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Animal Caregiver Selection by Applying ARAS Method Decision Support System and Entropy Weighting

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Abstract−Animal care is a profession that is responsible for taking good care of animals or checking the condition of animals for the purpose of animal health. To get a qualified animal care worker according to the company's needs, it takes quite a long time, because animal care workers who apply for a job at a company must first go through several tests in order to meet the criteria required by the company. So that animal care workers are needed and required to care for animals, maintain their health and pay attention to the nutrition of the animals. So that there is no extinction of protected animals. The current animal care worker acceptance procedure in the wildlife park is that applicants submit identity files, if they pass the applicant's files, they take an interview test and the last test, the applicant must practice in the field directly to find out how well the applicant is able to adapt to animals. In calculating the value, problems often occur in this acceptance process. A decision support system (DSS) is an interactive information system that provides information, modeling, and data manipulation. In this case, the author uses the Entropy method and the ARAS (Additive Ratio Assessment) method to solve it. The Entropy method can be used to calculate weights based on data characteristics in the criteria, the higher the variation between data in the criteria, the higher or more important the weight of the criteria. While the ARAS (Additive Ratio Assessment) method is used for ranking. The use of the Entropy method as a weighting aims to ensure that the weighting process is carried out based on objective value assignment. In the application of the Entropy Method, a weighting of the criteria value is produced where the criteria with the highest to lowest values are Certificate, Work Experience, Age, Interview and Education with the highest value being 0.768 and the lowest being 0.021. Then the process of applying the selection of animal nurses using the ARAS method obtained the result that alternative A1 was selected as an animal nurse with a value obtained of 0.0816.

Keywords: Selection; Animal Nurse; Decision Support System; ARAS Method; Entropy Method Weighting

1. INTRODUCTION

Animal caretakers are a profession that is responsible for taking good care of animals or checking the condition of animals for the purpose of animal health. Animal caretakers are professionals who work by carrying out a wide scope of tasks every day from feeding animals, cleaning cages and show areas, paying attention to health, and providing vitamins. For this reason, animal caretakers must also be trained and their abilities developed in order to provide good performance and quality according to the company's needs. To get a qualified animal caretaker according to the company's needs, it takes quite a long time, because animal caretakers who apply for jobs at a company must first go through several tests in order to meet the criteria required by the company.

Wildlife Parks are fun family recreation places, they can also be educational tourist attractions, especially for children because visitors can see directly various types of animals that may have only been seen on television or books. Animals are animals that must be protected. However, due to the poor maintenance of the Wildlife Park, various problems and issues including the death of hundreds of animals, the death of hundreds of animals especially due to disease, lack of adequate facilities and qualified and professional animal care workers in their fields. Therefore, animal caretakers are very much needed and required to care for animals, maintain health and pay attention to nutrition in these animals. In order to prevent extinction of protected animals.

The procedure for accepting animal nurses that is currently running in the wildlife park is that applicants submit identity documents, if they pass the applicant's files, they take an interview test and the last test, applicants must practice in the field directly to find out how well the applicant is able to adapt to animals. Acceptance of animal nurses is taken through a selection process and passes a predetermined test such as taking a practical test. All the results of each test that is carried out will be calculated as a whole to get the final score for each animal nurse applicant.

In calculating the score, problems often occur in this acceptance process, caused by several factors, one of which is the misuse of authority by the related employees. To avoid subjective (fraudulent) decisions made, a Decision Making System (DSS) is needed to assist in deciding which animal nurses will be accepted[1], [2].

A decision support system (DSS) is an interactive information system that provides information, modeling, and data manipulation. DSS is usually built to support a solution to a problem or to evaluate an opportunity. The decision support system itself is a process that is often used in the process of solving problems that have various attribute values. In the resolution process used in decision support systems, there are various methods that can be used[3], [4], [5].

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In this case, the author uses the Entropy method and the ARAS (Additive Ratio Assessment) method to solve it. The Entropy method can be used to calculate the weight based on the characteristics of the data on the criteria, the higher the variation between the data on the criteria, the higher the weight of the criteria or the more important it is. Meanwhile, the ARAS (Additive Ratio Assessment) method is used for ranking[6], [7].

