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Integration of LOPCOW and ARAS Methods for Selecting the Best Employees in the Finance Division

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Abstract–This research is motivated by problems in the performance evaluation process of employees, which often still takes place subjectively and lacks a systematic calculation basis. This can lead to unfair assessments and the potential for incorrect decisions. To address these issues, this study employs a combination of the LOPCOW and ARAS methods as an approach in a multi-criteria decision support system. The combination of the LOPCOW and ARAS methods is necessary because they complement each other in producing a more objective and accurate decision-making process. LOPCOW plays a role in determining the criteria weights objectively based on the logarithmic variation of the data, and ARAS is used to evaluate and rank alternatives based on their proximity to the ideal condition. The LOPCOW method is used to objectively determine the weights of criteria based on relative importance, while the ARAS method is used to calculate the relative utility values of each alternative, thereby producing clear and measurable final rankings. The research results indicate that out of the six employee alternatives evaluated, Employee A2 ranked first with a score of 0.9879, followed by Employee A6 with a score of 0.982. These findings prove that the integration of the LOPCOW and ARAS methods can provide objective, accurate, and transparent results in ranking alternatives. Therefore, this approach can be relied upon as a solution to address issues of subjectivity and improve the quality of decision-making, particularly in a systematic and accountable evaluation of employee performance.

Keywords: Employee Performance; Multi-Criteria Decision Making (MCDM); LOPCOW Method; ARAS Method; Decision Support System

1. INTRODUCTION

The selection of the best employees in the finance division is very important to maintain accuracy in every recording and financial reporting process[1], [2]. This division serves as the center for managing the company's financial data, so even the smallest mistakes can have a significant impact on strategic decision-making and compliance with regulations. By selecting employees with outstanding performance, the company can ensure that every transaction is accurately recorded, financial reports are prepared correctly, and the risks of errors or fraud can be minimized. This not only supports the internal stability of the company but also enhances the trust of management and stakeholders. In addition to accuracy, selecting the best employees in the finance division also plays a crucial role in maintaining transparency and work effectiveness. Employees with high integrity and adequate competence are able to work according to procedures, adhere to accounting standards, and provide clear and accountable financial information. Maintained transparency will strengthen the company's credibility in the eyes of investors, regulators, and business partners. Meanwhile, work effectiveness can be enhanced through the contributions of employees who can manage resources efficiently, find solutions to financial problems, and support the creation of a solid internal control system. Thus, selecting the best employees becomes a strategic step to ensure the sustainability and development of the company.

The challenge in conducting objective employee performance evaluations lies in the potential bias of the evaluator, limitations of indicators, and differences in perceptions regarding performance standards. Often, evaluations are influenced by subjective factors such as personal closeness, individual perceptions of attitudes, or assessments based on the last impression (recency effect), making the results less reflective of the true abilities and contributions of the employees[2], [3]. Furthermore, many organizations still use indicators that are too general or only focus on final outcomes, without considering the work process, creativity, or non-technical contributions such as teamwork and initiative. Another challenge arises from external factors that affect employee performance but are not always controllable, such as market conditions, resource availability, or support from other divisions. This often creates a gap between individual achievements and the reality of the work situation. On the other hand, the use of traditional assessment methods that are less systematic can also lead to unfairness, especially if not supported by measurable data. Therefore, to achieve objectivity, companies need to develop a data-driven assessment system, using a combination of quantitative and qualitative indicators, and ensure transparency and consistency at every stage of the evaluation process.

The integration of the Logarithmic Percentage Change-Driven Objective Weighting (LOPCOW) method with Additive Ratio Assessment (ARAS) is highly relevant in the context of multi-criteria decision making, especially when objective weighting and comprehensive alternative evaluation are required. LOPCOW serves to calculate criterion weights objectively based on data variation through a logarithmic percentage change approach, thus assigning weights to each criterion according to their level of influence and information on the overall decision[4]–[6]. In this way, subjective bias in weight determination can be minimized, resulting in more accurate and fair weights. After the criteria weights are obtained from LOPCOW, the ARAS method is used to evaluate and

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rank alternatives based on the additive ratio principle[7], [8]. ARAS assesses alternatives by comparing the achievement ratio of each alternative against the ideal value, then aggregating them into a final score that indicates the level of preference. With this combination, the resulting decision becomes more rational because the criteria weights are determined objectively, while the evaluation process of alternatives is carried out with a straightforward, transparent approach that can accommodate direct comparisons among alternatives. The relevance of integrating these two methods lies in their ability to present a balanced assessment system between the accuracy of weighting and the clarity of ranking results, making it applicable in various fields such as human resource management, supplier selection, strategic decision making, and organizational performance evaluation.

