



RAM-MEREC (Root Assessment Method - Method based on Removal Effects of Criteria): A Synergistic Approach to Weight Derivation and Alternative Ranking in the Selection of the Best Intern Employees

Permata¹, Junhai Wang², Setiawansyah^{1,*}, A. Ferico Octaviansyah Pasaribu³, Agung Deni Wahyudi⁴

¹ Faculty of Engineering and Computer Science, Informatics, Universitas Teknokrat Indonesia, Bandar Lampung, Indonesia

² Department of Commerce and Circulation, Zhejiang Technical Institute of Economics, Zhejiang, China

³ Faculty of Engineering and Computer Science, Technology Information, Universitas Teknokrat Indonesia, Bandar Lampung, Indonesia

⁴ Faculty of Engineering and Computer Science, Information System, Universitas Teknokrat Indonesia, Bandar Lampung, Indonesia

Email: ¹permata@teknokrat.ac.id, ²340017@zjtie.edu.cn, ^{3,*}setiawansyah@teknokrat.ac.id, ⁴fericopasaribu@teknokrat.ac.id, ⁵agung.wahyudi@teknokrat.ac.id

Correspondence Author Email: setiawansyah@teknokrat.ac.id

Abstract—An effective intern selection process requires an objective and systematic approach to decision-making, especially when it involves multiple assessment criteria. This study proposes a combined approach of RAM-MEREC, which is a combination of Method based on Removal Effects of Criteria (MEREC) and Root Assessment Method (RAM), as a method to improve accuracy and reliability in the best internal selection. MEREC is used to objectively determine the weight of criteria based on the impact of the elimination of each criterion on the overall outcome. Meanwhile, RAM is used to generate alternative rankings by considering the root impact of value changes on each candidate's performance. The results of the application of this method show that RAM-MEREC is able to provide a more representative weighting and a more stable and consistent final ranking. The results of the application of this method show that RAM-MEREC is able to provide a more representative weighting and a more stable and consistent final ranking. The results of the calculation of the total score of all alternatives using the evaluation method that has been determined, obtained that Alternative 10 is the best candidate with the highest score of 1.4378, followed by Alternative 6 with a score of 1.4375 and Alternative 3 with a score of 1.4375. This approach not only improves the quality of decision-making, but also minimizes subjectivity and bias in the selection process.

Keywords: RAM; MEREC; Weighting Criteria; Alternative Ranking; Decision Support System

1. INTRODUCTION

Performance evaluation in the context of internship programs has a crucial role as a basis for identifying the achievements, potentials, and contributions of interns to the organization (Hendrastuty et al., 2024). Through a structured evaluation process, companies can assess the extent to which interns understand and apply the technical and soft skills needed. In addition, performance evaluations help companies recognize aspects that need improvement, both in terms of the individual and the internship coaching system itself. With an objective and comprehensive evaluation, the company is able to maintain the quality of the work learning environment while ensuring that interns really get meaningful and relevant experience to the professional world. The selection of the best interns is also a strategic step in human resource development, especially in the search for superior talent from an early age. This selection process is not only a form of appreciation for extraordinary performance, but also serves as a motivation for other participants to continue to develop. In the long run, the best interns selected through the right evaluation methods can be potential candidates for permanent employee recruitment (Lia Hananto et al., 2021; Siburian & Sahriani, 2023). Therefore, it is important for organizations to have a decision support system that is able to evaluate objectively, fairly, and accurately, in order to determine the best interns based on various relevant criteria such as work ethic, adaptability, innovation, and team collaboration. (Aljofarinski & Utama, 2022; Sinaga et al., 2021) The main problem in evaluating the performance and selecting the best interns lies in the lack of an objective, consistent, and structured appraisal system. Many organizations still rely on subjective judgments from supervisors or mentors who tend to be influenced by personal perceptions, emotional closeness, or brief experiences during the internship. This causes potential interns to not be assessed thoroughly and fairly, so they risk causing dissatisfaction, demotivation, or even losing potential for superior talent. Without a data-driven approach and systematic decision-making methods, the process of selecting the best interns tends to be non-transparent and difficult to account.

The main challenge in achieving the objectivity of the performance assessment of interns is the diversity of evaluators' viewpoints and the lack of uniform assessment standards (Hariyanto et al., 2025; Yudhistira & Wahyudi, 2024). Assessments are often influenced by subjective factors such as personal impressions, participants' communication styles, or evaluators' different experiences in coaching. This results in the value given can be inconsistent between evaluators, even against the same criteria. In addition, not all evaluators have the same understanding of the definition and scope of each assessment criteria, so different interpretations can result in inconsistencies in scoring (Setiawansyah & Rahmanto, 2025). On the other hand, determining the weight of criteria is also a significant challenge in ensuring the fairness and accuracy of evaluation results (Wang et al., 2024; Yudhistira et al., 2024). Criteria such as work ethic, technical ability, innovation, or teamwork have varying levels of importance depending on the needs of the organization or the position being applied for. However, without a systematic weighting approach, weighting is often intuitive or perfunctory. This opens up room for bias and reduces the quality of the final



decision. Therefore, an objective weighting method is needed that is able to analyze the variation of assessment data to determine the weight of the criteria mathematically and based on actual information (Wang et al., 2025).

