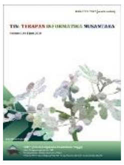


TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

Combination of Objective Weighting Method using MEREC and A New Additive Ratio Assessment in Coffee Barista Admissions

Muhammad Waqas Arshad[1], Ryan Randy Suryono[2], Yuri Rahmanto[3], Sumanto[4], Sanriomi Sintaro[5], Setiawansyah[6,*]

[1] Department of Computer Science and Engineering, University of Bologna, Bologna, Italy
[2] Faculty Engineering and Computer Science, Information System, Universitas Teknokrat Indonesia, Bandarlampung, Indonesia
[3] Faculty Engineering and Computer Science, Computer Engineering, Universitas Teknokrat Indonesia, Bandarlampung, Indonesia
[4] Faculty of Engineering and Informatics, Computer Science, Universitas Bina Sarana Informatika, Jakarta, Indonesia
[5] Faculty of Mathematics and Natural Sciences, Information System, Universitas Sam Ratulangi, Manado, Indonesa
[6] Faculty Engineering and Computer Science, Informatics, Universitas Teknokrat Indonesia, Bandarlampung, Indonesia
Email: [1]muhammad.waqas.arshad.1@gmail.com, [2]ryan@teknokrat.ac.id, [3]yurirahmanto@teknokrat.ac.id, [4]sumanto@bsi.ac.id, [5]sanriomi@unsrat.ac.id, [6,*]setiawansyah@teknokrat.ac.id
Correspondence Author Email: setiawansyah@teknokrat.ac.id

Abstract−A coffee barista is a professional who is skilled in the art of brewing and serving coffee in an attractive and high-quality way. The role of a barista is not only limited to operating an espresso machine and grinding coffee beans, but also includes in-depth knowledge of different types of coffee beans, manufacturing techniques, and the resulting flavors. The main problem in the acceptance of coffee baristas often has to do with the gap between industry expectations and the skills possessed by prospective workers. Many candidates may lack formal training or practical experience in brewing coffee, so they do not meet the standards expected by cafes or restaurants. The purpose of the research on the Combination of Objective Weighting Methods using MEREC and ARAS in Coffee Barista Admission is to develop and apply a more systematic and objective approach in the selection process of prospective baristas. The combination of objective weighting methods and the new additive ratio assessment (ARAS) approach offers a sophisticated framework for evaluating candidates in coffee barista admissions. The objective weighting method ensures that evaluation criteria are prioritized based on their intrinsic importance, thereby minimizing subjective preference. When combined with the ARAS method, which ranks alternatives based on their performance ratio to the ideal solution, this approach provides a balanced and comprehensive assessment for each candidate. Based on the results of the evaluation of the barista admission selection, Clara Dewi ranked first with the highest final score of 0.98553, followed by Hanafi Lestari with a score of 0.95921 and Erika Santosa with a score of 0.95726 who ranked second and third.

Keywords: ARAS; Barista; Combination; Objective Weighting Methods; Selection

1. INTRODUCTION

A coffee barista is a professional who is skilled in the art of brewing and serving coffee in an attractive and high-quality way. The role of a barista is not only limited to operating an espresso machine and grinding coffee beans, but also includes in-depth knowledge of different types of coffee beans, manufacturing techniques, and the resulting flavors. In the ever-growing café industry, baristas are often the main faces interacting with customers, ensuring that every cup of coffee is served perfectly(Aldisa, 2023; Sintaro, 2023). They also play a role in creating a fun and welcoming atmosphere in coffee shops, providing an experience that goes beyond just enjoying a drink. With their skills and dedication, baristas make an important contribution in introducing and popularizing coffee culture in different parts of the world. The acceptance of coffee baristas is an important selection process in the hospitality and café industry, where candidates are judged based on their skills, knowledge, and personality in serving high-quality coffee. This process typically involves an evaluation of technical abilities in operating coffee equipment, an understanding of the different types of coffee beans and brewing methods, and the ability to interact with customers in a friendly and professional manner. Prospective baristas are expected to have a passion for learning and adapting to the ever-evolving coffee trends, as well as being able to work in a dynamic and often busy environment. Accepting the right barista can improve the quality of service and customer satisfaction, making coffee shops a more attractive and popular place among coffee connoisseurs. The main problem in the acceptance of coffee baristas often has to do with the gap between industry expectations and the skills possessed by prospective workers. Many candidates may lack formal training or practical experience in brewing coffee, so they do not meet the standards expected by cafes or restaurants. In addition, the lack of understanding of the latest coffee trends and innovations in brewing techniques is also a challenge in finding competent baristas. An improper selection process can lead to a high turnover rate, which ultimately affects service quality and customer satisfaction. Therefore, it is important for employers to develop an effective recruitment and training process to ensure that incoming baristas not only have technical skills, but also interpersonal skills and commitment to their profession. One of the solutions in facing the challenges in accepting coffee baristas, the application of the decision support system (DSS) approach can be an effective solution.

DSS can assist managers in the selection process by providing objective and systematic analysis tools to evaluate candidates based on various criteria, such as technical skills, work experience, and interpersonal abilities(Panigrahi et al., 2021; Siciliani et al., 2023; Tešić et al., 2022). By using a data-driven model, DSS allows employers to make more informed and accurate decisions(Putra et al., 2024; Syahputra et al., 2024), reducing subjectivity and personal preferences in the recruitment process. Additionally, DSS can be integrated with the latest technology to provide insight into industry trends and training needs, ensuring that selected baristas are prepared to face the dynamic demands of the

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

job. The implementation of DSS in barista admissions not only improves the efficiency of the selection process, but also has the potential to improve service quality and customer satisfaction. The use of DSS in the coffee barista acceptance process offers a variety of significant advantages. DSS improves accuracy and objectivity in candidate assessment by providing comprehensive data-driven analysis. This reduces the possibility of subjectivity, ensuring that decisions are based on clear and measurable criteria. DSS can speed up the selection process by automating many stages of evaluation, saving managers valuable time and resources. The system can adapt to changing industry trends, ensuring that the selection criteria are always relevant and up-to-date. Additionally, DSS allows for tracking and analysis of previous recruitment results, providing insights for continuous improvement in admissions strategies. One of the methods in DSS is A New Additive Ratio Assessment.