The combination of LOPCOW and ARAS methods in decision support systems is designed to address weaknesses in determining weights and ranking alternatives. LOPCOW serves as an objective weighting method by considering logarithmic percentage changes among criteria, so the weights generated can fairly and consistently reflect the relative importance level[5], [8], [9]. These weights then become the main input for the ARAS method, which relies on calculating relative utility values to determine the ranking of each alternative[10], [11]. In this way, the integration of LOPCOW and ARAS provides a balance between objectivity in weighting and clarity in the evaluation process. This combined calculation process not only produces the best alternative sequence but also provides a deeper understanding of the relative positions of each alternative against the ideal solution. Alternatives with the highest utility values are considered the most aligned with decision criteria, while other alternatives can be evaluated based on their advantages and disadvantages. The strength of this combination lies in its ability to present results that are transparent, measurable, and easy to interpret by decision-makers. Therefore, the combined methods of LOPCOW and ARAS can be widely applied, whether in employee performance evaluation, supplier selection, or other strategic decision-making.

Research by Sinurat (2024) discusses the process for assessing and selecting the best employees, which has been proven to be less efficient and accurate. To address this issue, a web-based decision support system (DSS) was developed using the AHP method. AHP allows employee performance evaluation to be more objective and accurate based on various criteria, and this system is expected to increase employee motivation through more transparent assessments[12]. Research by Wijaya (2024) shows that this decision support system uses the Fuzzy SAW method, which is suitable for evaluating the best employees and can help companies conduct employee assessments more quickly and accurately[13]. Research by Maitasari (2024) states that the decision support system built using the multi-attribute utility theory decision support system based on black box testing has been tested in all test cases and provides results as expected[14]. Research by Ginting (2024) indicates that the Weight Aggregate Sum Product Assessment (WASPAS) method is one of the methods that can be used in decision-making involving multiple attributes or criteria for employee performance evaluation, which will serve as a basis for giving rewards to employees and can be considered a factor to provide motivation to employees[15]. The difference with research that combines LOPCOW and ARAS presents a more adaptive and accurate approach in employee performance assessment. The LOPCOW method provides an advantage in determining the weights of criteria objectively through the analysis of logarithmic percentage changes in data, thereby capturing significant variations among criteria without relying on the subjective perceptions of decision-makers. Meanwhile, ARAS is used to assess alternatives based on their proximity to the ideal condition, resulting in a more stable and rational ranking.

The purpose of this research is to integrate the LOPCOW method as an objective weighting technique and ARAS as an alternative evaluation method, to produce a more accurate, transparent, and fair assessment process. Through the use of LOPCOW, the weight of criteria is determined scientifically based on data variations without being influenced by the subjectivity of the assessors, while ARAS is used to rank the best alternatives by comparing each's level of achievement against ideal values. The results of this research present a systematic approach in supporting management in multi-criteria decision-making, whether in selecting the best employees, suppliers, or other strategic alternatives, thereby producing decisions that are more rational, accountable, and contribute to improving organizational performance.

2. RESEARCH METHODOLOGY

2.1 Research Stages

The stages of research can generally be understood as a structured workflow that helps researchers achieve their goals systematically and measurably[16], [17]. This process begins with the determination of the topic and formulation of the problem, followed by the preparation of a theoretical foundation as a conceptual basis. After that, the researcher designs the research, which includes methods, population and sample, data collection techniques, and the instruments used. The data obtained then undergoes processing and analysis stages, both qualitatively and quantitatively according to the research needs. The final stage involves compiling the results, discussion, and conclusions that are critically formulated to answer the research questions and provide recommendations for further research or practical applications. The stages of research carried out are presented in Figure 1.