The Method based on Removal Effects of Criteria (MEREK) is one of the objective weighting approaches in multi-criteria decision-making (MCDM) that aims to determine the importance of a criterion based on its influence on alternative ranking results (Dua et al., 2024; Mishra et al., 2024; Ulutaş et al., 2023). In contrast to other weighting methods that rely on the subjective perceptions or preferences of decision-makers, MEREK systematically analyzes changes in alternative overall scores when one criterion is eliminated, so that the weights obtained truly reflect the informative impact of each criterion on the overall decision-making process. The MEREK method has a number of advantages that make it superior in the process of determining criteria weight objectively in multi-criteria decision-making. One of its main advantages is its ability to evaluate the level of importance of each criterion based on its real impact on the final outcome. By analyzing changes in alternative scores when a criterion is removed, MEREK provides a weight that truly reflects the contribution of each criterion in distinguishing alternative quality (Dua et al., 2024; Keshavarz-Ghorabae, 2021; Mishra et al., 2022). This makes the weighting process fairer and free from the subjective biases that often arise in perception-based methods or expert preferences. In addition, MEREK is flexible and can be applied to various areas of decision-making, including employee selection, performance evaluation, and selection of the best interns. With a data-driven and analytical approach, MEREK is able to improve transparency, accuracy, and reliability in the decision support system (Mishra et al., 2024).

The Root Assessment Method (RAM) is one of the methods in the MCDM that aims to evaluate and determine alternative rankings based on a number of criteria (Trung, 2024; Trung et al., 2024). This method is known for its simple yet effective approach, where the assessment is done by calculating the square root of the normalized and weighted value of the criteria. Each alternative value to a criterion is multiplied by the weight of that criterion, then the result is rooted, and the final value of each alternative is the sum of the roots. The higher the RAM value of an alternative, the better the alternative. The advantage of RAM lies in its ability to reduce the dominance of extreme values and provide stable and proportionate evaluation results to the contribution of each criterion (Biswas et al., 2024; Mohamed et al., 2024; Sotoudeh-Anvari, 2023). This method is suitable for use in a variety of decision-making contexts, especially when a quick and easy-to-understand approach is required without sacrificing ranking accuracy. One of the advantages of RAM is its simplicity and ease of application, since its calculation steps are relatively easy to understand and do not require special software. In addition, RAM is able to minimize the influence of extreme values through the use of square roots in the evaluation process, so that the final result becomes more balanced and not distorted by one value that is too high or too low. This method also provides a stable and proportionate outcome to the weight of each criterion, ensuring that every aspect of the assessment contributes fairly to the final decision (Sotoudeh-Anvari, 2023).

Previous research has explored various methods in decision support systems (SPK) for the selection of the best employees. The research by Ginting (2024) uses the WASPAS method which combines the Weighted Sum Model (WSM) and Weighted Product Model (WPM) approaches to produce employee rankings based on the weighting of the criteria given by the decision-makers. Although effective in the context of numerical data, this method still relies on subjectivity in weighting (Ginting et al., 2024). Research by Sutrisno (2025) developed TOPSIS in the selection of the best employees, with a distance-based approach to the ideal solution. This method works well for numerical data, but it has limitations in terms of data flexibility and reliance on subjective weighting (Sutrisno & Nugrahadi, 2025). Research by Maitasari (2024) applies MAUT (Multi-Attribute Utility Theory) which measures preferences based on utility functions, but this method requires the conversion of data to utility scales that require precise definition and high complexity (Bella Maitasari & Ahmad Farisi, 2024). On the other hand, Research by Wijaya (2024) applies Fuzzy SAW, which overcomes uncertainty in assessment by converting linguistic data into fuzzy forms, although it still relies on subjective weights and requires a defuzzification process that can introduce ambiguity in the results. In contrast to these methods, this study proposes the use of a combination of RAM-MEREK that provides a more objective and adaptive approach to ordinal data, reduces dependence on subjectivity and provides more transparent results in the selection of the best employees (Wijaya & Farisi, 2024). Although various DSS methods such as WASPAS, TOPSIS, MAUT, and Fuzzy SAW have been widely applied in the selection of the best employees, most still rely on subjectivity in determining the weight of criteria that can affect the accuracy of evaluation results. In addition, these methods are often focused on numerical data or linguistic data, making them less flexible in handling ordinal data that is often found in employee assessments. Therefore, there is still a need to develop a more objective and adaptive approach, in the research conducted by RAM-MEREK is able to reduce dependence on subjectivity and provide more transparent results in decision-making based on ordinal data.

The combined approach of RAM-MEREK is an innovative and effective strategy to increase objectivity and accuracy in the multi-criteria decision-making process, especially in the context of evaluation and selection of the best candidates in the selection of interns. This combination leverages the advantages of two complementary objective approaches, namely MEREK to assess the functional contribution of each criterion and RAM to capture the intensity of the absolute value or strength of each alternative. This combined approach provides flexibility, depth of analysis, and resilience to bias, making it ideal for complex decision support systems, such as the selection of the best interns. With RAM-MEREK, decision-makers can get a more comprehensive, and fair picture of determining the weight of the criteria, as well as produce a final ranking that is more mathematically and logically accountable. No previous study has specifically combined the RAM rating method with the MEREK objective weighting technique in the context of

multicriteria decision-making. This gap indicates a significant research gap to develop new and more accurate and objective approaches to alternative assessment.

This study aims to develop and propose a combined approach of RAM and MEREC as an objective weighting framework that is able to improve accuracy and fairness in the multicriteria decision-making process, especially in the context of evaluation and selection of the best interns. The main contribution of this study lies in the integration of two complementary objective methods, namely RAM which measures the intensity of alternative values quantitatively and MEREC which assesses the influence of criteria in producing a more representative, stable, and free criterion weight from subjective bias. This combined approach is expected to enrich the literature in the field of decision support systems and provide practical and systematic solutions for organizations in evaluating candidates in a fair and transparent manner.

