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Decision Support System to Evaluate Employee Performance Using the MABAC Method with ROC Weighting (Case Study at the UPPD/Samsat Office of Purworejo Regency)

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Abstract

The Decision Support System is applied in this study as a system to recommend applications to evaluate the performance of all employees or employees at the UPPD/Samsat Purworejo Regency office. The purpose of holding this research activity is to determine or evaluate the performance of employees or employees who are the best and the right ones must meet criteria such as Work Quality, Punctuality, Initiative, Teamwork, Integrity, and Skill Improvement. Therefore, a Decision Support System (SPK) is needed to solve the existing problem by applying the MABAC (Multi-Attributive Border Approximation area Comparison) method with Rank Order Centroid (ROC) weighting which can produce preference values from the alternatives that are ranked first. So it is hoped that this decision support system will be obtained from the performance results of all employees at the UPPD/Samsat Purworejo Regency office, which employees need to be fostered or given warnings to be better at working to serve the community in order to fulfill their obligations as citizens, namely paying their motor vehicle taxes.

Keywords: Decision Support System, Performance Evaluation, Best Performance, MABAC Method, ROC Method

INTRODUCTION

The One-Stop Manunggal Administration System or often known in the community as SAMSAT is a combination of three agencies, namely the National Police, the Regional Revenue Management Agency (BAPENDA) of Central Java Province, and Jasa Raharja, which serves the community in the payment of Motor Vehicle Tax (PKB) (Wang et al., 2021). The Regional Revenue Management Agency (BAPENDA) has technical implementing elements in the Central Java Region, one of which is the Regional Revenue Management Unit (UPPD) of Purworejo Regency. According to Sukmawati et al. (2020), UPPD Purworejo Regency is an element of implementing operational technical tasks and/or certain supporting technical activities in the field of regional revenue services. It is led by the Head of the Unit, who is located under and responsible to the Head of the Provincial Regional Revenue Management Agency of Central Java (Hidayati & Putra, 2021). The role of local government agencies in improving regional revenue collection is

crucial, as indicated by a study from Kumar et al. (2022), which highlights the importance of effective local governance in increasing tax compliance. According to Putra & Ibrahim (2022), collaboration among governmental entities is essential in achieving transparency and efficiency in tax collection. Moreover, SAMSAT's success in improving tax compliance can be attributed to its streamlined processes and user-friendly systems, as discussed by Liu et al. (2021). Furthermore, the integration of different agencies such as BAPENDA and Jasa Raharja significantly contributes to operational effectiveness and customer satisfaction (Zhao & Li, 2023). Finally, research by Li et al. (2021) shows that systems like SAMSAT, which simplify administrative processes, positively influence public perception and encourage greater public participation in tax payments.

Human UPPD Purworejo Regency is located on Jl. Jenderal Sudirman No. 17 Purworejo and serves Taxpayers in 16 Districts including: Bruno District, Pituruh District, Kemiri District, Bayan District, Butuh District, Kutoarjo District, Ngombol District, Grabag District, Bener District, Gebang District, Loano District, Purworejo District, Banyuurip District, Kaligesing District, Bagelen District and Purwodadi District (Bapenda.jatengprov.go.id, 2022). For the sake of achieving the motto of *UPPD/SAMSAT*, namely "Your satisfaction is the image of our service," it cannot be separated from the role of employees/leaders in the agency, ensuring that the image of good service continues to be maintained. Therefore, the performance factor of employees is very important and must be prioritized in order to produce good and optimal service to the community.

resources or employees are one of the important factors in the running of an organization/company (Nur Cahyadi, 2023). In companies or agencies with a large number of employees, the process of evaluating (assessing) the performance of employees is relatively often carried out, so companies need a standard procedure in setting requirements for an employee, who is measured by their performance and selected to be an outstanding employee. Some of the problems that occur during the employee performance evaluation process include subjectivity in performance appraisal, especially if several existing employees have abilities (and based on other considerations) that are not much different (Wibowo & Wening, 2023).