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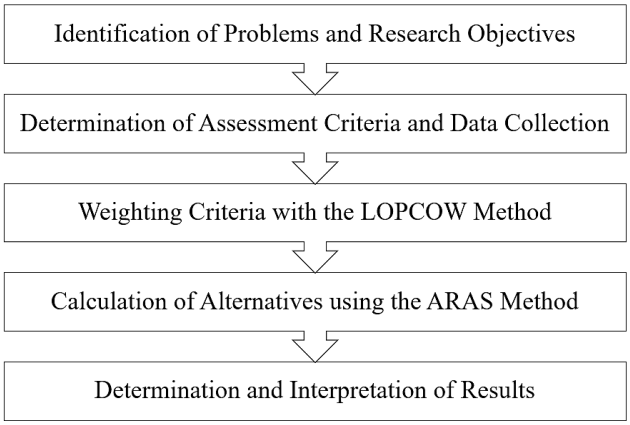

Figure 1. Research Stage

The research stages in Figure 1 for the initial stage, an identification of problems related to the difficulties of the company in conducting objective employee performance assessments in the finance division was carried out. The main objective of the research is to design a decision-making model by integrating the LOPCOW method for objective weighting and ARAS for selecting the best employee alternatives. Establishing the criteria used to assess the performance of employees in the finance division. For example: accuracy of financial reports, analytical skills, compliance with regulations, attention to detail, and teamwork. The criteria are established based on discussions with HRD, division leaders, and collecting data on the employees to be evaluated (alternatives) along with their scores on each criterion. Data can be obtained through performance assessment reports, manager interviews, and company documentation. Furthermore, the weights of the criteria are calculated objectively using the LOPCOW method, which utilizes logarithmic percentage changes, thus resulting in fair weights free from subjective bias. Employee alternatives are evaluated using the ARAS method with weights obtained from LOPCOW. The stages include normalizing the decision matrix, calculating utility values, and determining the final score for each employee. The alternative with the highest score is designated as the best employee in the finance division. The results of the research are analyzed to understand the contribution of the LOPCOW–ARAS integration method in generating objective decisions.

2.2 LOPCOW Weighting Method

The LOPCOW method is one of the objective weighting techniques in Multi-Criteria Decision Making (MCDM) designed to determine the weights of criteria fairly without being influenced by the subjectivity of decision-makers[18], [19]. The main principle of this method is to utilize the logarithmic percentage change of the criterion values in the decision matrix to assess the relative importance of each criterion.
The first stage in the LOPCOW method is to create a decision matrix, which is made using the following equation.

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

The decision matrix is arranged in the form of rows and columns. Each row in the decision matrix represents the available alternatives, while the columns represent the criteria used. The second stage in the LOPCOW method involves calculating the normalization of the matrix using the following equation.

$$n_{ij} = \frac{x_{ij}}{m+\sum_{i=1}^{m} {x_{ij}}^2} \quad (2)$$

The normalization of the matrix is calculated for each alternative based on all the existing criteria, where the symbol m represents the number of criteria for each existing alternative, while x_{ij} represents the value from the decision matrix. The third stage in the LOPCOW method is to calculate the preference value using the following equation.

$$PV_i = 100 * \left| \frac{\sqrt{\sum_{i=1}^{m} {n_{ij}}^2}}{\ln \frac{m}{\sigma_i}} \right| \quad (3)$$

The preference value is denoted by PV_i, while n_{ij} represents the value from the normalized matrix, m is the number of alternatives available, and σ_i it is the standard deviation value. The final stage in the LOPCOW method is to calculate the final weight of each criterion using the following equation.

$$w_j = \frac{PV_i}{\sum_{j=1}^{n} PV_i} \quad (4)$$

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The final weight value is symbolized by w_j. The results from LOPCOW are weights of criteria that are objective, consistent, and reflect the extent to which the criteria influence the differentiation of alternatives. The advantage of this method is its ability to reduce subjective bias, consider data variability, and produce weights that are more representative in multi-criteria decision making.

2.3 ARAS Method

The ARAS method is one of the methods in MCDM used to rank alternatives based on certain criteria. The main concept of this method is that the best alternative has a utility value that is closest to the ideal condition. In other words, ARAS assesses how well each alternative meets the established criteria and then provides a score that can be compared[20], [21].