A New Additive Ratio Assessment (ARAS) is an approach introduced to address a wide range of challenges in multi-criteria evaluations(Baraily et al., 2023; Bošković et al., 2023; Rong et al., 2024). This method combines the concept of ratio assessment with additive techniques to provide a more comprehensive framework for decision-making. The ARAS method aims to provide a more accurate and objective assessment by considering the weight and importance of each criterion in a more balanced manner. This becomes especially useful in situations where decision-makers have to evaluate alternatives based on a number of competing criteria. By offering a more flexible and adaptive approach, ARAS enables more in-depth and thorough analysis, resulting in more precise and efficient decisions. This method is an important tool in various fields, including project management, performance evaluation, and business strategy selection. ARAS can overcome problems arising from conflicting criteria, by combining ratio assessment and additive techniques, resulting in more objective and measurable decisions. The use of ARAS can also increase transparency in the decision-making process, as every step in the analysis can be clearly explained and accounted for. Although the ARAS method offers various advantages in multi-criteria evaluation, it also has some drawbacks that need to be noted. One of the main drawbacks is its reliance on accurate criterion weighting, which can be subjective and difficult to measure consistently. It is important to consider these limitations and combine ARAS with other methods to obtain more robust and reliable results. One of the proposed weighting methods to reduce subjectivity in weight determination is to use the objective weighting method.

The objective weighting method is an approach used in multi-criteria decision-making to determine the weight of each criterion quantitatively and independently of the subjective judgment of the decision-makers(Dhruva et al., 2024; Dua et al., 2024; Han et al., 2020). This method aims to reduce subjectivity and increase transparency in the evaluation process by relying on data and statistics to allocate the weight of criteria based on their relative significance or contribution to the final goal. Objective weighting is an important tool in situations where quantitative data is available and necessary to support more equitable and rational decisions. One of the methods of weighting objectively is Method based on the Removal Effects of Criteria. Method based on the Removal Effects of Criteria (MEREC) is a technique used in multi-criteria decision-making analysis to evaluate the impact of the removal of each criterion on the overall outcome(Keshavarz-Ghorabaee et al., 2021; Saidin et al., 2023; Ulutaş et al., 2023). This method focuses on identifying and measuring how much change occurs in alternative rankings when one criterion is removed from consideration. Using MEREC, decision-makers can determine which criteria have the most influence on the final outcome and evaluate the sensitivity of the decision to changes in the criteria considered. This approach is very useful for optimizing the evaluation model by identifying the most important criteria and understanding how they contribute to the final decision. The MEREC provides in-depth insights into the stability and robustness of decisions taken, as well as assists in the development of more effective and informed evaluation models(Mishra et al., 2022; Saidin et al., 2023; Ulutaş et al., 2023). Using MEREC, decision-makers can create evaluation models that are more adaptive and responsive to change, as well as identify potential biases or weaknesses in judgment. This method also allows for a more in-depth evaluation of how changes in criteria can affect the outcome of a decision, thus providing a stronger foundation for making strategic decisions. MEREC can assist in the model validation process by ensuring that decisions are made consistently and relevant despite changes in evaluation parameters.

The combination of the MEREC and ARAS methods offers a robust approach to multi-criteria evaluation by combining the advantages of both techniques. The MEREC provides insight into the impact of the elimination of each criterion on alternative rankings, allowing decision-makers to identify the most influential criteria and improve the robustness of the evaluation model. ARAS provides an objective scoring system that balances the weighting of criteria based on quantitative data, ensuring that decisions are based on the tangible contribution of each criterion. By integrating MEREC and ARAS, organizations can harness the power of criterion impact analysis and data-driven assessments to create more accurate, transparent, and adaptive evaluation models. This combination helps in optimizing decisions by taking into account both the relative influence of the criteria and the weights set objectively, resulting in more informed and effective decisions.

Research related to the conduct of which became the literature in this study from Sanriomi (2024) selects barista admissions by applying a combination of MOORA and PIPRECIA methods based on the criteria used and providing recommendations for management in selecting barista admissions(Sintaro & Setiawansyah, 2024). Research from Aldisa (2023) the ROC method and the MOORA method produced a value of 0.2608 on behalf of Diki Aji as the best alternative to Barista Coffee(Aldisa, 2023). Research from Gulo (2021) the application of the WASPAS and DEMATEL methods helps decision-makers in making more informed decisions in selecting prospective baristas at the Medan coffee corner(Gulo, 2021). Research from Rizki (2019) the WASPAS method helps in producing the best coffee blender so that the results obtained can be used as a reference in ranking(Rizki et al., 2019). The main difference lies in

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

the method used in this study using the objective weighting method, namely the MEREC method to obtain the objective weight of the criteria.

The purpose of the research on the Combination of Objective Weighting Methods and ARAS in Coffee Barista Admission is to develop and apply a more systematic and objective approach in the selection process of prospective baristas. This study aims to integrate the objective weighting method that reduces subjective preferences in determining the weighting of criteria with the ARAS method that assesses alternatives based on the relative contribution of the criteria quantitatively. With this combination, it can increase accuracy and transparency in the evaluation of prospective baristas, providing clearer and measurable guidance for managers in decision-making.

2. RESEARCH METHODOLOGY

2.1 Research Stages

In a research, systematic and structured stages are very important to ensure that the research process runs well and the results obtained can be accounted for(Setiawansyah et al., 2023; Sulistiani et al., 2023). The research stage generally starts from problem identification, where the researcher describes the problem to be solved and formulates the research objectives, and ends with recommendations or implications of the research results. The stages of the research carried out are shown in Figure 1.