This study was conducted to overcome these limitations by proposing an innovative performance evaluation model using the Multi-Attributive Border Approximation Area Comparison Method (MABAC) (Safitri et al., 2023) and enriched with Rank Order Centroid (ROC) weighting, which has not been explored much in the literature before (Utomo & Ginting, 2023). Decision Support Systems are useful to help decision-making in overcoming structured and semi-structured problems to be more effective by using analysis models and available data (Widodo et al., 2024).

This research aims to develop a performance evaluation model that is reliable and also easily adapted to the specific needs of the relevant agencies. Addressing these issues is essential to ensure that organizations can effectively assess and improve their performance in a competitive environment, as well as facilitate better data-driven decision-making (Nailiu et al., 2024) . This study also aims to integrate the MABAC method with the Rank Order Centroid (ROC) weighting approach. ROC is a method for determining the relative weight of criteria in decision-making (Widodo et al., 2024)

The proposed model will use an innovative MABAC approach, combined with ROC

weighting techniques to create a more holistic and adaptive evaluation framework (Utomo & Ginting, 2023). This research was conducted to offer practical and theoretical solutions to the shortcomings in current performance evaluation methods, as well as to enrich the literature in the field of performance management. The study will use a quantitative approach, analyzing data from various industries to validate the effectiveness of the proposed model (Widodo et al., 2024)

MABAC and ROC methods, while not new, have not been widely integrated in the context of performance evaluation. The main difference in this study is the incorporation of MABAC with ROC in the performance evaluation model, allowing for a more comprehensive and dynamic assessment. This research will apply the proposed model and is expected to generate and provide new insights into performance evaluation and organizational management.

RESEARCH METHODS

The following are the materials and methods used in this study, namely:

The stages of the research can be seen in the image below;

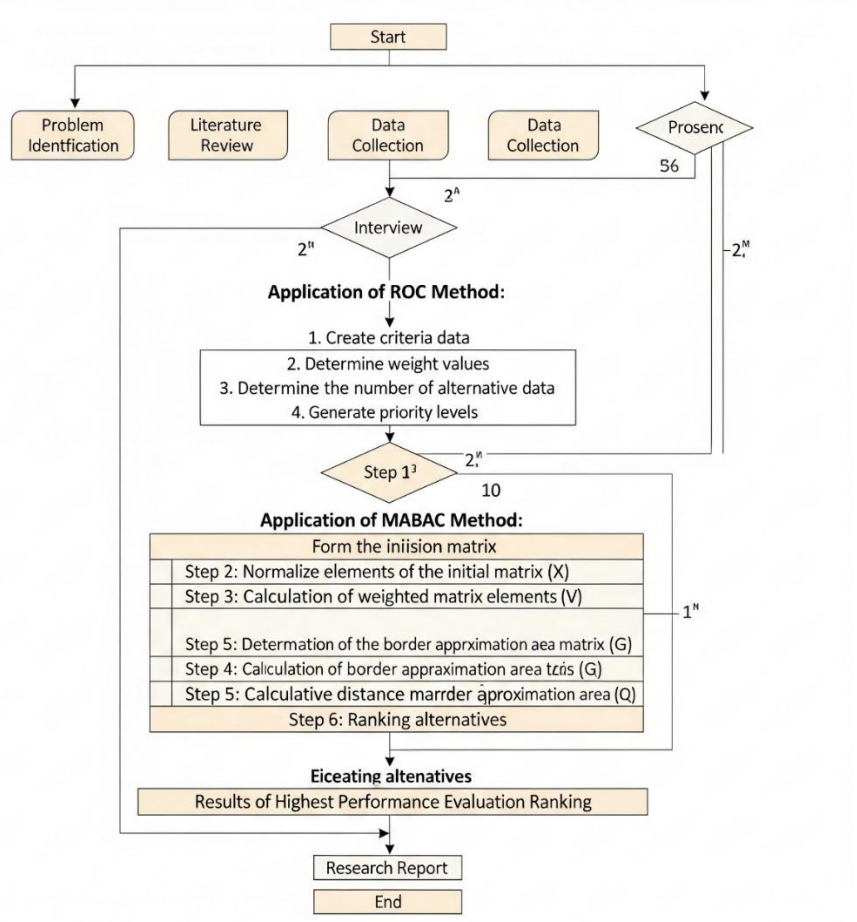

Figure 1. Research Stages

From the steps in the study shown in **Figure 1**, it serves as a guide in carrying out research with the intention of solving the issues faced and producing a research report that displays the