The first stage in the ARAS method is to compile a decision matrix. This matrix includes all the alternatives that will be evaluated and the criteria used for assessment. Each cell in the matrix contains the value or score of the alternative on a specific criterion. The decision matrix is created using equation (1).
After the decision matrix is created, the next step is to perform normalization. Normalization aims to standardize the performance values of the alternatives so that they can be compared on the same scale. This is done by dividing each alternative value by the square root of the sum of squares of all values on that criterion. The normalization formula is as follows:

$$x_{ij} = \frac{1}{x_{ij}^*}; \qquad \overline{x_{ij}} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \tag{5}$$

where x_{ij} is the value of the decision matrix for each alternative based on the existing criteria. After normalization is done, the next step is to multiply the normalized values by the predetermined weights for each criterion. These weights reflect the level of importance of each criterion in the decision-making process. The preference value for each alternative is calculated using the formula:

$$d_{ij} = \overline{x_{ij}} * w_j \tag{6}$$

Where w_j is the weight value of the criteria, and d_{ij} is the result of multiplying the weight of the criteria by the normalization value. After calculating the preference values, the next step is to calculate the optimization value s_i. The optimization value indicates how well each alternative meets the established criteria compared to the ideal solution. This can be done by calculating the difference between the preference values of the alternatives and the highest preference value among all alternatives. In other words, the optimization value provides an overview of how close a particular alternative is to the best performance. This value can be used to identify which alternative has the most optimal performance.

$$s_i = \sum_{j=1}^{n} d_{ij} \tag{7}$$

The final stage is to calculate the final optimization value K_i. This value is obtained by summing the optimization values for each alternative, resulting in a final score for each alternative. The alternative with the highest score is considered the best choice based on the evaluation conducted. This final value provides a clear understanding of the ranking of alternatives, allowing decision-makers to make more informed decisions based on the analysis that has been performed.

$$K_i = \frac{s_i}{s_o} \tag{8}$$

The advantages of the ARAS method are its simple calculations, transparency, and results that are easy for decision-makers to understand. In addition, this method is capable of providing comparative values in the form of ratios that indicate the degree of proximity of alternatives to the ideal conditions.

3. RESULT AND DISCUSSION

The assessment of sales performance is one of the crucial aspects in supporting the success of a company, as the quality and effectiveness of sales personnel directly affect the achievement of business targets. However, this process often encounters obstacles in the form of subjective evaluations and the complexity of criteria that must be considered simultaneously. Therefore, a systematic approach is needed through a DSS based on MCDM methods. This study integrates Entropy as an objective weighting method that can assess the importance level of criteria based on data diversity, with WASPAS as an alternative ranking method to produce accurate and fair evaluations. This integration is expected to assist management in determining the best sales personnel in a more objective, transparent, and measurable manner.

The integration of the LOPCOW and ARAS methods has several advantages in supporting the selection of the best employees in the finance division. The LOPCOW method provides objective weighting of criteria by utilizing data variation, thus reducing the subjective bias that usually occurs in the assessment process. Furthermore, ARAS plays a role in clearly ranking alternatives through the calculation of relative utility values, making the final

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results easier to understand and compare. This process is also transparent, as each calculation stage, from weighting to final evaluation, can be systematically explained to management. Another advantage is flexibility, as LOPCOW-ARAS is not only relevant for employee assessment in the finance division but can also be applied in various other multi-criteria decision-making contexts.

3.1 Identification of Problems and Research Objectives

The identification of issues in this research focuses on the importance of the selection process for the best employees in the finance division, which often faces challenges related to objectivity, transparency, and accuracy of assessment. The finance division is a vital part of the company responsible for managing financial reports, budgeting, and compliance with accounting standards and regulations. Mistakes in selecting the best employees can lead to risks of recording errors, delays in reports, and a decrease in trust from management and stakeholders. Therefore, there is a need for an approach that can assess employee performance in a more measurable and unbiased manner. The purpose of this research is to develop a model for selecting the best employees in the finance division using a multi-criteria decision-making method based on objective data. Through this approach, each employee can be assessed based on relevant criteria such as attention to detail, integrity, work speed, analytical skills, and adherence to procedures. The results are expected to assist management in identifying employees who truly exhibit outstanding performance, while also creating a fair, transparent, and accountable evaluation system. Thus, the company can maintain the accuracy of financial reports, increase work effectiveness, and strengthen the culture of professionalism within the finance division.