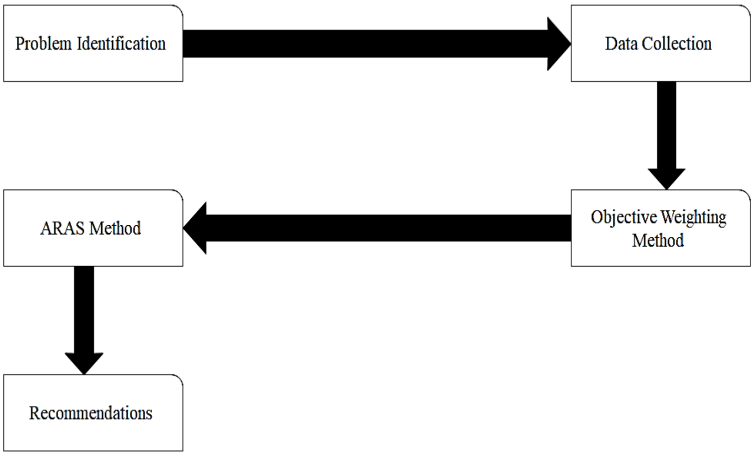


Figure 1. Research Stage

The research stage carried out from figure 1 is the first stage of problem identification, namely the research begins by identifying the need to improve the barista selection process in coffee shops, with the aim of finding a more objective and accurate evaluation method. Data Collection i.e. Data about barista candidates is collected, covering a variety of relevant criteria such as technical skills, experience, and ability to interact with customers. The objective weighting method is a technique used to determine the relative weight or importance of various criteria in an analysis, based on the available data, without involving subjective judgment from experts. This method is useful in decision-making that requires multi-criteria assessment, where it is important to avoid subjective bias. The ARAS (Additive Ratio Assessment) method is one of the multi-criteria decision-making methods (MCDM) used to assess and rank alternatives based on several criteria. The recommendations of the research ended by providing the results of the research that outlined the effectiveness of the method developed, as well as recommendations for implementation in the barista selection process.

2.2 Objective Weighting Method

The objective weighting method is a technique used to determine the weight or level of importance of various criteria in the decision-making process, without involving the subjectivity of the assessor. This method leverages available data, such as variation, correlation, and uncertainty, to generate weights that reflect the importance of each criterion proportionally. Method based on the Removal Effects of Criteria (MEREC) is an objective approach in determining the weighting of criteria that focuses on the impact of the elimination of criteria on the overall alternative rating in a multi-criteria analysis. In this method, the criterion weights are determined based on the changes that occur in the final result when a criterion is removed from the calculation. The greater the effect of the elimination of a criterion on the overall ranking, the higher the weight given to the criterion. MEREC offers a systematic way to ensure that each criterion is assessed according to its apparent influence on the final decision, avoiding subjectivity and providing more accurate weights based on the actual impact of each criterion. The stages in the MEREC method are the first decision matrix made with equation (1).

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

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

The second stage of normalization is carried out to make the performance values between the criteria comparable. This is important because the criteria may have different scales using equation (2).

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

The third stage of ranking calculation without elimination of criteria, determine the overall ranking of alternatives based on all criteria without deleting a single criterion. This will be the baseline rating used for comparison using equation (3).

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

Fourth stage phased removal of criteria, for each criterion, remove the criteria from the decision matrix and recalculate the overall rating of the alternatives based on the remaining criteria using equation (4).

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

The fifth stage of calculating the Effect of Elimination of Criteria, Calculate changes in the overall ranking due to the elimination of each criterion. This change shows the effect of removing criteria on the final decision using equation (5).

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

The sixth stage of determining the weight of criteria, the weight of each criterion is determined based on the magnitude of the change that occurred when the criterion was removed. Criteria that cause a larger ranking change will be given higher weight, as it indicates that they are more important using equation (6).

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

The MEREC method provides a systematic and data-driven way to determine the weight of criteria, ensuring that each criterion is assessed according to its apparent influence on the final decision.

2.3 ARAS Method

The ARAS (Additive Ratio Assessment) method is one of the multi-criteria decision-making methods used to assess and rank alternatives based on several criteria objectively. This method works by calculating the relative performance value of each alternative to the ideal solution, through the process of normalizing the data and determining the weight of the criteria. After that, the aggregate performance value of each alternative is calculated by summing the product from the normalized performance value and the weight of the criteria. This value is then used to determine the optimal ratio of each alternative, which indicates how well it compares to the others. ARAS is known for its simplicity and ability to provide accurate and consistent results in complex decision-making. The first stage in the ARAS method is normalization aiming to convert the criterion data from each alternative into a form that can be compared to each other. This process ensures that all criteria are on the same scale and makes it easy to calculate relative values. equation (7) for the benefit criterion and equation (8) for the cost criterion.

$$\overline{x_{ij}} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \tag{7}$$

$$x_{ij} = \frac{1}{x_{ij}^{*}}; \qquad \overline{x_{ij}} = \frac{x_{ij}}{\sum_{i=0}^{m} x_{ij}} \tag{8}$$

The next step is to calculate the final value of each alternative by considering the weight of the criteria using equation (9).

$$d_{ij} = \overline{x_{ij}} * w_j \tag{9}$$

The next step is to calculate the optimization value, which usually refers to the achievement of the maximum expected value based on predetermined criteria. The optimization process involves determining the best alternative based on the final score calculated using equation (10).

$$s_i = \sum_{j=1}^{n} d_{ij} \tag{10}$$

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

The final step is to calculate the alternative final score is the result of an evaluation and calculation process that takes into account the normalization of the data, the weight of the criteria, and the final score. This final value reflects the overall performance of each alternative based on all the predetermined criteria calculated using equation (11).

$$K_i = \frac{s_i}{s_o} \tag{11}$$

The final result of the ARAS method is the final assessment or rating for each alternative based on the total score calculated after the evaluation process.

3. RESULTS AND DISCUSSION

The combination of objective weighting methods and the new additive ratio assessment (ARAS) approach offers a sophisticated framework for evaluating candidates in coffee barista admissions. The objective weighting method ensures that evaluation criteria are prioritized based on their intrinsic importance, thereby minimizing subjective preference. When combined with the ARAS method, which ranks alternatives based on their performance ratio to the ideal solution, this approach provides a balanced and comprehensive assessment for each candidate. This methodology is particularly effective in scenarios such as barista admissions, where various factors such as technical skills, creativity, and customer service must be evaluated objectively and fairly to select the most qualified individuals. By utilizing this combination, the barista selection process becomes more transparent and accountable, considering that every decision is based on measurable data and the relevance of objective criteria. This is important in the competitive coffee industry, where the quality of service and technical abilities of baristas can significantly affect customer satisfaction and business success. The use of this method also allows for a more holistic evaluation, incorporating the various important aspects of an ideal barista, so that the end result is the selection of candidates who not only meet technical standards but also have the potential to grow and provide added value in the work environment.