2. RESEARCH METHODOLOGY

2.1 Research Stages

The research stage is a series of systematic steps taken to gain knowledge or solve problems scientifically (Megawaty et al., 2024). This stage includes a process that starts from problem identification to solution of existing problems. Each stage is designed to ensure that the research is conducted in a structured, logical, and accountable manner, so that the results obtained have high validity and reliability. This research stage applies in various types of approaches, both qualitative and quantitative, and is an important foundation in the implementation of a scientific study (Hadad et al., 2025; Rahmanto et al., 2025). The inner stages show that research is not a disconnected activity, but part of a continuous process in the search and development of knowledge. Therefore, thoroughness, consistency, and research ethics are important elements that must be maintained throughout all stages of research. The stages of the research conducted are shown in figure 1.

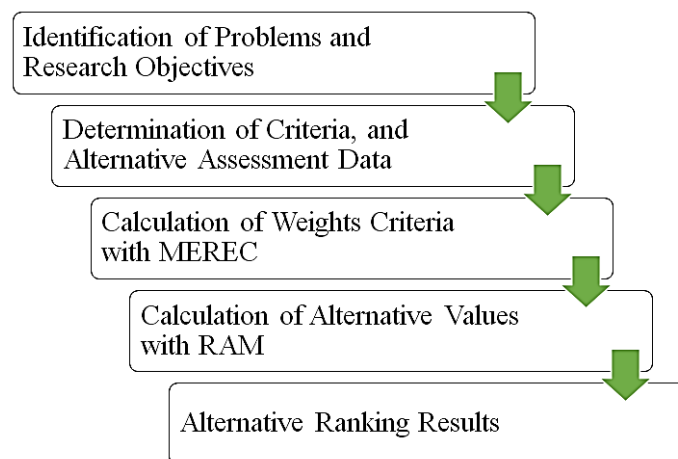


Figure 1. Research Stages

The stages of research in figure 1 start from the importance of objectivity in the evaluation of interns and the challenges in determining the weight of assessment criteria in a fair and rational manner. The research objectives are focused on the development of a combined RAM-MEREC method to produce accurate criterion weights and reliable alternative ratings. The next stage determines the criteria for evaluating the performance of interns based on organizational needs. The alternatives that are assessed are the names of the interns to be compared. The next stage is to calculate the weight of the criteria using the MEREC, a process that generally involves evaluating how the elimination of each criterion affects the overall alternative ranking. The basic idea is that the greater the criteria affect the alternative ranking, the higher the weight. The next step is to calculate the alternative values using the RAM, we need to follow a systematic procedure that combines root mean square (RMS) or quadratic mean to derive the weights for each criterion and then apply them to the evaluation of alternatives. RAM is based on the principle that the weight of each criterion is proportional to the square root of the mean of squared scores across alternatives. The final stage of making these ranking results combines the weight of the criteria (which indicates the importance of each criterion in the decision) and the value of the alternatives (which shows how well each alternative meets those criteria).

2.2 Method based on Removal Effects of Criteria (MEREC)

Method based on the removal effects of criteria is one of the objective weighting methods in the MCDM, this method is used to determine the weight of each criterion based on how much influence or contribution each criterion has on the overall assessment system. The advantages of MEREC do not require input from decision-makers in the form of preferences or opinions. The weight of the criteria is calculated automatically from the data, thus avoiding subjective



bias. This method is able to measure how much influence each criterion has on the final decision, based on the impact of its removal, not just whether or not it is an important assumption.

The first process in MEREC, namely creating a decision matrix, is a systematic table that presents the value or score of a number of alternatives to a certain number of criteria in the decision-making process made using the following equation.

$$X = \begin{bmatrix} x_{11} & \dots & x_{m1} \\ \vdots & \ddots & \vdots \\ x_{1n} & \dots & x_{mn} \end{bmatrix} \tag{1}$$

The second process in MEREC is that this normalization equalizes the rating scale (usually changed to a range between 0 to 1), depending on whether the criteria are getting bigger, the better or the smaller, the better, which is created using the following equation.

$$n_{ij} = \begin{cases} \frac{\min x_{kj}}{x_{ij}} & (\text{for beneficial criteria}) \\ \frac{x_{ij}}{\max x_{kj}} & (\text{for non - beneficial criteria}) \end{cases} \tag{2}$$

The third process in MEREC is to calculate the value of the aggregation function by adding up all the value of the assessment owned by one alternative, then averaged. The result is an overview of how well each alternative performs, if all criteria are considered equally important calculated using the following equation.

$$S_i = \ln \left(1 + \left(\frac{1}{m} \sum |\ln(n_{ij})| \right) \right) \tag{3}$$

The fourth process in MEREC is calculating removing criteria in turn to find out how important a criterion is, we remove one criterion from the assessment system. Then we recalculate the scores of all alternatives without these criteria. This process is done alternately for each criterion, one at a time calculated using the following equation.

$$S'_{ij} = \ln \left(1 + \left(\frac{1}{m} \sum_{k, k \neq j} |\ln(n_{ij})| \right) \right) \tag{4}$$

The fifth process in MEREC is calculating the total deviation to see how much the alternative score changes compared to the original score. If the change in value is very large when one criterion is removed, it means that the criterion has a big effect. On the other hand, if it doesn't change much, then the criteria are less important which is calculated using the following equation.

$$E_j = \sum |S'_{ij} - S_i| \tag{5}$$

The final process in MEREC is to calculate the criterion weight from the results of the criterion changes that have the greatest effect. Criteria with a large influence will be given a higher weight, the weight of the criteria is calculated using the following equation.

$$w_j = \frac{E_j}{\sum_k E_k} \tag{6}$$

The MEREC is used to determine the weight of the criteria based on the impact of their elimination on the final result. By analyzing how much the alternative score changes when one criterion is removed, MEREC is able to measure the actual contribution of each criterion without subjective intervention.