3.2 Determination of Assessment Criteria and Data Collection

Determining the assessment criteria in selecting the best employees in the finance division is an important step to ensure that evaluations are conducted in a measurable and relevant manner. The chosen criteria must be able to reflect the core competencies required, both from technical and non-technical aspects. For example, accuracy in recording transactions, speed and accuracy in preparing reports, ability to analyze financial data, compliance with procedures and regulations, as well as integrity and responsibility in maintaining transparency. The establishment of these criteria is based on literature review, accounting standards, and input from management to ensure that the evaluation results meet the needs of the organization. After the criteria are determined, the next stage is the collection of data that serves as a basis for the assessment process. Data can be obtained from various sources, such as employee performance reports, attendance and work discipline records, internal audit results, direct supervisor evaluations, and summaries of work target achievements. The collected quantitative and qualitative data is then processed to allow for fair comparisons among employees. With a systematic data collection process in place, the company can ensure that the assessments carried out are objective, transparent, and capable of reflecting each employee's actual performance in the finance division. The assessment data for the selection of the best employees in the finance department is displayed in table 1.

Table 1. Assessment data for selection of the best employees in the finance department

Alternative	Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
Employee A1	85	78	80	90	88
Employee A2	90	82	85	88	92
Employee A3	75	85	78	84	86
Employee A4	88	80	82	86	90
Employee A5	82	76	79	85	87
Employee A6	87	84	83	89	91

The assessment data for employees in the finance division in Table 1 is organized based on five main criteria that reflect technical competencies and behaviors. The first criterion, Accuracy, measures the employees' precision in recording and processing financial data, which is crucial to avoid errors in financial reports. The second criterion, Speed & Precision, evaluates how efficiently employees can complete their tasks without compromising quality, highlighting their ability to manage deadlines under pressure. The third criterion, Analytical Skills, assesses the capacity of employees to interpret financial information, identify trends, and provide insights for decision-making. The fourth criterion, Compliance with Procedures, captures the employees' discipline in following organizational policies, accounting standards, and regulatory requirements, ensuring transparency and accountability. Finally, the fifth criterion, Integrity & Responsibility, emphasizes the importance of ethical behavior, honesty, and accountability in handling sensitive financial data. Together, these criteria provide a comprehensive framework to evaluate the best-performing employee in the finance division objectively and systematically.

3.3 Weighting Criteria with the LOPCOW Method

The weighting of criteria using the LOPCOW method is an objective approach used to determine the level of importance of each criterion in the decision-making process. This method utilizes logarithmic percentage changes of the normalized decision matrix values to calculate weights more fairly and proportionally. Thus, LOPCOW can illustrate the relative contribution of each criterion to the differences among alternatives, resulting in weights that

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are free from evaluator subjectivity. The main advantage of this method is its ability to balance sensitivity to data variations and stability of calculations, making the weighting results more accurate, consistent, and reliable in supporting the MCDM process.
The first stage in the LOPCOW method is to create a decision matrix, which is made using equation (1) based on the assessment data obtained from table 1.

$$X = \begin{bmatrix} 85 & 78 & 80 & 90 & 88 \\ 90 & 82 & 85 & 88 & 92 \\ 75 & 85 & 78 & 84 & 86 \\ 88 & 80 & 82 & 86 & 90 \\ 82 & 76 & 79 & 85 & 87 \\ 87 & 84 & 83 & 89 & 91 \end{bmatrix}$$

The second stage in the LOPCOW method carries out the normalization calculation of the matrix using equation (2) with the calculation results as follows.

$$n_{11} = \frac{85}{6+(x_{11}{}^2+x_{12}{}^2+x_{13}{}^2+x_{14}{}^2+x_{15}{}^2+x_{16}{}^2)}$$

$$n_{11} = \frac{85}{6+(85^2+90^2+75^2+88^2+82^2+87^2)}$$

$$n_{11} = \frac{85}{6+(42987)} = \frac{85}{42993} = 0.0020$$

The results of the normalization calculation using the LOPCOW method for all six alternatives with five criteria are shown in Table 2.