3.1 Problem Identification

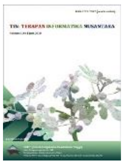
Identifying problems in the selection of barista admissions is a crucial step to ensure that the recruitment process runs effectively and fairly. One of the main problems is subjective bias in judgment, where personal preferences or perceptions that are not based on objective criteria can influence selection decisions. Additionally, the lack of clear and consistent evaluation standards can lead to inconsistencies in the assessment of the skills and competencies of prospective baristas. Other challenges include difficulty in assessing the quality of soft skills, such as communication skills and customer service, which are often not quantitatively measured. All of these issues can result in the selection of unsuitable candidates, which can ultimately negatively impact the quality of service and reputation of the coffee shop. In addition, limitations in evaluation tools or methods are also an obstacle, especially if the assessment only focuses on technical aspects without considering the creativity and adaptability of prospective baristas. A selection process that is too short or not thorough can also lead to inaccurate evaluations, so that the best potential of a candidate may not be identified. The absence of systematic feedback to candidates after the selection process can also be problematic, as they do not get the opportunity to understand their strengths and weaknesses, which can help in further career development. Therefore, it is important to adopt a comprehensive, data-driven selection approach to minimize these issues and ensure that the selected candidates are truly suited to the needs and vision of the coffee shop.

3.2 Data Collection

Data collection in the selection of barista admissions is a crucial stage that determines the accuracy and objectivity of the recruitment process. The data collected should cover a wide range of aspects, from technical skills such as the ability to brew coffee and operate an espresso machine, to soft skills such as communication, customer service, and the ability to work under pressure. The use of various data collection methods, such as practical tests, interviews, and job situation simulations, can provide a more comprehensive picture of the competencies of prospective baristas. Additionally, additional data such as previous work experience, portfolios, and references from previous workplaces can also provide important information to assess a candidate's fit for the coffee shop's culture and operational needs. With thorough and structured data collection, the selection process becomes more transparent and allows for the selection of the most suitable candidates for the role. Table 1 is the criteria data used in this study.

Table 1. Barista Admission Selection Criteria Data

Criteria Name
Technical Skills
Work Experience
Communication
Creativity and Innovation
Flexibility
Attitude and Motivation


TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

The criterion data in table 1 is the criterion data used in the selection of barista admissions, for each criterion assessment a scale of 1-100 is used for each existing criterion from the assessment of prospective barista candidates. The criteria used do not have the weight of the criteria, the weight of the criteria will be calculated by the objective weighting method using the MEREC method. The data in the selection of barista admissions used in this study are shown in Table 2.

Table 2. The data in the selection of barista admissions

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
Andi Pratama	85	78	90	80	88	92
Bella Sari	78	82	85	75	80	86
Clara Dewi	92	89	88	92	85	90
Daniel Putra	80	76	82	78	84	87
Erika Santosa	88	84	90	85	90	91
Farhan Ali	75	80	80	70	75	80
Gabriel Arief	82	77	86	81	87	88
Hanafi Lestari	90	81	91	89	83	93
Indah Puspita	77	79	83	76	82	85
Joko Subroto	86	83	87	82	89	90
Kanya Wijaya	81	75	84	79	80	84
Laila Indah	89	80	88	87	86	89
Miko Ardiansyah	74	72	78	70	77	76

The candidate assessment data in table 1 was obtained through a criteria-based evaluation process involving various assessment methods. This data is collected through interviews, skills tests, and assessments from relevant references. The assessment includes aspects such as technical skills, work experience, communication, creativity and innovation, flexibility, and attitude and motivation. Data collection methods can include assessment forms, questionnaire-based assessments, and direct observation during the interview and test process, which are then processed to provide a comprehensive overview of each candidate's qualifications and potential.

3.3 Determining the Weight of Criteria Using the Objective Weighting Method

Determining the weight of criteria using the objective weighting method is a systematic approach to determine the importance of each evaluation criterion based on factual and measurable data. By utilizing the MEREC method, the criterion weights are established through comparative analysis or measurement of information diversity, which reduces the influence of subjective judgment. This process begins with the collection of related data, followed by the determination and normalization of weights to ensure that the total weights of the criteria reflect the proper priorities. The final result is an objective and accountable weight, which allows the evaluation of candidates to be carried out fairly and consistently, in accordance with the needs and objectives that have been set. The stages in the MEREC method are the first decision matrix made with equation (1).

$$X = \begin{bmatrix} 85 & 78 & 90 & 80 & 88 & 92 \\ 78 & 82 & 85 & 75 & 80 & 86 \\ 92 & 89 & 88 & 92 & 85 & 90 \\ 80 & 76 & 82 & 78 & 84 & 87 \\ 88 & 84 & 90 & 85 & 90 & 91 \\ 75 & 80 & 80 & 70 & 75 & 80 \\ 82 & 77 & 86 & 81 & 87 & 88 \\ 90 & 81 & 91 & 89 & 83 & 93 \\ 77 & 79 & 83 & 76 & 82 & 85 \\ 86 & 83 & 87 & 82 & 89 & 90 \\ 81 & 75 & 84 & 79 & 80 & 84 \\ 89 & 80 & 88 & 87 & 86 & 89 \\ 74 & 72 & 78 & 70 & 77 & 76 \end{bmatrix}$$

The second stage of normalization is carried out to make the performance values between the criteria comparable. This is important because the criteria may have different scales using equation (2).

$$n_{11} = \frac{x_{11}}{\max x_{11,113}} = \frac{85}{92} = 0.9239$$

The overall results of the normalization value of the MEREC weighting method for all alternatives of the overall criteria are shown in table 3.

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

Table 3. The overall results of the normalization value of the MEREC weighting method

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
Andi Pratama	0.9239	0.8764	0.989	0.8696	0.9778	0.9892
Bella Sari	0.8478	0.9213	0.9341	0.8152	0.8889	0.9247
Clara Dewi	1	1.	0.967	1	0.9444	0.9677
Daniel Putra	0.8696	0.8539	0.9011	0.8478	0.9333	0.9355
Erika Santosa	0.9565	0.9438	0.989	0.9239	1	0.9785
Farhan Ali	0.8152	0.8989	0.8791	0.7609	0.8333	0.8602
Gabriel Arief	0.8913	0.8652	0.9451	0.8804	0.9667	0.9462
Hanafi Lestari	0.9783	0.9101	1	0.9674	0.9222	1
Indah Puspita	0.837	0.8876	0.9121	0.8261	0.9111	0.914
Joko Subroto	0.9348	0.9326	0.956	0.8913	0.9889	0.9677
Kanya Wijaya	0.8804	0.8427	0.9231	0.8587	0.8889	0.9032
Laila Indah	0.9674	0.8989	0.967	0.9457	0.9556	0.957
Miko Ardiansyah	0.8043	0.809	0.8571	0.7609	0.8556	0.8172

The third stage of ranking calculation without elimination of criteria, determine the overall ranking of alternatives based on all criteria without deleting a single criterion. This will be the baseline rating used for comparison using equation (3).

$$S_1 = \ln\left(1 + \left(\frac{1}{6}\sum\left|\ln\left(n_{11,61}\right)\right|\right)\right) = \ln(1 + \left(\frac{1}{6}\right) * 0.39516) = 0.0638$$

The overall results of the calculation without elimination of criteria MEREC weighting method for all existing alternatives are shown in table 4.