2.3 Root Assessment Method (RAM)

Root assessment method (RAM) is an approach in multi-criteria decision making that is used to evaluate and rank various alternatives based on a number of predetermined criteria. RAM is usually used when decision-making has to consider many factors that are interrelated and have different weights. RAM works on the principle of assessing the proximity or deviation of each alternative to the ideal solution and the ideal negative solution based on the specified criteria. RAM uses a normalized, weighted decision matrix to assess which alternatives are closest to ideal conditions.

The first process in RAM, namely creating a decision matrix, is a systematic table that presents the value or score of a number of alternatives to a certain number of criteria in the decision-making process made using (1).

The second process in RAM calculates the normalization of the decision matrix to convert the data into a comparable scale so that the criteria of different scales can be fairly compared are calculated using the following equation.

$$n_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}} \tag{7}$$

The third process in RAM calculates the multiplication of weights that exert an influence or level of importance on each criterion on the final result calculated using the following equation.

$$k_{ij} = n_{ij} * w_i \tag{8}$$



The fourth process in RAM calculates the total normalization score which sums the normalization weight values of all criteria for each alternative calculated using the following equation.

$$S_{+i} = \sum_{j=1}^n k_{+ij} \quad (9)$$

$$S_{-i} = \sum_{j=1}^n k_{-ij} \quad (10)$$

The fifth process in RAM calculates the final value of the alternative which is the total sum of the values of each alternative based on all the considered criteria calculated using the following equation.

$$RI_i = \frac{2+S_{-i}}{\sqrt{2+S_{+i}}} \quad (11)$$

RAM is a multicriteria decision-making method used to evaluate a number of alternatives based on several criteria with a certain weight. RAM provides a systematic way to assess and compare alternatives to make decisions more objective, measurable, and transparent.

2.4 Research Object

The object of research in this study is the selection of the best interns conducted in companies engaged in the information technology industry. This selection involves 12 interns who have undergone a six-month internship program in various divisions. The assessment is conducted by supervisors and their colleagues who have interacted directly during the internship program, which then becomes the basis for weighting and determining the ranking of the best interns. The method used to select the best intern is DSS which integrates a multi-criteria approach, with the aim of obtaining objective and bias-free results. The criteria used in this selection include discipline, technical ability, communication, teamwork, and absence. The data collected from the results of the evaluation will be analyzed using the RAM-MEREC method to produce the ranking of interns who best meet the predetermined criteria. Through this research, it is hoped that clearer insights can be obtained about the most decisive factors in choosing the best intern employees who can potentially become permanent employees in the company.

3. RESULTS AND DISCUSSION

RAM-MEREC is a combined approach in the MCDM method that integrates two main techniques, namely RAM for alternative rating and MEREC for objective determination of criterion weights. In the selection of the best interns, this method works synergistically to provide accurate and fair evaluation results. MEREC is used first to calculate the weight of criteria based on data sensitivity, weighted based on how much of an effect the removal of a criterion has on the overall performance of the system. Once the weighting of the criteria is obtained, the RAM method is used to evaluate and rank each alternative (prospective intern) taking into account the weighted criteria. RAM performs the process of normalization, weight multiplication, and value summation to produce the final score of each alternative. This approach is very effective because it combines objective assessment (via MEREC) and structured ranking (via RAM), so that it can assist decision-makers in selecting the best internship candidates based on valid and measurable data.

The RAM-MEREC approach has the main advantage of reducing subjectivity in the decision-making process, which is often a challenge in human-based evaluation systems. With MEREC, the weight of criteria such as technical skills, communication skills, discipline, and work attitude can be objectively determined based on their respective contribution to the final result. This ensures that the most influential criteria get more weight, and vice versa. Once the weights are obtained, RAM takes a role in assessing each prospective intern based on these criteria. Each candidate's performance values will be normalized and multiplied by their respective weights, resulting in a final score that can be directly compared. The results of this ranking then become a strong basis for companies or institutions in determining who deserves to be chosen as the best intern. By combining the accuracy of objective calculations and a transparent evaluation system, RAM-MEREC can improve the quality of decisions and provide greater confidence in the results of the selection.

3.1 Identification of Problems and Research Objectives

Selecting the best interns is a significant challenge in the workforce, especially when companies want to identify candidates who have the potential to be hired permanently in the future. However, the appraisal process often faces several problems, namely.

- Subjectivity in Appraisal: Many companies still rely on the personal opinions of supervisors or managers without using a structured and objective appraisal system, which risks creating bias.
- Unclear Assessment Criteria: Not all organizations have well-defined performance indicators to evaluate interns, such as communication skills, discipline, teamwork, and task completion.
- Assessment Imbalance Between Criteria: Some criteria are often considered more important without a clear basis, which can affect the accuracy of the selection process.
- Absence of Decision Support System (DSS): The lack of application of quantitative methods or DSS causes the selection process to be less systematic and time-consuming.



Based on the above problems, this research has several main objectives that are to be achieved in overcoming problems in the selection of interns, namely.

- a. Identify key criteria in the evaluation of the best interns, such as technical skills, work ethic, teamwork, creativity, and timeliness in completing tasks.
- b. Develop a DSS model that can assist management in selecting the best intern employees in an objective and structured manner.
- c. Apply multi-criteria decision-making methods i.e. RAM and MEREC to obtain the final ranking of the internship candidates.
- d. Improve accuracy and efficiency in the selection process, so that companies can select interns who best suit the needs and culture of the organization.