Table 2. Results of the normalization of the LOPCOW method

Alternative	Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
Employee A1	0.0020	0.0020	0.0020	0.0020	0.0019
Employee A2	0.0021	0.0021	0.0021	0.0019	0.0019
Employee A3	0.0017	0.0022	0.0020	0.0018	0.0018
Employee A4	0.0020	0.0020	0.0021	0.0019	0.0019
Employee A5	0.0019	0.0019	0.0020	0.0019	0.0018
Employee A6	0.0020	0.0021	0.0021	0.0020	0.0019

The third stage in the LOPCOW method is to calculate the preference values of each criterion using equation (3) with the calculated preference values of the criteria as follows.

$$PV_1 = 100 * \left| \frac{\sqrt{n_{11}{}^2+n_{12}{}^2+n_{13}{}^2+n_{14}{}^2+n_{15}{}^2+n_{16}{}^2}}{\ln\frac{6}{\sigma_1}} \right|$$

$$PV_1 = 100 * \left| \frac{\sqrt{0.0020^2+0.0021^2+0.0017^2+0.0020^2+0.0019^2+0.0020^2}}{\ln\frac{6}{0.00011454}} \right|$$

$$PV_1 = 100 * \left| \frac{0.004822484}{\ln 52383.33321} \right|$$

$$PV_1 = 100 * \left| \frac{0.004822484}{10.86634375} \right|$$

$$PV_1 = 100 * \left| \frac{0.004822484}{10.86634375} \right|$$

$$PV_1 = 0.0444$$

The results of the overall calculation of the criterion preference values using the LOPCOW method for five criteria are shown in Table 3.

Table 3. Results of the preference values of the LOPCOW method

Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
0.0444	0.0450	0.0437	0.0399	0.0389

The final stage in the LOPCOW method is to calculate the final weights of each criterion using equation (4) resulting from the weight calculation as follows.

$$w_1 = \frac{PV_1}{PV_1+PV_2+PV_3+PV_4+PV_5}$$

$$w_1 = \frac{0.0444}{0.0444+0.0450+0.0437+0.0399+0.0389}$$

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$w_1 = \frac{0.0444}{0.2119}$

$w_1 = 0.2094$

The results of the overall calculation of the final weights of each criterion using the LOPCOW method for five criteria are shown in Table 4.

Table 4. Results of the final weights of the LOPCOW method

Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
0.2094	0.2124	0.2063	0.1884	0.1835

The weighting results using the LOPCOW method show that each criterion receives a different weight according to its level of importance in the decision-making process. This approach can provide more objective results because it systematically considers the relative contributions among criteria. Thus, the resulting weights can serve as a strong foundation in the evaluation and ranking of alternatives, while also enhancing the validity of the decisions made.

3.4 Calculation of Alternatives using the ARAS Method

The ARAS method is one of the approaches in MADM used to assist decision-making with various criteria. In this method, calculations are made considering the importance level of each criterion determined through weights, followed by a normalization process so that the values of each alternative can be compared on an equal basis. The advantage of ARAS lies in its ability to evaluate alternatives based on the level of relative utility, so the final results can indicate the best alternative by comparing the closeness of its utility value to the optimal solution. The ARAS method provides simple yet comprehensive calculation steps to evaluate various options. The process of determining the best alternative begins with the preparation of the decision matrix, followed by normalization, calculation of weighted values, and determination of the optimal value. Thus, ARAS not only helps decision-makers obtain systematic and consistent results but also provides a clear picture of each alternative's position compared to others.
The first stage in the ARAS method is to construct the decision matrix. This matrix includes all the alternatives to be evaluated and the criteria used for assessment. Each cell in the matrix contains values or scores for the alternatives based on specific criteria. The decision matrix is created using equation (1) from the evaluation data in table 1.

$$X = \begin{bmatrix} 90 & 85 & 85 & 85 & 85 \\ 85 & 78 & 80 & 90 & 88 \\ 90 & 82 & 85 & 88 & 92 \\ 75 & 85 & 78 & 84 & 86 \\ 88 & 80 & 82 & 86 & 90 \\ 82 & 76 & 79 & 85 & 87 \\ 87 & 84 & 83 & 89 & 91 \end{bmatrix}$$

After the decision matrix is made, the next step is to perform normalization. Normalization aims to standardize the performance values of the alternatives so that they can be compared on the same scale using equation (6) calculated as follows.

$$\overline{x_{10}} = \frac{x_{10}}{x_{10}+x_{11}+x_{12}+x_{13}+x_{14}+x_{15}+x_{16}}$$

$$\overline{x_{10}} = \frac{90}{90+85+90+75+88+82+87}$$

$$\overline{x_{10}} = \frac{90}{597} = 0.1508$$

The results of the normalization calculation using the ARAS method for all six alternatives with five criteria are shown in Table 5.