The use of the Entropy method as a weighting aims to ensure that the weighting process is carried out based on objective value assignment. The assignment of weight values to the criteria greatly influences the results of the selection process carried out. Therefore, it is necessary to pay attention to the weighting process carried out in order to obtain maximum results and in accordance with the objectives of the selection[8], [9].

As a supporter in the research process, supporting research is needed, such as that conducted by Puspa Citra, et al. in 2024 with the research title Decision Support System for E-Commerce Selection Using Entropy and COPRAS Weighting. From the research results, it was found that using the Entropy method can help in optimizing the selection[10].

Further research was conducted by Nola Dita Puspa, et al. in 2023 with the title of the research on the Application of the MAUT Method with Entropy Weighting in the Decision Support System for the Performance Assessment of Honorary Teachers from the research process carried out that by providing weighted values using the Entropy Method, it helps in providing objective results[11].

The third supporting study was conducted by Ahyuna et al. in 2023 where the title of the study was Analysis of the Application of the MABAC Method with Entropy Weighting in Lecturer Performance Assessment in the Society 5.0 Era and the results obtained by applying the Entropy Method to the criteria weighting can find accurate results[12].

The latest research used as research support was conducted by Ade Surahman in 2024 with the research title Employee Performance Assessment Using a Combination of the Multi-Objective Optimization by Ratio Analysis (MOORA) Method and Entropy Weighting with the results obtained entropy weighting helps in facilitating the assignment of uncertainty values to the criteria[13].

The ARAS (Additive Ratio Assessment) method is one of the methods in the Decision Support System (DSS) which is used to determine the best alternative based on the given criteria. ARAS works by calculating the total score of each alternative through a normalization process and ratio calculation by considering the weight of the criteria[14], [15], [16].

The first research as a support for research conducted by Hendrik Kurniawan Ginting, et al. in 2024 with the research title Decision Support System for Determining Betta Fish with High Sales Value Using the Aras (Additive Ratio Assessment) Method, where in the process carried out, the results were obtained by applying the ARAS method, ranking results were obtained for selection[17].

Further research used as support was conducted by Yogie Indra Pradana, et al. in 2024 with the title of the study Application of the Additive Ratio Assessment (ARAS) Method in Supporting Store Head Recruitment Decisions, where the results obtained by applying the ARAS method obtained 3 (three) priorities for being selected as store head[18].

The next research was conducted by Mursalim Tonggiroh, et al. in 2024 with the research title Decision Support System for Selecting Wireless Routers Using the Rank Reciprocal Approach and ARAS and the results of the research showed that the best utility value was obtained after applying the ARAS Method with a value of 0.8999[19].

The latest research was conducted by Muhammad Baihaqi and Harunur Rosyid in 2024 with the research title Teacher Performance Assessment System Using the Additive Ratio Assessment (ARAS) Method (Case Study of Mi Darul Ulum Benem) with the results of the research showing that using the ARAS method can help simplify the teacher performance assessment system[20].

Based on several previous studies that have been conducted previously, the research that will be conducted by improving the weighting process for the criteria used in the selection process. The weighting process is carried out using the Entropy Weighting Method. The weighting process aims to obtain the weight value for each criterion optimally. From the explanation above, in this study the author will apply the Entropy and ARAS (Additive Ratio Assessment) methods which are expected to provide the best results in accepting animal nurses at the Wildlife Park by considering the criteria that have been determined by the company.