3.2 Determination of Criteria, and Alternative Assessment Data

Determining criteria is an important step in the multi-criteria decision-making process, as these criteria are the basis for assessing and comparing the performance of each candidate. In the context of selecting the best interns, the criteria used must reflect the quality, work ethic, and professional potential of the candidates. As a result of a literature study and consultation with management, the following criteria were determined as the basis for evaluation:

- a. Discipline (K1) is a benefit criterion: The level of punctuality and compliance with work rules.
- b. Technical Ability (K2) is a benefit criterion: Ability to complete tasks in accordance with the field of work of the internship.
- c. Communication (K3) is a benefit criterion: The ability to convey ideas clearly, as well as interact effectively with colleagues and superiors.
- d. Teamwork (K4) is a benefit criterion: Ability to collaborate, support, and contribute in a work team.
- e. Absence (K5) is a cost criterion: The amount of time or frequency that an intern is absent from a scheduled work or training activity.

These criteria can be categorized as a combination of soft skills and hard skills, both of which are important to support productivity and contribution during the internship period.

An alternative in this study is interns who are or have completed an internship at the company. Each alternative will be assessed based on five predetermined criteria, with data obtained through a direct supervisor assessment of each candidate. Table 1 is the data from the assessment of interns.

Table 1. Internship employee assessment data

Alternative Name	K1	K2	K3	K4	K5
Alternative 1	8	7	9	8	7
Alternative 2	7	8	8	7	9
Alternative 3	9	9	8	9	8
Alternative 4	6	7	7	6	7
Alternative 5	8	6	9	8	6
Alternative 6	9	8	9	9	8
Alternative 7	7	7	6	7	7
Alternative 8	8	8	8	8	9
Alternative 9	6	9	7	7	8
Alternative 10	9	9	9	9	9
Alternative 11	7	8	7	8	7
Alternative 12	8	7	8	9	6

The data used in this study was obtained from the company's internal assessment of intern employees who have undergone an internship program for 3 months. The assessment is carried out by a direct supervisor or field supervisor of each intern, using a performance evaluation form that has been standardized by the Human Resources (HR) division.

3.3 Calculation of Weights Criteria with MEREC

MEREC is an objective approach in calculating the weight of criteria by considering the effect of the elimination of a criterion on the total performance of the alternative. The greater the impact of the elimination of a criterion on the alternative end-value, the more important it will be, and the higher the weight.

The first process in MEREC is to create a decision matrix that presents the value or score of a number of alternatives to a number of criteria made based on the assessment data in table 2 using (1).



$$X = \begin{bmatrix} 8 & 7 & 9 & 8 & 7 \\ 7 & 8 & 8 & 7 & 9 \\ 9 & 9 & 8 & 9 & 8 \\ 6 & 7 & 7 & 6 & 7 \\ 8 & 6 & 9 & 8 & 6 \\ 9 & 8 & 9 & 9 & 8 \\ 7 & 7 & 6 & 7 & 7 \\ 8 & 8 & 8 & 8 & 9 \\ 6 & 9 & 7 & 7 & 8 \\ 9 & 9 & 9 & 9 & 9 \\ 7 & 8 & 7 & 8 & 7 \\ 8 & 7 & 8 & 9 & 6 \end{bmatrix}$$

The second process in MEREC is to calculate normalization values to equalize the assessment scale with a uniform range, normalization values are calculated using (2).

$$n_{11} = \frac{\min x_1}{x_{11}} = \frac{6}{8} = 0.75$$

The overall results of the normalization value calculation in the MEREC method of each alternative for all criteria are shown in table 2.

Table 2. The overall results of the normalization value

Alternative Name	K1	K2	K3	K4	K5
Alternative 1	0.75	0.86	0.67	0.75	0.86
Alternative 2	0.86	0.75	0.75	0.86	0.67
Alternative 3	0.67	0.67	0.75	0.67	0.75
Alternative 4	1.00	0.86	0.86	1.00	0.86
Alternative 5	0.75	1.00	0.67	0.75	1.00
Alternative 6	0.67	0.75	0.67	0.67	0.75
Alternative 7	0.86	0.86	1.00	0.86	0.86
Alternative 8	0.75	0.75	0.75	0.75	0.67
Alternative 9	1.00	0.67	0.86	0.86	0.75
Alternative 10	0.67	0.67	0.67	0.67	0.67
Alternative 11	0.86	0.75	0.86	0.75	0.86
Alternative 12	0.75	0.86	0.75	0.67	1.00

The third process in MEREC is to calculate the value of the aggregation function by summing all the value of the assessment owned by all the alternatives in each criterion calculated using (3).

$$S_1 = \ln \left(1 + \left(\frac{1}{12} \sum |\ln(n_{11,112})| \right) \right) = \ln \left(1 + \left(\frac{1}{12} (2.8296) \right) \right) = \ln(1 + (0.2358)) = \ln(1.2358) = 0.2117$$

$$S_2 = \ln \left(1 + \left(\frac{1}{12} \sum |\ln(n_{21,212})| \right) \right) = \ln \left(1 + \left(\frac{1}{12} (2.9837) \right) \right) = \ln(1 + (0.2486)) = \ln(1.2486) = 0.2221$$

$$S_3 = \ln \left(1 + \left(\frac{1}{12} \sum |\ln(n_{31,312})| \right) \right) = \ln \left(1 + \left(\frac{1}{12} (3.2350) \right) \right) = \ln(1 + (0.2696)) = \ln(1.2696) = 0.2387$$

$$S_4 = \ln \left(1 + \left(\frac{1}{12} \sum |\ln(n_{41,412})| \right) \right) = \ln \left(1 + \left(\frac{1}{12} (3.2350) \right) \right) = \ln(1 + (0.2696)) = \ln(1.2696) = 0.2387$$

$$S_5 = \ln \left(1 + \left(\frac{1}{12} \sum |\ln(n_{51,512})| \right) \right) = \ln \left(1 + \left(\frac{1}{12} (2.6960) \right) \right) = \ln(1 + (0.2247)) = \ln(1.2247) = 0.2027$$

The fourth process in MEREC is to calculate criteria with eliminated effects, to find out how important a criterion is with the effect of removing one criterion from the scoring system calculated using (4).

$$S'_{11} = \ln \left(1 + \left(\frac{1}{5} \sum_{k,k \neq j} |\ln(n_{21,51})| \right) \right) = \ln \left(1 + \left(\frac{1}{5} (1.001) \right) \right) = \ln(1 + (0.2003)) = \ln(1.2003) = 0.1826$$

The overall results of the calculation of alternative values with the effect of removing one criterion from the scoring system are shown in table 3.