findings of the results (M. Afdhal Chatra P, 2023). The stages carried out in this study include the following steps:

a. *Problem Identification*: This is the initial stage in which the research problem is identified (Kraugusteeliana et al., 2023). From the results of interviews and discussions during the study of street vendors and continued in this study, namely the implementation of performance evaluation, performance evaluation is only based on office attendance, in the form of a lack of objectivity and efficiency in the existing performance evaluation system.
b. *Literature Review*: At this stage, the existing literature related to the research topic is reviewed to gather relevant information and insights (Ramdhan, 2021).
c. *Determination of Criteria and Alternatives*: This stage includes the determination of criteria and alternatives to be evaluated using the *MABAC* method.
d. *Data Collection*: This stage involves collecting the necessary data that will be used in the evaluation process (Ramdhan, 2021).
e. *Weighting with ROC*: The *Rank Order Centroid* (ROC) method is used for weighting criteria. ROC was chosen because of its fairly simple application, according to the priority level of the criteria used (Utomo & Ginting, 2023). The ROC method is used to calculate the weighted value of the criteria, and the *MABAC* method is used to rank alternatives based on performance criteria, namely: Quality of Work, Punctuality, Initiative, Teamwork, Communication, Skill Improvement, Innovation and Creativity, and Integrity.
f. *Application of the MABAC Method*: At this stage, the *MABAC* method is applied to evaluate alternatives based on predetermined criteria and weights. The *MABAC* method is a multi-criteria analysis and comparison method. Compared to other multi-criteria decision-making methods, this method was chosen because it provides consistent and reliable answers for rational decision-making (Alpan et al., 2024). *MABAC* is a stable, consistent, and reliable multi-criteria comparison method, allowing it to produce recommendations based on criteria (Alpan et al., 2024). Therefore, the *MABAC* method was chosen by the author to make it easier to assess the performance of employees in *UPPD/Samsat Purworejo Regency*.
g. *Performance Evaluation*: This stage includes performance appraisal based on the results of the *MABAC* method.
h. *Report Preparation*: This stage includes compiling the findings and analysis of the research into a comprehensive report.
i. *Presentation of Research Results*: Finally, the results and conclusions of the research are presented (Ramdhan, 2021).

Decision Support System

The *Decision Support System* (SPK) is a system that is empowered in handling problems and communicating in structured to unstructured situations, functioning as a support in problem-solving without determining specific decisions that must be taken. The purpose of SPK is to present predictions, provide information, and guide users in making more efficient and effective decisions. The SPK application utilizes a flexible, interactive, and adaptable *Computer-Based Information*

System (CBIS), specifically designed to support the handling of complex management problems. This application processes data, provides a user-friendly interface, and facilitates the integration of decision-makers' thought processes (Widodo et al., 2024).

ROC (Rank Order Centroid) Method

ROC is an analysis method used to evaluate the level of significance or elimination weight for various criteria. To make the right decision, it is important to set the ideal weight for the predetermined criteria. The *ROC* method in particular focuses on determining the order of priority of the criteria that are considered crucial. In this study, the determination of weights for each criterion was carried out through the application of the *ROC* method (Utomo & Ginting, 2023). The following are the calculation steps carried out:

a. Jika $C_1 > C_2 > C_3 > C_4 > \cdots > Cn$ maka $W_1 > W_2 > W_3 > W_4 > \cdots > W_n$ (1)

b. Menghitung nilai bobot kriteria (Wm)

$$Wm = \frac{1}{m}\sum_{i=1}^{m}\left(\frac{1}{1}\right) \quad (2)$$

MABAC (Multi Attributive Border Approximation Area Comparison) method, MABAC method was developed by Pamucar and Cirovic. The core concept of the MABAC method is reflected in the definition of the function distance criterion of each observed alternative from the approximate boundary area. In the next section, the procedure for applying the MABAC method is described, which is a mathematical approach consisting of 6 steps [1], [6], [7], as follows:

1. Step 1: Forming initial decision matrix (X)) In the first step, an alternative evaluation of "m" with "n" criteria is carried out. The alternative is presented with the vector Ai = (Xi1, Xi2, Xi3, ..., xin), where xij is the value of the "i" alternative with the criterion "j" (i = 1, 2, 3, 4, ..., m; j = 1, 2, 3, 4, ..., n). Where m is an alternate number, n is the total sum of the criteria.
2. Step 2: Normalization of initial matrix (X)) elements) The normalized matrix element (N) is obtained by applying the formula:
   1) Jenis kriteria Benefit *(For benefit-type criteria)*

$$Tij\frac{Xij-Xi^{-}}{Xi^{+}-Xi^{-}} \quad (3)$$

   2) Jenis kriteria Cost *(For cost-type criteria)*

$$Tij\frac{Xij-Xi^{-}}{Xi^{-}-Xi^{-}} \quad (4)$$

3. Step 3 : Calculation of weighted matrix (V) elements

$$Vij = (wi * tij) + wi \quad (5)$$

4. Step 4 : Determination of border approximate area matrix (G) The approximate area of the boundary for each criterion is determined according to the formula:

$$\left[\prod_{j=1}^{m} Vij\right]^{1/m} \quad (6)$$

5. Step 5: Calculation of matrix elements of alternative distance from the border approximate area (Q)).

$$Qij = Vij - Gi \quad (7)$$

6. Step 6: Alternative ranking is done by adding each criterion element of each alternative based on the alternative distance matrix of the approximate border area (Q).

$$Si = \sum_{j=1}^{n} qij, j = 1,2,3 \ldots, m \quad (8)$$

RESULT AND DISCUSSION

Analysis of the Application of Methods

In the Analysis and Application of this Method, the researcher will explain how this case can be solved using the MABAC method with ROC Weighting from the beginning to the end of the ranking process. Based on the research that has been conducted by the author, it can be found that there are problems in evaluating employee performance at the UPPD/Samsat Office of Purworejo Regency. The application of the MABAC method with ROC weighting is a stage carried out for calculation in decision-making on performance assessment of employees of the Purworejo Regency UPPD/Samsat Office based on alternative data and criteria obtained from the Purworejo Regency UPPD/Samsat Office.

Alternative Data and Criteria

The alternative data used in this research were 5 data. Alternative data is candidate data that will be evaluated for performance. The alternative data can be seen in table 1. Below :

Table 1. Alternative Data

Yes	Alternative	Name	Gender
1	A1		
2	A2		
3	A3		
4	A4		
5	A5		

Determining which criteria to be the alternatives to be evaluated is one of the most important segments of decision-making. The performance evaluation criteria that have been set can be seen in the table as follows:

Table 2. Criteria Data

Criterion	Information	Kind
C1	Quality of Work	Benefit
C2	Timeliness	Benefit
C3	Initiatives	Benefit
C4	Teamwork	Benefit
C5	Integrity	Benefit
C6	Upskilling	Benefit

Application of the ROC Method

In this study, there is no weight value in the criteria data, so the author uses the ROC method to produce a weight value. The following is how to calculate the weighting value using the formula in the ROC steps, for more details can be seen below:

$$W1 = \frac{1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}}{6} = 0{,}408$$

$$W2 = \frac{0 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}}{6} = 0{,}241$$

$$W3 = \frac{0 + 0 + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}}{6} = 0{,}158$$

$$W4 = \frac{0 + 0 + 0 + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}}{6} = 0{,}103$$

$$W5 = \frac{0 + 0 + 0 + 0 + \frac{1}{5} + \frac{1}{6}}{6} = 0{,}061$$

$$W6 = \frac{0 + 0 + 0 + 0 + 0 + \frac{1}{6}}{6} = 0{,}027$$

Based on the calculation with the ROC method above, the expected criteria weights were obtained, namely W1= 0.408, W2= 0.241, W3= 0.158, W4= 0.103, W5= 0.061, W6= 0.027.

