest score from each alternative or candidate for the head of the school organization. The results of the ranking of school organization president elections are shown in Table 7. Based on the selection of school organization leaders using the MABAC method and PIPRECIA-S weighting, it is recommended for candidate 6 as a candidate for school organization leader because the final ranking results get rank 1 with a total value of 0.293.

Table 6. Alternate distance matrix element from the approximate border area and final value of each alternative

Alternative code	Alternative came	Criteria code						Total value of alternatives
		C1	C2	C3	C4	C5	C6	
NA-1	Candidate 1	0.000	-0.002	0.016	-0.035	0.050	0.014	0.042
NA-2	Candidate 2	-0.098	0.107	-0.093	-0.100	-0.077	-0.079	-0.340
NA-3	Candidate 3	0.049	-0.002	0.016	0.031	-0.001	0.014	0.107
NA-4	Candidate 4	-0.049	0.053	-0.038	-0.035	-0.026	-0.033	-0.129
NA-5	Candidate 5	0.049	-0.057	0.071	0.096	0.063	0.061	0.283
NA-6	Candidate 6	0.098	-0.057	0.071	0.096	0.025	0.061	0.293

Table 7. MABAC ranking results

Student organization president candidate	Total value of alternatives	Ranking
Candidate 6	0.293	1
Candidate 5	0.283	2
Candidate 3	0.107	3
Candidate 1	0.042	4
Candidate 4	-0.129	5
Candidate 2	-0.340	6

3.3. Criterion weight sensitivity analysis

Criterion weight sensitivity analysis is an approach used in decision making to evaluate how sensitive decision outcomes are to changes in criterion weighting. In this analysis, the weight of the criteria is treated as a variable that can be varied to see its impact on the outcome of the decision. This process helps decision makers to understand the extent to which changes in priorities or the importance of certain criteria may affect the final outcome [34]. Taking into account variations in criteria weighting, sensitivity analysis provides valuable insight into decision stability and allows identification of criteria that most influence overall outcomes. Thus, criterion weight sensitivity analysis becomes an important tool in informed and effective decision making, helping to mitigate uncertainty and ensuring that decisions are the best in a variety of scenarios [35], [36]. Criterion weight sensitivity analysis is the process of evaluating the extent to which decision outcomes from a DSS may change or be affected by variations in the weights assigned to each criterion [37], [38]. The goal is to understand the degree of sensitivity of decisions to changes in the weight of criteria and evaluate how robust the system is to variations in user preferences or priorities [22]. To test sensitivity using a weight reduction of 10% from the highest criteria weights (C1 and C4). The results of the weight change are as presented in Table 8.

Table 8. Criterion weight sensitivity analysis

	C1	C2	C3	C4	C5	C6
Original	0.196	0.164	0.164	0.196	0.140	0.140
Test 1	0.176	0.174	0.174	0.176	0.150	0.150
Test 2	0.159	0.183	0.183	0.159	0.159	0.159
Test 3	0.143	0.191	0.191	0.143	0.167	0.167
Test 4	0.129	0.198	0.198	0.129	0.174	0.174

Changes in the weight of the criteria against the final value of each alternative are presented Table 9. Visualization of alternative ranking results based on criteria sensitivity analysis as shown in Figure 2. The results of the ranking of the selection of candidates for the head of the organization based on changes in sensitivity analysis from the criteria by conducting as many as 4 experiments did not affect the ranking obtained by each alternative. Based on the test results, we conclude that the MABAC method using PIPRECIA-S weighting is quite stable based on the results of changes in the weight of existing criteria.