Table 3. The overall result of the calculation of alternative values with removal effect

Alternative Name	K1	K2	K3	K4	K5
Alternative 1	0.1826	0.2046	0.1627	0.1826	0.2046
Alternative 2	0.2046	0.1826	0.1826	0.2046	0.1627
Alternative 3	0.2447	0.2447	0.2630	0.2447	0.2630



Alternative Name	K1	K2	K3	K4	K5
Alternative 4	0.0885	0.0598	0.0598	0.0885	0.0598
Alternative 5	0.1298	0.1791	0.1089	0.1298	0.1791
Alternative 6	0.2447	0.2630	0.2447	0.2447	0.2630
Alternative 7	0.0885	0.0885	0.1163	0.0885	0.0885
Alternative 8	0.2261	0.2261	0.2261	0.2261	0.2071
Alternative 9	0.1826	0.1126	0.1565	0.1565	0.1334
Alternative 10	0.2809	0.2809	0.2809	0.2809	0.2809
Alternative 11	0.1627	0.1398	0.1627	0.1398	0.1627
Alternative 12	0.1565	0.1791	0.1565	0.1362	0.2046

The fifth process in MEREC is to calculate the total deviation to see how much the alternative score changes compared to the initial score calculated using (5).

$$E_1 = \sum |S'_{11,112} - S_1|$$

$$E_1 = 0.0292 + 0.0071 + 0.0330 + 0.1233 + 0.0819 + 0.0330 + 0.1233 + 0.0144 + 0.0292 + 0.0692 + 0.0490 + 0.0552 = 0.6476$$

$$E_2 = \sum |S'_{21,212} - S_2|$$

$$E_2 = 0.0175 + 0.0395 + 0.0227 + 0.1622 + 0.0429 + 0.0409 + 0.1336 + 0.0040 + 0.1094 + 0.0589 + 0.0823 + 0.0429 = 0.7569$$

$$E_3 = \sum |S'_{31,312} - S_3|$$

$$E_3 = 0.0759 + 0.0561 + 0.0243 + 0.1789 + 0.1298 + 0.0060 + 0.1224 + 0.0126 + 0.0821 + 0.0422 + 0.0759 + 0.0821 = 0.8885$$

$$E_4 = \sum |S'_{41,412} - S_4|$$

$$E_4 = 0.0561 + 0.0341 + 0.0060 + 0.1502 + 0.1089 + 0.0060 + 0.1502 + 0.0126 + 0.0821 + 0.0422 + 0.0989 + 0.1025 = 0.8500$$

$$E_5 = \sum |S'_{51,512} - S_5|$$

$$E_5 = 0.0019 + 0.0399 + 0.0603 + 0.1428 + 0.0236 + 0.0603 + 0.1142 + 0.0045 + 0.0692 + 0.0783 + 0.0399 + 0.0019 = 0.6369$$

The last process in MEREC is to calculate the weight of the criteria from the results of the change in criteria, the weight of the criteria is calculated using (6).

$$w_1 = \frac{E_1}{\sum_k E_{1,5}} = \frac{0.6476}{0.6476+0.7569+0.8885+0.8500+0.6369} = \frac{0.6476}{3.7799} = 0.1713$$

$$w_2 = \frac{E_2}{\sum_k E_{1,5}} = \frac{0.7569}{0.6476+0.7569+0.8885+0.8500+0.6369} = \frac{0.7569}{3.7799} = 0.2002$$

$$w_3 = \frac{E_3}{\sum_k E_{1,5}} = \frac{0.8885}{0.6476+0.7569+0.8885+0.8500+0.6369} = \frac{0.8885}{3.7799} = 0.2351$$

$$w_4 = \frac{E_4}{\sum_k E_{1,5}} = \frac{0.8500}{0.6476+0.7569+0.8885+0.8500+0.6369} = \frac{0.8500}{3.7799} = 0.2249$$

$$w_5 = \frac{E_5}{\sum_k E_{1,5}} = \frac{0.6369}{0.6476+0.7569+0.8885+0.8500+0.6369} = \frac{0.6369}{3.7799} = 0.1685$$

The results of the impemetation from MEREC, the weight produced does not depend on human subjective perception, but is entirely based on the actual influence of each criterion on the ranking results. This increases objectivity and reliability in the decision-making process.

3.4 Calculation of Alternative Values with RAM

RAM is one of the methods in MCDM that focuses the assessment process on calculating the proximity of each alternative to the ideal reference alternative. In the context of the selection of the best intern employees, RAM is used to evaluate and rank candidates based on a number of predetermined performance criteria. The application of the RAM method in calculating alternative values for the selection of the best interns based on a number of predetermined criteria. With the application of this method, it is hoped that the selection process can be carried out more objectively, transparently, and able to provide accountable results.