Table 3. Criterion weights

Criterion	Information	Jenis	Value Weight
C1	Quality of Work	Benefit	0,408
C2	Timeliness	Benefit	0,241
C3	Initiatives	Benefit	0,158
C4	Teamwork	Benefit	0,103
C5	Integrity	Benefit	0,061
C6	Upskilling	Benefit	0,027
	Sum	Benefit	1

Determination of Paired Relationships Each alternative data and criteria data Paired relationships are alternative compatibility data for each criteria that have been determined for decision-making in the evaluation of employee performance at the UPPD/Samsat Office of Purworejo Regency in this study can be seen in table 4. below:

Table 4. Paired relationships of each alternative data and criterion data

Alternative	Quality of Work (C1)	Punctuality (C2)	Initiatives (C3)	Teamwork (C4)	Integrity (C5)	Skill Enhancement (C6)
A1	Good	Quite Precise	Excellent	Good	Excellent	Good
A2	Pretty good	On time	Pretty Good	Good	Good	Pretty good
A3	Good	Very Precise	Excellent	Less good	Excellent	Pretty good
A4	Excellent	Very Precise	Good	Good	Pretty good	Good

Alternative	Quality of Work (C1)	Punctuality (C2)	Initiatives (C3)	Teamwork (C4)	Integrity (C5)	Skill Enhancement (C6)
A5	Excellent	On time	Good	Pretty good	Excellent	Excellent

In table 4. The data sample cannot be processed because the data type is still linguistic, so a weight correction process is needed for the six criteria. Here's a table of weight corrections used.

Table 5. Improvement of Criterion Weights

Criteria Code	Information	Value
C1, C3, C4, C5, C6	Excellent	4
	Good	3
	Pretty Good	2
	Not Good	1
C2	Very Precise	4
	On time	3
	Quite Precise	2
	Less Accurate	1

From the results of table 5, adjustments can be made between the data sample in table 4 and table 5 weight correction so that it will form a new table called table 6 match rating data, where the data has been matched and can be processed with the method to be applied.

Table 6. Improvement of Criterion Weights

Alternative	(C1)	(C2)	(C3)	(C4)	(C5)	(C6)
A1	3	2	4	3	4	3
A2	2	3	2	3	3	2
A3	3	4	4	1	4	2
A4	4	4	3	3	2	3
A5	4	3	3	2	4	4

Application of the MABAC Method

The MABAC method was developed by Pamucar and Cirovic, the basic assumption of the MABAC method is reflected in the definition of the distance criterion of each observed alternative from the approximate boundary area. The determination of the MABAC method is carried out to produce a ranking on each alternative. The calculation is carried out when the weight value has been obtained for each criterion, the calculation steps of the MABAC method are as follows:

1) Preliminary results matrix

$$X = [Xij] = \begin{bmatrix} 3 & 2 & 4 & 3 & 4 & 3 \\ 2 & 3 & 2 & 3 & 3 & 2 \\ 3 & 4 & 4 & 1 & 4 & 2 \\ 4 & 4 & 3 & 3 & 2 & 3 \\ 4 & 3 & 3 & 2 & 4 & 4 \end{bmatrix}$$

2) Normalization of Initial Decision Matrix Elements (X)
At this stage, the normalization of the elements of the initial decision matrix is calculated based on the numerical value obtained from each element in the initial decision matrix table using equation (2).

C1 (Kualitas Kerja)

$$U1.1 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U1.2 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U1.3 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U1.4 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U1.5 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$

C2 (Ketepatan Waktu)

$$U2.1 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U2.2 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U2.3 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U2.4 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U2.5 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$

C3 (Inisiatif)

$$U3.1 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U3.1 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U3.1 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U3.1 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U3.1 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$

C4 (Kerjasama Tim)

$$U4.1 = \frac{(3-1)}{(4-1)} = \frac{2}{3} = 0{,}66$$
$$U4.2 = \frac{(3-1)}{(4-1)} = \frac{2}{3} = 0{,}66$$
$$U4.3 = \frac{(1-2)}{(4-1)} = \frac{1}{3} = 0{,}33$$
$$U4.4 = \frac{(3-1)}{(4-1)} = \frac{2}{3} = 0{,}66$$
$$U4.5 = \frac{(2-1)}{(4-1)} = \frac{1}{3} = 0{,}33$$

C5 (Integritas)

$$U5.1 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U5.2 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U5.3 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$
$$U5.4 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U5.5 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 0$$