Table 4. The overall results of the calculation without elimination of criteria MEREC weighting method

Name	S_i
Andi Pratama	0.0638
Bella Sari	0.1127
Clara Dewi	0.0204
Daniel Putra	0.1107
Erika Santosa	0.0351
Farhan Ali	0.1607
Gabriel Arief	0.0851
Hanafi Lestari	0.0377
Indah Puspita	0.1197
Joko Subroto	0.0553
Kanya Wijaya	0.1178
Laila Indah	0.0517
Miko Ardiansyah	0.1844

Fourth stage phased removal of criteria, for each criterion, remove the criteria from the decision matrix and recalculate the overall rating of the alternatives based on the remaining criteria using equation (4).

$$S'_{11} = \ln\left(1 + \left(\frac{1}{6}\sum_{k,k\neq j}\left|\ln\left(n_{12,62}\right)\right|\right)\right) = \ln(1 + \left(\frac{1}{6}\right) * 0.31602) = 0.05133$$

The overall results of the calculation value of the gradual elimination of criteria for each criterion of the MEREC weighting method for all existing alternatives are shown in table 5.

Table 5. The overall results of the calculation value of the gradual elimination of criteria for each criterion

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
Andi Pratama	0.05133	0.04294	0.06205	0.04169	0.06026	0.06209
Bella Sari	0.08778	0.10039	0.10246	0.08177	0.09497	0.10094
Clara Dewi	0.02037	0.02037	0.01488	0.02037	0.01099	0.015
Daniel Putra	0.08966	0.08689	0.09507	0.08579	0.10038	0.10073
Erika Santosa	0.0279	0.02573	0.0333	0.02226	0.03508	0.03157
Farhan Ali	0.13127	0.14544	0.14224	0.12113	0.13447	0.13909
Gabriel Arief	0.06732	0.06268	0.07641	0.06541	0.07989	0.0766
Hanafi Lestari	0.03413	0.02243	0.03766	0.03233	0.02458	0.03766
Indah Puspita	0.09308	0.10197	0.10605	0.09109	0.10589	0.10636

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
Joko Subroto	0.04462	0.04424	0.0482	0.037	0.05355	0.05013
Kanya Wijaya	0.0988	0.09217	0.10592	0.09502	0.10025	0.10265
Laila Indah	0.04648	0.03472	0.04642	0.04285	0.04452	0.04475
Miko Ardiansyah	0.15376	0.15458	0.16281	0.14579	0.16254	0.15603

The fifth stage of calculating the Effect of Elimination of Criteria, Calculate changes in the overall ranking due to the elimination of each criterion. This change shows the effect of removing criteria on the final decision using equation (5).

$E_{11} = |S'_{11} - S_1| = |0.05133 - 0.0638| = 0.01245$

The overall results of the calculating the effect of elimination of criteria of the MEREC weighting method for all existing alternatives are shown in table 6.

Table 6. The overall results of the calculating the effect of elimination of criteria

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
Andi Pratama	0.01245	0.02085	0.00173	0.02210	0.00352	0.00169
Bella Sari	0.02489	0.01227	0.01021	0.03089	0.01769	0.01172
Clara Dewi	0	0	0.00549	0	0.00938	0.00537
Daniel Putra	0.02107	0.02384	0.01566	0.02494	0.01035	0.01000
Erika Santosa	0.00718	0.00935	0.00178	0.01282	0	0.00350
Farhan Ali	0.02942	0.01525	0.01845	0.03956	0.02622	0.02160
Gabriel Arief	0.01777	0.02242	0.00869	0.01968	0.00520	0.00850
Hanafi Lestari	0.00353	0.01523	0	0.00534	0.01308	0
Indah Puspita	0.02667	0.01778	0.01370	0.02866	0.01386	0.01339
Joko Subroto	0.01069	0.01107	0.00711	0.01831	0.00176	0.00518
Kanya Wijaya	0.01904	0.02568	0.01193	0.02283	0.01760	0.01519
Laila Indah	0.00526	0.01702	0.00532	0.00888	0.00722	0.00698
Miko Ardiansyah	0.03064	0.02982	0.02160	0.03861	0.02186	0.02838
$\sum E_j$	0.20863	0.22057	0.12167	0.27262	0.14775	0.13151

The sixth stage of determining the weight of criteria, the weight of each criterion is determined based on the magnitude of the change that occurred when the criterion was removed. Criteria that cause a larger ranking change will be given higher weight, as it indicates that they are more important using equation (6).

$$w_1 = \frac{E_1}{\sum_k E_{1,6}} = \frac{0.20863}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.1892$$

$$w_2 = \frac{E_2}{\sum_k E_{1,6}} = \frac{0.22057}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.2$$

$$w_3 = \frac{E_3}{\sum_k E_{1,6}} = \frac{0.12167}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.1103$$

$$w_4 = \frac{E_4}{\sum_k E_{1,6}} = \frac{0.27262}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.2472$$

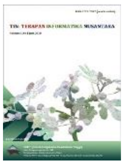
$$w_5 = \frac{E_5}{\sum_k E_{1,6}} = \frac{0.14775}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.134$$

$$w_6 = \frac{E_6}{\sum_k E_{1,6}} = \frac{0.13151}{0.20863+0.22057+0.12167+0.27262+0.14775+0.13151} = 0.1193$$

The end result of the weighted value with the MEREC method is a weight that is proportional to the amount of information provided by each criterion, ensuring that more informative or diverse criteria have greater weight in the evaluation process.