The first process in RAM, namely creating a decision matrix, is a systematic table that presents the value or score of a number of alternatives to a certain number of criteria in the decision-making process made using (1).



$$X = \begin{bmatrix} 8 & 7 & 9 & 8 & 7 \\ 7 & 8 & 8 & 7 & 9 \\ 9 & 9 & 8 & 9 & 8 \\ 6 & 7 & 7 & 6 & 7 \\ 8 & 6 & 9 & 8 & 6 \\ 9 & 8 & 9 & 9 & 8 \\ 7 & 7 & 6 & 7 & 7 \\ 8 & 8 & 8 & 8 & 9 \\ 6 & 9 & 7 & 7 & 8 \\ 9 & 9 & 9 & 9 & 9 \\ 7 & 8 & 7 & 8 & 7 \\ 8 & 7 & 8 & 9 & 6 \end{bmatrix}$$

The second process in RAM calculates the normalization of the decision matrix to convert the data into a scale comparable to using (7).

$$n_{11} = \frac{x_{11}}{\sum_{i=1}^n x_{i1,112}} = \frac{8}{8+7+9+6+8+9+7+8+6+9+7+8} = \frac{8}{92} = 0.087$$

The overall results of the normalization value calculation in the RAM of each alternative for all criteria are shown in table 4.

Table 4. The overall results of the normalization value

Alternative Name	K1	K2	K3	K4	K5
Alternative 1	0.087	0.075	0.095	0.084	0.077
Alternative 2	0.076	0.086	0.084	0.074	0.099
Alternative 3	0.098	0.097	0.084	0.095	0.088
Alternative 4	0.065	0.075	0.074	0.063	0.077
Alternative 5	0.087	0.065	0.095	0.084	0.066
Alternative 6	0.098	0.086	0.095	0.095	0.088
Alternative 7	0.076	0.075	0.063	0.074	0.077
Alternative 8	0.087	0.086	0.084	0.084	0.099
Alternative 9	0.065	0.097	0.074	0.074	0.088
Alternative 10	0.098	0.097	0.095	0.095	0.099
Alternative 11	0.076	0.086	0.074	0.084	0.077
Alternative 12	0.087	0.075	0.084	0.095	0.066

The third process in RAM calculates the multiplication of weights that exert any influence or level of importance on each alternative of the existing criteria using (8).

$$k_{11} = n_{11} * w_1 = 0.087 * 0.1713 = 0.0149$$

The overall results of the multiplication of weights calculation in the RAM of each alternative for all criteria are shown in table 5.

Table 5. The multiplication of weights calculation

Alternative Name	K1	K2	K3	K4	K5
Alternative 1	0.0149	0.0151	0.0223	0.0189	0.0130
Alternative 2	0.0130	0.0172	0.0198	0.0166	0.0167
Alternative 3	0.0168	0.0194	0.0198	0.0213	0.0148
Alternative 4	0.0112	0.0151	0.0173	0.0142	0.0130
Alternative 5	0.0149	0.0129	0.0223	0.0189	0.0111
Alternative 6	0.0168	0.0172	0.0223	0.0213	0.0148
Alternative 7	0.0130	0.0151	0.0148	0.0166	0.0130
Alternative 8	0.0149	0.0172	0.0198	0.0189	0.0167
Alternative 9	0.0112	0.0194	0.0173	0.0166	0.0148
Alternative 10	0.0168	0.0194	0.0223	0.0213	0.0167
Alternative 11	0.0130	0.0172	0.0173	0.0189	0.0130
Alternative 12	0.0149	0.0151	0.0198	0.0213	0.0111

The fourth process in RAM calculates the total normalization score of each of the criteria of benefit and cost calculated using (9) and (10).

$$S_{+1} = \sum_{i=1}^n k_{+11,41} = k_{11} + k_{21} + k_{31} + k_{41} = 0.0149 + 0.0151 + 0.0223 + 0.0189 = 0.0712$$

$$S_{-1} = \sum_{i=1}^n k_{-51} = k_{51} = 0.0130$$



The results of the calculation of the total normalization score of each alternative for each benefit and cost criteria are shown in table 6.

Table 6. The multiplication of weights calculation

Alternative Name	S_+	S_-
Alternative 1	0.0712	0.0130
Alternative 2	0.0666	0.0167
Alternative 3	0.0772	0.0148
Alternative 4	0.0578	0.0130
Alternative 5	0.0690	0.0111
Alternative 6	0.0776	0.0148
Alternative 7	0.0595	0.0130
Alternative 8	0.0709	0.0167
Alternative 9	0.0644	0.0148
Alternative 10	0.0797	0.0167
Alternative 11	0.0665	0.0130
Alternative 12	0.0711	0.0111

The fifth process in RAM calculates the final value of the alternative which is the sum of the total value of each alternative based on all the considered criteria calculated using (11).

$$RI_1 = \sqrt[2+S_+]{2 + S_+} = \sqrt[2+0.0130]{2 + 0.0712} = \sqrt[2.0130]{2.0712} = 1.4358$$

The results of the overall calculation of the total alternative score in the selection of the best interns are shown in table 7.

Table 7. The total alternative score

Alternative Name	Total Score
Alternative 1	1.4358
Alternative 2	1.4333
Alternative 3	1.4374
Alternative 4	1.4312
Alternative 5	1.4355
Alternative 6	1.4375
Alternative 7	1.4318
Alternative 8	1.4347
Alternative 9	1.4330
Alternative 10	1.4378
Alternative 11	1.4342
Alternative 12	1.4362

This study applies RAM as a multi-criteria decision-making method to assess and determine the best intern employees based on several predetermined criteria, such as communication skills, initiative, task completion, and absenteeism. Each alternative is objectively evaluated through the process of normalization, weighting, and calculation of the distance root to the ideal profile.

3.5 Alternative Ranking Results

The assessment of the best interns was carried out with a combination approach between MEREC as an objective weighting method and RAM as a distance calculation method to the ideal profile. MEREC is used to determine the weighting of criteria based on the sensitivity of deletion, resulting in weighting that is free from subjectivity. The weight values obtained are then used in the RAM process to calculate the proximity of each alternative to the best profile, the ranking results are shown in table 8.