C6 (Peningkatan Keterampilan)

$$U6.1 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U6.2 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U6.3 = \frac{(2-2)}{(4-2)} = \frac{0}{2} = 0$$
$$U6.4 = \frac{(3-2)}{(4-2)} = \frac{1}{2} = 0{,}5$$
$$U6.5 = \frac{(4-2)}{(4-2)} = \frac{2}{2} = 1$$

Based on the results of the calculation above, the normalized matrix is obtained as follows:

$$X = \begin{bmatrix} 0{,}5 & 0 & 1 & 0{,}66 & 1 & 0{,}5 \\ 0 & 0{,}5 & 0 & 0{,}66 & 0{,}5 & 0 \\ 0{,}5 & 1 & 1 & 0{,}33 & 1 & 0 \\ 1 & 1 & 0{,}5 & 0{,}66 & 0 & 0{,}5 \\ 1 & 0{,}5 & 0{,}5 & 0{,}33 & 0 & 1 \end{bmatrix}$$

3) The calculation of the weighted matrix element (V) at this stage is calculated to determine the affected matrix using a compress (5)

C1 (Kualitas Kerja)	C2 (Ketepatan Waktu)
V1.1 = (0,408 * 0,5) + 0,408 = 0,612	V2.1 = (0,241 * 0) + 0,241 = 0.241
V1.2 = (0,408 * 0) + 0,408 = 0.408	V2.2 = (0,241 * 0,5) + 0,241 = 0.362
V1.3 = (0,408 * 0,5) + 0,408 = 0,612	V2.3 = (0,241 * 1) + 0,241 = 0.482
V1.4 = (0,408 * 1) + 0,408 = 0,816	V2.4 = (0,241 * 1) + 0,241 = 0.482
V1.5 = (0,408 * 1) + 0,408 = 0,816	V2.5 = (0,241 * 0,5) + 0,241 = 0.362
C3 (Inisiatif)	C4 (Kerjasama Tim)
V3.1 = (0,158 * 1) + 0,158 = 0,316	V4.1 = (0,103 *0,66) + 0,103 = 0,171
V3.2 = (0,158 * 0) + 0,158 = 0,158	V4.2 = (0,103 *0,66) + 0,103 = 0,171
V3.3 = (0,158 * 1) + 0,158 = 0,316	V4.3 = (0,103 *0,33) + 0,103 = 0,137
V3.4 = (0,158 * 0,5) + 0,158 = 0,237	V4.4 = (0,103 *0,66) + 0,103 = 0,171
V.3.5 = (0,158 * 0,5) + 0,158 = 0,237	V4.5 = (0,103 *0,33) + 0,103 = 0,137
(C5) Integritas	(C6) Peningkatan Keterampilan
V5.1 = (0,061 * 1) + 0,061 = 0.122	V6.1 = (0,027 * 0,5) + 0,027 = 0,041
V5.2 = (0,061 * 0,5) + 0,061 = 0.092	V6.2 = (0,027 * 0) + 0,027 = 0,027
V5.3 = (0,061 * 1) + 0,061 = 0.122	V6.3 = (0,027 * 0) + 0,027 = 0,027
V5.4 = (0,061 * 0) + 0,061 = 0.061	V6.4 = (0,027 * 0,5) + 0,027 = 0,041
V5.5 = (0,061 * 0) + 0,061 = 0.061	V6.5 = (0,027 * 1) + 0,027 = 0,054

The normalization calculation of the alternative weighted matrix P2 to P8 is carried out like P1. After all calculations are carried out on alternatives P2 to P8, the results of the weighted matrix normalization value data are obtained which can be seen in Table 7.
Based on the results of the calculation above, the following matrix is obtained:

Alternatif	C1	C2	C3	C4	C5	C6
A1	0,612	0,241	0,316	0,171	0,122	0,041
A2	0,408	0,362	0,158	0,171	0,092	0,027
A3	0,612	0,482	0,316	0,137	0,122	0,027
A4	0,816	0,482	0,237	0,171	0,061	0,041
A5	0,816	0,362	0,237	0,137	0,061	0,054

Table 7. Weighted matrix data (V)