Table 5. Results of the normalization of the ARAS method

Alternative	Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
	0.1508	0.1753	0.1745	0.1724	0.1723
Employee A1	0.1424	0.1608	0.1643	0.1724	0.1648
Employee A2	0.1508	0.1691	0.1745	0.1686	0.1723
Employee A3	0.1256	0.1753	0.1602	0.1609	0.1610
Employee A4	0.1474	0.1649	0.1684	0.1648	0.1685
Employee A5	0.1374	0.1567	0.1622	0.1628	0.1629
Employee A6	0.1457	0.1732	0.1704	0.1705	0.1704

After normalization is complete, the next step is to multiply the normalized values by the weights obtained from the LOPCOW method for each criterion calculated using equation (6).

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$d_{10} = \overline{x_{10}} * w_1 = 0.1508 * 0.2094 = 0.0316$

The results of the multiply the normalized values calculation using the ARAS method for all six alternatives with five criteria are shown in Table 6.

Table 6. Results of the multiply the normalized values of the ARAS method

Alternative	Accuracy	Speed & Precision	Analytical Skills	Compliance	Integrity
	0.0316	0.0372	0.0360	0.0325	0.0316
Employee A1	0.0298	0.0342	0.0339	0.0325	0.0302
Employee A2	0.0316	0.0359	0.0360	0.0318	0.0316
Employee A3	0.0263	0.0372	0.0330	0.0303	0.0296
Employee A4	0.0309	0.0350	0.0347	0.0310	0.0309
Employee A5	0.0288	0.0333	0.0335	0.0307	0.0299
Employee A6	0.0305	0.0368	0.0352	0.0321	0.0313

After calculating the preference values, the next step is to calculate the optimization values that indicate how well each alternative meets the established criteria compared to the ideal solution using equation (7), the results of the optimization value calculations are as follows.

$s_0 = d_{10} + d_{20} + d_{30} + d_{40} + d_{50}$

$s_0 = 0.0316 + 0.0372 + 0.0360 + 0.0325 + 0.0316$

$s_0 = 0.1689$

The results of the optimization values calculation using the ARAS method for all six alternatives with five criteria are shown in Table 7.

Table 7. Results of the optimization values of the ARAS method

Alternative	Optimazation Values
	0.1689
Employee A1	0.1606
Employee A2	0.1669
Employee A3	0.1564
Employee A4	0.1626
Employee A5	0.1561
Employee A6	0.1659

The final stage is to calculate the final optimization value obtained by summing the optimization values for each alternative, producing the final score for each alternative using equation (8), the results of the final optimization value calculation are as follows.

$K_1 = \frac{s_1}{s_0} = \frac{0.1606}{0.1689} = 0.9508$

The results of the optimization values calculation using the ARAS method for all six alternatives with five criteria are shown in Table 8.

Table 8. Results of the final optimization values of the ARAS method

Alternative	Final Optimazation Values
Employee A1	0.9508
Employee A2	0.9879
Employee A3	0.9263
Employee A4	0.9627
Employee A5	0.9241
Employee A6	0.9820

The results of the calculations using the ARAS method show that each alternative can be evaluated objectively based on its relative utility value compared to the optimal solution. The alternative with the highest utility value is declared the best choice because it has the closest proximity to the desired ideal condition. Thus, the ARAS method is able to provide clear, measurable, and consistent ranking results, serving as a strong foundation to support the multi-criteria decision-making process.