Table 8. Alternative ranking results

Ranking	Alternative Name	Total Score
1	Alternative 10	1.4378
2	Alternative 6	1.4375
3	Alternative 3	1.4374
4	Alternative 12	1.4362
5	Alternative 1	1.4358
6	Alternative 5	1.4355
7	Alternative 8	1.4347
8	Alternative 11	1.4342



Ranking	Alternative Name	Total Score
9	Alternative 2	1.4333
10	Alternative 9	1.4330
11	Alternative 7	1.4318
12	Alternative 4	1.4312

The results of the calculation of the total score of all alternatives in the selection process of the best intern employees were obtained in order of rank from highest to lowest. Alternative 10 ranks first with the highest total score of 1.4378, followed by Alternative 6 with a score of 1.4375, and Alternative 3 in third place with a score of 1.4374. Furthermore, Alternative 12 and Alternative 1 are in fourth and fifth positions with scores of 1.4362 and 1.4358, respectively. The intermediate rankings are filled by Alternatives 5, Alternatives 8, and Alternatives 11 which have very close scores, namely 1.4355, 1.4347, and 1.4342. Meanwhile, Alternatives 2, Alternatives 9, Alternatives 7, and Alternatives 4 rank at the bottom with scores of 1.4333, 1.4330, 1.4318, and 1.4312, respectively. From the distribution of these scores, it can be seen that the difference in scores between the alternatives is relatively small, indicating that the candidates have a competitive performance and these results become a recommendation in the final decision making objectively.

3.6 Discussion

The results showed that the combination of the RAM and MEREC methods resulted in alternative rankings that were more stable, objective, and consistent compared to methods that used a single approach. RAM is used to manage rating-based preference data from multiple raters, while MEREC serves to objectively determine the weight of criteria based on the relative contribution of each criterion to the value of the decision. The integration of these two methods is able to synergize the power of the subjectivity of ranking aggregation with the objectivity of criterion assessment. This study proves that the combination of RAM and MEREC methods is able to produce adaptive and objective DSS in the selection of the best employees. The RAM approach manages preferences in the form of an aggregate ranking, while MEREC assigns criteria weights based on the impact of their elimination on the overall evaluation, resulting in fairer results and free from subjectivity.

Compared to Ginting (2024) who uses the WASPAS method, RAM-MEREC offers an advantage in terms of weighting objectivity. WASPAS, which combines WSM and WPM, is indeed able to handle numerical data well, but it still relies on subjective weight given by decision-makers. RAM-MEREC is superior when transparency is needed in weighting and when input data comes from an ordinal scale, such as the ranking of assessments between employees (Ginting et al., 2024). Meanwhile, in Sutrisno (2025) research using the TOPSIS method, the decision is based on the distance to the ideal positive and negative solutions (Sutrisno & Nugrahadi, 2025). Although TOPSIS is effective for both numerical and structured data, it is less flexible with ordinal preference data and still relies on subjective weighting. RAM-MEREC overcomes these limitations through the use of objectively derived ratings and weights from the data structure. Research from Maitasari (2024), with his approach using MAUT (Multi-Attribute Utility Theory), emphasizes the function of utility in measuring preferences for each alternative (Bella Maitasari & Ahmad Farisi, 2024). However, the complexity of building utility functions and the reliance on the accuracy of the criteria weights are challenges. RAM-MEREC is simpler in implementation, does not require explicit utility functions, and still maintains the rationality of the ranking results. Research from Wijaya (2024) applies the Fuzzy SAW method to overcome uncertainty in employee assessments. Fuzzy SAW converts linguistic data into fuzzy numbers and then calculates the final score with the SAW method (Wijaya & Farisi, 2024). However, this method still relies on subjective weight and requires a defuzzification process that sometimes creates ambiguity. RAM-MEREC not only avoids complex fuzzy processes, but is also more precise when data is presented as an explicit ranking without the need to convert it to a linguistic form.

Overall, the RAM-MEREC combination is very suitable to be applied in the context of HR assessment with ordinal preference data, as it not only simplifies the decision-making process, but also improves accuracy and objectivity through a systematic mathematical approach. The strength of this method lies in its flexibility in handling various forms of input and its ability to produce weights that are free from personal bias.

4. CONCLUSION

This study proposes a combined RAM-MEREC approach, which integrates MEREC for the determination of criterion weighting and RAM for alternative rating based on the effect of the elimination of certain criteria. MEREC is used to calculate the weight of criteria more objectively, taking into account the impact of the omission of each criterion on the overall evaluation. Meanwhile, RAM is used to evaluate alternative ratings based on the changes that occur if certain criteria are omitted. The results of the calculation of the total score of all alternatives using the evaluation method that has been determined, obtained that Alternative 10 is the best candidate with the highest score of 1.4378, followed by Alternative 6 with a score of 1.4375 and Alternative 3 with a score of 1.4375. These results show that Alternative 10 best meets the expected criteria in the selection of intern employees. The results of the study show that MEREC is effective in producing weighting criteria that are more in accordance with the level of importance of each criterion in the selection process, thereby strengthening the validity of the selection decision. On the other hand, RAM provides



more accurate and stable alternative ranking results by analyzing how changes in criteria weights can affect the internal final rankings. The RAM-MEREC approach is proven to be an efficient and transparent method in selecting the best interns. By combining the depth of weight analysis and the effect of criteria elimination, this method provides more objective decisions, reduces bias, and improves reliability in internal selection. This approach can be adapted to other selection processes in the organization to achieve more accurate and data-driven decisions.

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