3.4 Barista Admission Selection Using the ARAS Method

Barista admission selection using the ARAS method is a multi-criteria-based approach designed to evaluate candidates comprehensively and objectively. The ARAS method involves assessing various important criteria, such as technical skills in coffee serving, work experience, communication skills, and attitudes and motivations. In this method, each criterion is weighted according to its importance, and the candidate's score on each criterion is calculated and normalized. The next process is to calculate the scoring ratio for each candidate, which allows them to be ranked based on performance relative to all criteria. By using the ARAS method, companies can systematically determine the most


TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

qualified candidates, ensuring that the selection process is conducted fairly and based on measurable data. This process ensures that all criteria are on the same scale and makes it easy to calculate relative values using equation (7).

$$\overline{x_{10}} = \frac{\max x_{11,113}}{\sum_{i=0}^{m} x_{11,113}} = \frac{85}{1077} = 0.07892$$

$$\overline{x_{11}} = \frac{x_{11}}{\sum_{i=0}^{m} x_{11,113}} = \frac{92}{1077} = 0.08542$$

The overall results of the normalization value of the ARAS method for all alternatives of the overall criteria are shown in table 7.

Table 7. The overall results of the normalization value of the ARAS method

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
	0.08542	0.08591	0.08183	0.08812	0.08287	0.08223
Andi Pratama	0.07892	0.07529	0.08094	0.07663	0.08103	0.08134
Bella Sari	0.07242	0.07915	0.07644	0.07184	0.07366	0.07604
Clara Dewi	0.08542	0.08591	0.07914	0.08812	0.07827	0.07958
Daniel Putra	0.07428	0.07336	0.07374	0.07471	0.07735	0.07692
Erika Santosa	0.08171	0.08108	0.08094	0.08142	0.08287	0.08046
Farhan Ali	0.06964	0.07722	0.07194	0.06705	0.06906	0.07073
Gabriel Arief	0.07614	0.07432	0.07734	0.07759	0.08011	0.07781
Hanafi Lestari	0.08357	0.07819	0.08183	0.08525	0.07643	0.08223
Indah Puspita	0.07149	0.07625	0.07464	0.07280	0.07551	0.07515
Joko Subroto	0.07985	0.08012	0.07824	0.07854	0.08195	0.07958
Kanya Wijaya	0.07521	0.07239	0.07554	0.07567	0.07366	0.07427
Laila Indah	0.08264	0.07722	0.07914	0.08333	0.07919	0.07869
Miko Ardiansyah	0.06871	0.06950	0.07014	0.06705	0.07090	0.06720

The next step is to calculate the final value of each alternative by considering the weight of the criteria using equation (9).

$$d_{11} = \overline{x_{11}} * w_1 = 0.07892 * 0.1892 = 0.01493$$

The overall results of the calculate the final value of each alternative by considering the weight of the criteria are shown in table 8.

Table 8. The overall results of the calculate the final value of each alternative of the ARAS method

Name	Technical Skills	Work Experience	Communication	Creativity and Innovation	Flexibility	Attitude and Motivation
	0.01616	0.01718	0.00903	0.02179	0.01110	0.00981
Andi Pratama	0.01493	0.01506	0.00893	0.01894	0.01086	0.00970
Bella Sari	0.01370	0.01583	0.00843	0.01776	0.00987	0.00907
Clara Dewi	0.01616	0.01718	0.00873	0.02179	0.01049	0.00949
Daniel Putra	0.01405	0.01467	0.00814	0.01847	0.01036	0.00917
Erika Santosa	0.01546	0.01622	0.00893	0.02013	0.01110	0.00960
Farhan Ali	0.01317	0.01545	0.00794	0.01658	0.00925	0.00844
Gabriel Arief	0.01440	0.01487	0.00853	0.01918	0.01073	0.00928
Hanafi Lestari	0.01581	0.01564	0.00903	0.02108	0.01024	0.00981
Indah Puspita	0.01353	0.01525	0.00824	0.01800	0.01012	0.00896
Joko Subroto	0.01511	0.01602	0.00863	0.01942	0.01098	0.00949
Kanya Wijaya	0.01423	0.01448	0.00833	0.01871	0.00987	0.00886
Laila Indah	0.01563	0.01545	0.00873	0.02060	0.01061	0.00938
Miko Ardiansyah	0.01300	0.01390	0.00774	0.01658	0.00950	0.00801

The next step is to calculate the optimization value, which usually refers to the achievement of the maximum expected value based on predetermined criteria. The optimization process involves determining the best alternative based on the final score calculated using equation (10).

$$s_0 = \sum_{j=1}^{n} d_{10,60} = 0.01616 + 0.01718 + 0.00903 + 0.02179 + 0.0111 + 0.00981 = 0.08507$$

$$s_1 = \sum_{j=1}^{n} d_{11,61} = 0.01493 + 0.01506 + 0.00893 + 0.01894 + 0.01086 + 0.0097 = 0.07842$$

The overall results of the calculate the final value of each alternative by considering the weight of the criteria are shown in table 9.

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

Table 9. The overall results of the calculate the optimization value of the ARAS method

Name	s_j
s_0	0.08507
Andi Pratama	0.07842
Bella Sari	0.07467
Clara Dewi	0.08384
Daniel Putra	0.07487
Erika Santosa	0.08143
Farhan Ali	0.07082
Gabriel Arief	0.07700
Hanafi Lestari	0.08160
Indah Puspita	0.07409
Joko Subroto	0.07965
Kanya Wijaya	0.07448
Laila Indah	0.08041
Miko Ardiansyah	0.06873

The final step is to calculate the alternative final score is the result of an evaluation and calculation process that takes into account the normalization of the data, the weight of the criteria, and the final score. This final value reflects the overall performance of each alternative based on all the predetermined criteria calculated using equation (11).

$$K_1 = \frac{s_1}{s_o} = \frac{0.07842}{0.08507} = 0.92187$$

The overall results of the calculate the final value reflects the overall performance of each alternative are shown in table 10.

Table 10. The overall results of the final value the overall performance of each alternative of the ARAS method

Name	Final Value
Andi Pratama	0.92187
Bella Sari	0.87770
Clara Dewi	0.98553
Daniel Putra	0.88011
Erika Santosa	0.95726
Farhan Ali	0.83253
Gabriel Arief	0.90512
Hanafi Lestari	0.95921
Indah Puspita	0.87094
Joko Subroto	0.93632
Kanya Wijaya	0.87550
Laila Indah	0.94520
Miko Ardiansyah	0.80792

The final score of the barista selection using the ARAS Method shows the ranking of each candidate based on their performance against various criteria that have been set, such as technical skills, work experience, communication, and attitude and motivation. After the weight of each criterion is applied, the score of each candidate is calculated through the process of normalization and summation of the scoring ratio. The candidate with the highest total score is considered the most qualified, as they have shown the best overall performance in all aspects of the assessment. Thus, the end result of the ARAS method provides an objective, transparent, and measurable selection decision, ensuring that the best candidates are selected for barista positions.