3.5 Determination and Interpretation of Results

The determination of results in multi-criteria decision-making methods becomes increasingly comprehensive when combining the LOPCOW and ARAS methods. LOPCOW plays a role in objectively determining the weights of

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criteria by considering the relative importance levels among the criteria, resulting in fair and consistent weights. Furthermore, the obtained weights are used in the ARAS calculations to evaluate each alternative more accurately. Thus, this combination provides a strong foundation in ranking development by integrating the reliability of weight determination and the clarity of relative utility value calculations. The interpretation of the results from the combination of LOPCOW and ARAS provides a clearer picture of each alternative's position relative to the ideal solution. Alternatives with the highest utility values indicate the best choices that are most aligned with the decision-making objectives, while other alternatives can be understood in terms of their strengths and weaknesses through comparative analysis. This approach not only yields a transparent ranking but also enhances accuracy and objectivity in decision-making. The combination of LOPCOW and ARAS is able to present results that are more convincing and can be relied upon as a basis for strategies in various application fields, the ranking results are displayed in the following image 2.

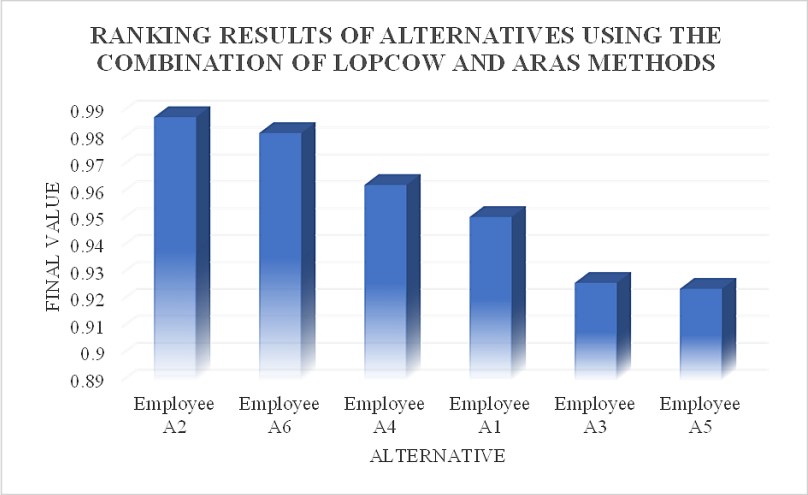

Figure 2. Alternative Ranking Results

The results of the calculations using the combination of the LOPCOW and ARAS methods displayed in the graph show that Employee A2 ranks first with a final score of 0.9879, making it the best alternative in the evaluation. The second position is held by Employee A6 with a score of 0.982, which also indicates very good performance. Next, Employee A4 is in third place with a score of 0.9627, followed by Employee A1 who obtained a score of 0.9508. Meanwhile, Employee A3 and Employee A5 occupy the lowest ranks with scores of 0.9263 and 0.9241 respectively. These results confirm that the combination of the LOPCOW and ARAS methods can provide an objective assessment, where the best alternatives can be clearly identified based on a comparison of the relative utility values among employees.

4. CONCLUSION

The evaluation results using the combination of the LOPCOW and ARAS methods show that this approach is effective in determining the best employees in an objective and measurable manner. Among the six alternatives analyzed, Employee A2 ranks highest with a final score of 0.9879. These findings demonstrate that the LOPCOW and ARAS combination can provide clear, accurate ranking results and can be used as a basis for decision-making in employee performance evaluation. This result also shows the important contribution of integrating the LOPCOW and ARAS methods in improving the quality of the decision support system. LOPCOW provides more objective criteria weights by considering the relative importance levels among criteria, while ARAS is capable of processing those weights to produce utility values that reflect the proximity of each alternative to the ideal condition. The combination of both not only simplifies the calculation process but also enhances the transparency and consistency of the evaluation results. Research findings from the combination of LOPCOW and ARAS methods indicate that this approach is capable of producing a more objective, efficient, and accurate assessment process in determining the best employees. The integration of these two methods strengthens the validity of results by minimizing subjectivity in determining criteria weights and provides stable ranking outcomes against changes in evaluation scores. Furthermore, this system can serve as an effective tool for management in conducting performance evaluations in a transparent and measurable manner. For future research, it is recommended that the LOPCOW–ARAS combination be tested in other decision-making contexts, such as supplier selection, project evaluation, or business strategy selection, involving more criteria and alternatives to examine the consistency and flexibility of this method in various decision-making scenarios.

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