4) Determining the value of the boundary approximate area matrix (G)
Multiply the value on each of the same criteria, then the total multiplication is then multiplied by one per alternate number with the equation formula (6)
G.C1 = (0.612 * 0.408 * 0.612 * 0.816 * 0.816) 0.2 = 0.633
G.C2 = (0.241 * 0.362 * 0.482 * 0.482 * 0.362) 0.2 = 0.374
G.C3 = (0.316 * 0.158 * 0.316 * 0.237 * 0.237) 0.2 = 0.245
G.C4 = (0.171 * 0.171 * 0.137 * 0.171 * 0.137) 0.2 = 0.156

G.C5 = (0.122 * 0.092 * 0.122 * 0.061 * 0.061) 0.2 = 0.087
G.C6 = (0.041 * 0.027 *0.027 * 0.041 * 0.054) 0.2 = 0.036

	C1	C2	C3	C4	C5	C6
G	0,633	0,374	0,245	0,156	0,087	0,036

Calculation of the alternative distance matrix element of the approximate boundary area (Q) Determine the value of the alternative boundary distance matrix element based on the approximate boundary area matrix (G), using the equation formula (7)

C1 (Quality of Work)	C2 (Punctuality)
Q1.1 = 0,612 – 0,633 = -0,021	Q2.1 = 0,241 – 0,374 = -0.133
Q1.2 = 0,408 – 0,633 = -0,225	Q2.2 = 0,362 – 0,374 = -0.012
Q1.3 = 0,612 – 0,633 = -0,021	Q2.3 = 0,482 – 0,374 = 0.108
Q1.4 = 0,816 – 0,633 = 0,183	Q2.4 = 0,482 – 0,374 = 0.108
Q1.5 = 0,816 – 0,633 = 0,183	Q2.5 = 0,362 – 0,374 = -0.012

The calculation of alternative distances from P2 to P8 is carried out like P1. After all calculations are carried out on alternatives P2 to P8, the results of the alternative distance value data can be seen in Table 8.

Table 8. Alternative Distance Matrix Value Data

Alternative	C1	C2	C3	C4	C5	C6
A1	-0.021	-0.133	0.071	0.015	0.035	0.004
A2	-0.225	-0.012	-0.087	0.015	0.004	-0.009
A3	-0.021	0.108	0.071	-0.019	0.035	-0.009
A4	0.183	0.108	-0.008	0.015	-0.026	0.004
A5	0.183	-0.012	-0.008	-0.019	-0.026	0.018

5) Alternative rankings

It is done by adding each element of the criteria of each alternative based on the alternative distance matrix of the approximate border area (Q).

A1 = (-0.021) + (-0.133) + 0.071 + 0.015 + 0.035 + 0.004 = -0.030
A2 = (-0.225) + (-0.012) + (-0.087) + 0.015 + 0.004 + (-0.009) = -0.316
A3 = (-0.021) +0.108 + 0.071 + (-0.019) + 0.035 + (-0.009) = 0.163
A4 = 0.183 + 0.108 + (-0.008) + 0.015 (-0.026) + 0.004 = 0.275
A5 = 0.183 + (-0.012) + (-0.008) + (-0.019) + (-0.026) + (0.018) = 0.134

Based on the results of the calculation using the MABAC method with ROC weighting in the performance evaluation of UPPD/Samsat employees, the best score that can be seen in Table 9 is the A4 alternative with a value of 0.275 as the employee with the highest score.

Table 9. Ranking Results

Alternative	Name	Result	Ranking
A1		-0.030	5
A2		-0.316	4
A3		0.163	2
A4		0.275	1
A5		0.134	3

CONCLUSION

From this study, the author concludes that the *MABAC* method can be implemented in evaluating employee performance with criteria that meet the standards, such as Work Quality, Punctuality, Initiative, Teamwork, Integrity, and Skill Improvement. This method can provide recommendations for employees with the best performance, based on the highest final results obtained, namely in the *A4* alternative, under the name XXXXXXXX, with a value of 0.275. Therefore, the leaders of the *UPPD/Samsat Purworejo Regency* Office can follow up on the results of the performance evaluation by giving awards and providing coaching or development to employees who have the lowest performance scores.

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