3.5 Recommendations Barista Admission Selection

Barista admission selection recommendations should be based on a comprehensive and thorough evaluation of various aspects relevant to the job. Criteria such as technical skills in making and serving coffee, work experience in the service industry, effective communication skills, and a friendly and highly motivated attitude should be the main focus in the selection process. In addition, flexibility in dealing with change and the ability to innovate are also important to create a satisfying customer experience. By combining quantitative and qualitative assessments, as well as using objective evaluation methods such as ARAS or other weighting methods, companies can ensure that recommended candidates have the best potential to succeed in the role and contribute positively to the team and the business as a whole. Figure 1 is the result of the barista admission selection ranking.

TIN: Terapan Informatika Nusantara
Vol 5, No 3,August 2024, page 220-231
ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

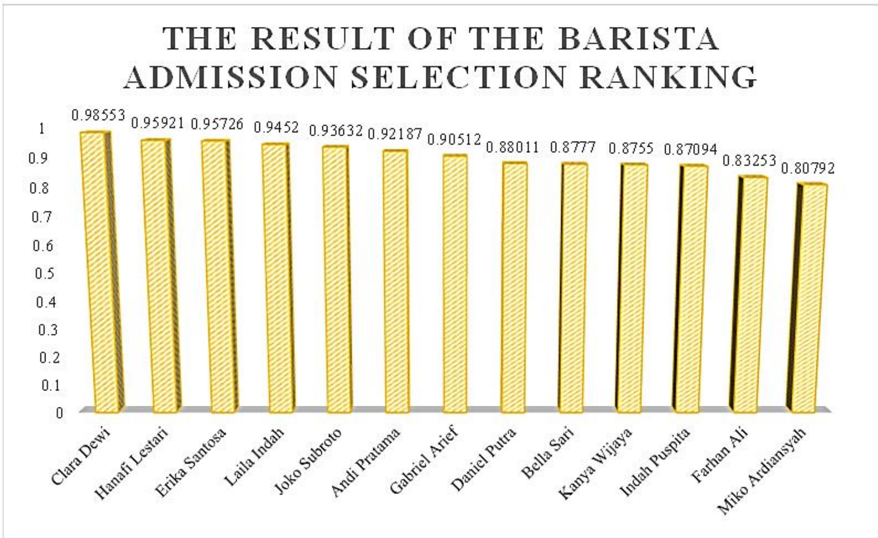


Figure 2. The Result of the Barista Admission Selection Ranking

Based on the results of the evaluation of the barista admission selection in figure 2, Clara Dewi ranked first with the highest final score of 0.98553, followed by Hanafi Lestari with a score of 0.95921 and Erika Santosa with a score of 0.95726 who ranked second and third. Laila Indah and Joko Subroto rounded out the top five with scores of 0.9452 and 0.93632, respectively. Furthermore, Andi Pratama and Gabriel Arief are ranked sixth and seventh with values of 0.92187 and 0.90512. Daniel Putra, Bella Sari, and Kanya Wijaya each ranked eighth to tenth, followed by Indah Puspita, Farhan Ali, and Miko Ardiansyah who ranked eleventh to thirteenth. Clara Dewi stood out as the strongest candidate in this selection, while Miko Ardiansyah was in last position with a score of 0.80792.

4. CONCLUSION

This research makes a significant contribution in the field of decision support systems by developing a combination of objective weighting methods using the MEREC method and a new additive ratio assessment for coffee barista selection. Through this approach, the research overcomes the limitations of traditional methods by offering a more accurate and transparent way to evaluate barista candidates based on relevant criteria such as technical skills, creativity, and customer service. This innovation allows for more objective decision-making and can be widely applied in the recruitment process in the service industry, especially in selecting qualified workers in specific roles such as baristas. This methodology is particularly effective in scenarios such as barista admissions, where various factors such as technical skills, creativity, and customer service must be evaluated objectively and fairly to select the most qualified individuals. By utilizing this combination, the barista selection process becomes more transparent and accountable, considering that every decision is based on measurable data and the relevance of objective criteria. This is important in the competitive coffee industry, where the quality of service and technical abilities of baristas can significantly affect customer satisfaction and business success. The use of this method also allows for a more holistic evaluation, incorporating the various important aspects of an ideal barista, so that the end result is the selection of candidates who not only meet technical standards but also have the potential to grow and provide added value in the work environment. Based on the results of the evaluation of the barista admission selection, Clara Dewi ranked first with the highest final score of 0.98553, followed by Hanafi Lestari with a score of 0.95921 and Erika Santosa with a score of 0.95726 who ranked second and third.

REFERENCES

Aldisa, R. T. (2023). Sistem Pendukung Keputusan Pemilihan Barista Coffee Terbaik Menerapkan Metode Multi Objective Optimization on The Basis of Ratio Analysis (MOORA) dan ROC. *KLIK: Kajian Ilmiah Informatika Dan Komputer*, *3*(6), 1022–1030. https://doi.org/10.30865/klik.v3i6.959

Baraily, A., Ghadai, R. K., Das, S., & Phipon, R. (2023). Multi-objective optimization in MQCL turning of AISI 304 steel using MEREC, CODAS, ARAS and COPRAS method. *AIP Conference Proceedings*, *2786*(1), 020011. https://doi.org/10.1063/5.0146135

Bošković, S., Švadlenka, L., Dobrodolac, M., Jovčić, S., & Zanne, M. (2023). An Extended AROMAN Method for Cargo Bike Delivery Concept Selection. *Decision Making Advances*, *1*(1), 1–9. https://doi.org/10.31181/v120231

Dhruva, S., Krishankumar, R., Zavadskas, E. K., Ravichandran, K. S., & Gandomi, A. H. (2024). Selection of Suitable Cloud Vendors for Health Centre: A Personalized Decision Framework with Fermatean Fuzzy Set, LOPCOW, and CoCoSo. *Informatica*, *35*(1), 65–98. https://doi.org/10.15388/23-INFOR537

Dua, T. Van, Duc, D. Van, Bao, N. C., & Trung, D. D. (2024). Integration of objective weighting methods for criteria

ISSN 2722-7987 (Media Online)
Website https://ejurnal.seminar-id.com/index.php/tin
DOI 10.47065/tin.v5i3.5771

and MCDM methods: application in material selection. *EUREKA: Physics and Engineering*, *2*, 131–148. https://doi.org/10.21303/2461-4262.2024.003171

Gulo, Y. K. (2021). Sistem Pendukung Keputusan Pemilihan Calon Barista Dengan Menggunakan Metode DEMATEL Dan WASPAS (Studi Kasus: Coffee Corner Medan). *KLIK: Kajian Ilmiah Informatika Dan Komputer*, *1*(5), 210–217.