Table 9. MABAC ranking results

Student organization president candidate	Original		Test 1		Test 2		Test 3		Test 4	
	Total value	Rank	Total value	Rank	Total value	Rank	Total value	Rank	Total value	Rank
Candidate 6	0.293	1	0.281	1	0.274	1	0.270	1	0.266	1
Candidate 5	0.283	2	0.277	2	0.270	2	0.260	2	0.251	2
Candidate 3	0.107	3	0.101	3	0.095	3	0.090	3	0.086	3
Candidate 1	0.042	4	0.052	4	0.060	4	0.068	4	0.074	4
Candidate 4	-0.129	5	-0.123	5	-0.119	5	-0.115	5	-0.111	5
Candidate 2	-0.340	6	-0.331	6	-0.323	6	-0.315	6	-0.308	6

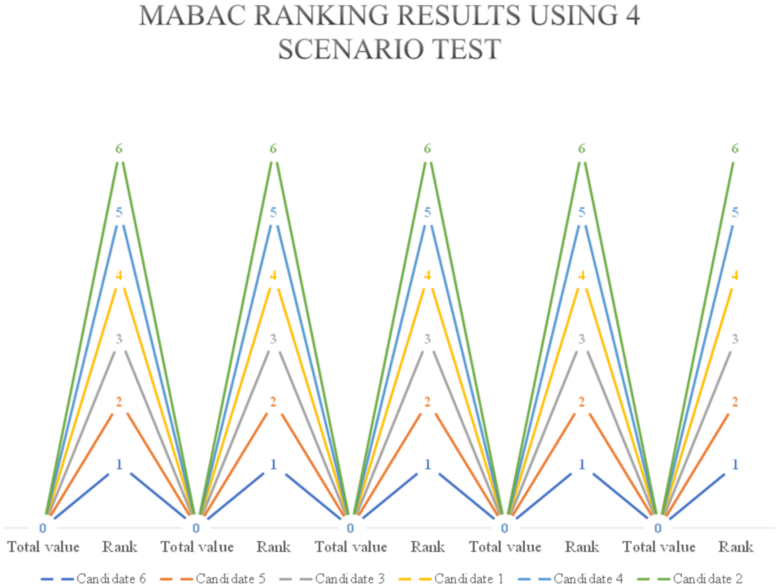

Figure 2. MABAC ranking results using 4 scenario test

3.4. Discussion

In previous studies using the MABAC method, the stability of the results obtained was established through sensitivity analysis, and the MABAC method was utilized to solve MCDM problems. This method allows decision-makers to determine the relative weight of each attribute as well as perform pairwise comparisons between alternatives. In addition, this approach provides flexibility to account for uncertainty and variabilities in attribute assessment. Using MABAC, decision-makers can gain a more holistic and in-depth understanding of the options available, facilitating a more informed and effective decision-making process. In the case of determining candidates for the head of the organization in schools, the MABAC and PIPRECIA-S methods help provide recommendations for choosing the head of the school organization. In selecting the head of the organization, the MABAC method can be an effective approach; it evaluates and compares candidates based on several relevant attributes or criteria. The MABAC method enables holistic decision-making by considering various essential aspects. This approach aims to elect an organizational leader who not only excels in one aspect but is also capable of aligning the necessary skills and character to lead the organization successfully.

4. CONCLUSION

This study has the aim to establish leadership in the organizational structure of schools by adopting the MABAC method and PIPRECIA-S weighting. This is expected to increase the objectivity of the assessment process through the application of accurate calculations from the PIPRECIA-S method. Combining PIPRECIA-S and MABAC weighting methods provides a robust approach to decision making. PIPRECIA-S allows for an accurate determination of criteria weighting by considering relative preferences between criteria, while MABAC provides a framework for evaluating alternatives by taking into account the relative differences between them. The combination of these two methods enables a more holistic and in-depth analysis in the assessment of criteria and alternatives, which can assist decision-makers in making more informed and precise decisions. The selection results of school organization leaders using the MABAC method and PIPRECIA-S weighting recommended candidate 1 as the leader for school organizations because they received Rank 1 with a total score of 0.293. These findings can be evaluated and used as a reference for classifying school organization leaders in the future. Further research is encouraged to include additional criteria in determining organizational leaders.

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