Han, H.-C., Wan, H., & Wang, X. (2020). Quantifying Engineering Faculty Performance Based on Expectations on Key Activities and Integration Using Flexible Weighting Factors. *Journal of Biomechanical Engineering*, *142*(11), 114701. https://doi.org/10.1115/1.4047478

Keshavarz-Ghorabaee, M., Amiri, M., Zavadskas, E. K., Turskis, Z., & Antucheviciene, J. (2021). Determination of Objective Weights Using a New Method Based on the Removal Effects of Criteria (MEREC). *Symmetry*, *13*(4), 525. https://doi.org/10.3390/sym13040525

Mishra, A. R., Tripathi, D. K., Cavallaro, F., Rani, P., Nigam, S. K., & Mardani, A. (2022). Assessment of Battery Energy Storage Systems Using the Intuitionistic Fuzzy Removal Effects of Criteria and the Measurement of Alternatives and Ranking Based on Compromise Solution Method. *Energies*, *15*(20), 7782. https://doi.org/10.3390/en15207782

Panigrahi, N., Ayus, I., & Jena, O. P. (2021). An Expert System-Based Clinical Decision Support System for Hepatitis-B Prediction & Diagnosis. In *Machine Learning for Healthcare Applications* (pp. 57–75). Wiley. https://doi.org/10.1002/9781119792611.ch4

Putra, A. D., Arshad, M. W., Setiawansyah, S., & Sintaro, S. (2024). Decision Support System for Best Honorary Teacher Performance Assessment Using a Combination of LOPCOW and MARCOS. *Journal of Computer System and Informatics (JoSYC)*, *5*(3), 578–590. https://doi.org/10.47065/josyc.v5i3.5127

Rizki, N., Nofriansyah, D., & Calam, A. (2019). Sistem Pendukung Keputusan Menentukan Peracik Kopi Terbaik di Uleekareng dengan Metode WASPAS (Weighted Aggregated Sum Product Assesment). *Jurnal Cyber Tech*, *2*(8). https://doi.org/10.53513/jct.v2i8.3650

Rong, Y., Yu, L., Liu, Y., Simic, V., & Garg, H. (2024). The FMEA model based on LOPCOW-ARAS methods with interval-valued Fermatean fuzzy information for risk assessment of R&D projects in industrial robot offline programming systems. *Computational and Applied Mathematics*, *43*(1), 25. https://doi.org/10.1007/s40314-023-02532-2

Saidin, M. S., Lee, L. S., Marjugi, S. M., Ahmad, M. Z., & Seow, H.-V. (2023). Fuzzy Method Based on the Removal Effects of Criteria (MEREC) for Determining Objective Weights in Multi-Criteria Decision-Making Problems. *Mathematics*, *11*(6), 1544. https://doi.org/10.3390/math11061544

Setiawansyah, Aldino, A. A., Palupiningsih, P., Laxmi, G. F., Mega, E. D., & Septiana, I. (2023). Determining Best Graduates Using TOPSIS with Surrogate Weighting Procedures Approach. *2023 International Conference on Networking, Electrical Engineering, Computer Science, and Technology (IConNECT)*, 60–64. https://doi.org/10.1109/IConNECT56593.2023.10327119

Siciliani, L., Taccardi, V., Basile, P., Di Ciano, M., & Lops, P. (2023). AI-based decision support system for public procurement. *Information Systems*, *119*, 102284. https://doi.org/10.1016/j.is.2023.102284

Sintaro, S. (2023). Sistem Pendukung Keputusan Penentuan Barista Terbaik Menggunakan Rank Sum dan Additive Ratio Assessment (ARAS). *Jurnal Ilmiah Computer Science*, *2*(1), 39–49. https://doi.org/10.58602/jics.v2i1.15

Sintaro, S., & Setiawansyah, S. (2024). Kombinasi Multi-Objective Optimization on the basis of Ratio Analysis (MOORA) dan PIPRECIA dalam Seleksi Penerimaan Barista. *Jurnal Ilmiah Informatika Dan Ilmu Komputer (JIMA-ILKOM)*, *3*(1), 13–23. https://doi.org/10.58602/jima-ilkom.v3i1.23

Sulistiani, H., Setiawansyah, Palupiningsih, P., Hamidy, F., Sari, P. L., & Khairunnisa, Y. (2023). Employee Performance Evaluation Using Multi-Attribute Utility Theory (MAUT) with PIPRECIA-S Weighting: A Case Study in Education Institution. *2023 International Conference on Informatics, Multimedia, Cyber and Informations System (ICIMCIS)*, 369–373. https://doi.org/10.1109/ICIMCIS60089.2023.10349017

Syahputra, A., Diana, A., & Achadiani, D. (2024). PENERAPAN METODE ANALYTICAL HIERARCHY PROCESS DAN SIMPLE ADDITIVE WEIGHTING UNTUK PEMILIHAN SUPPLIER TOKO BERAS. *IDEALIS : InDonEsiA JournaL Information System*, *7*(2 SE-Table of Content). https://doi.org/10.36080/idealis.v7i2.3169

Tešić, D., Radovanović, M., Božanić, D., Pamucar, D., Milić, A., & Puška, A. (2022). Modification of the DIBR and MABAC Methods by Applying Rough Numbers and Its Application in Making Decisions. *Information*, *13*(8), 353. https://doi.org/10.3390/info13080353

Ulutaş, A., Balo, F., & Topal, A. (2023). Identifying the Most Efficient Natural Fibre for Common Commercial Building Insulation Materials with an Integrated PSI, MEREC, LOPCOW and MCRAT Model. *Polymers*, *15*(6), 1500. https://doi.org/10.3390/polym15061500