2. RESEARCH METHODOLOGY

2.1 Research Stages

In the research stages below, the flow of the research stages and the data collection process carried out are as follows:

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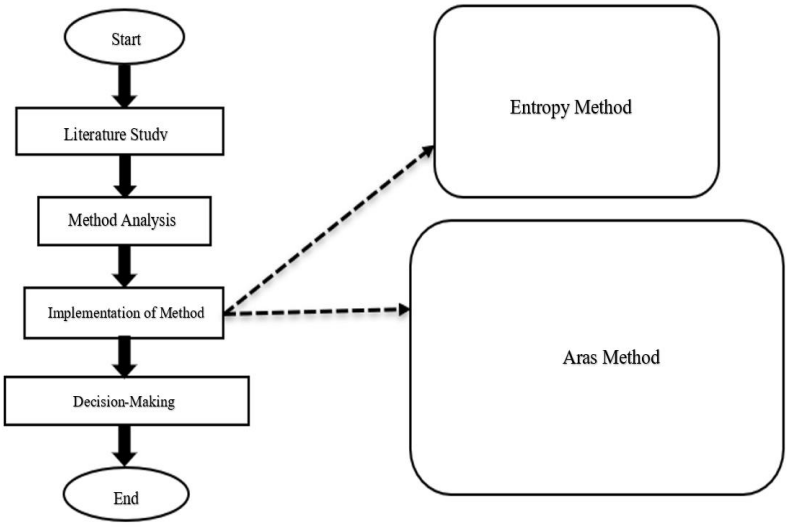

Figure 1. Research Stages

In Figure 1 you can see all the stages that are gone through in the research starting from the literature study to the decision-making process.

2.2 Decision Support System

Basically, decision making is a process to reach a conclusion which is preceded by a series of considerations which result in choosing one possibility and setting aside other possibilities. Decision making carried out by the subject begins with the first step, the first step is identifying the goal[21].

Decision making is often faced with the complexity and difficulty of many scope factors and with the amount of data available. For the sake of decision making, most make a decision by considering many things from the ratio of benefits or costs, faced with a certain requirement to be able to expect a system and can be relied on to solve problems effectively and efficiently and from that it is called a Decision Support System (DSS)[22].

In general, a decision support system (DSS) or Decision Support System is a specific information system that is intended to help management in making decisions related to semi-structured problems. This system has facilities to produce various alternatives that are interactively used by users[23].

2.3 Entropy Method

The Entropy method is a weighting method, Entropy can be applied to weight attributes. Using the Entropy method, the criteria with the highest value variation will get the highest weight. The Entropy method is quite powerful for calculating the weight of a criterion. The reason is because this method can be used for various types of data, both quantitative and qualitative. In addition, this method also does not require that the units or ranges of each criterion must be the same. This is possible because before being processed, all data will be normalized first so that it will have a value between 0-1. Basically, data that has a large range of values (relative to the criteria themselves) and has a high variation in values to distinguish the performance of each alternative. Algorithms in solving Decision Support Systems (DSS) with the Entropy method include the following[24], [25], [26]:

a. Determine the initial data
   Each decision maker assigns values according to his/her references which highlight the importance of a particular criterion.
b. Normalization of initial data
   Subtract each criterion value from the most ideal value, the result of the reduction is statedn k_{ij}.
c. Determine the matrix value (a_{ij})

$$a_{ij} = \frac{K_{ij}}{\sum_{i=1}^{m}\sum_{j=1}^{n} K_{ij}} \quad (1)$$

   In this formula, we can see the global normalization form for the K_{ij} matrix elements, namely a_{ij} = results of calculation of criteria data matrix. k_{ij} = value of each criterion from the initial data normalization. i = Respondent to 1,2,...i. j = criteria to 1,2,...j. m = number of decision makers and n = number of criteria
d. Calculation of entropy values for each criterion.

$$E_j = \left[\frac{-1}{\ln m}\sum_{i=1}^{m}\left[a_{ij}\ln(a_{ij})\right]\right] \quad (2)$$

   E_j = entropy weight value and Ln = log value of total decision making.
e. Calculation of dispersion for each criterion.

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$$D_j = 1 - E_j \quad (3)$$

D_j = entropy dispersion value.

f. Normalization of dispersion values.

$$Wj = \frac{D_j}{\sum D_j} \quad (4)$$

Wj = normalized dispersion value (criteria priority weight)

2.4 ARAS Additive Ratio Assessment Method

According to Stanujkic and Jovanovic, the ARAS method was developed by Zavadskas and Turskis in 2010. The ARAS method is one of the multicriteria decision-making methods. Based on the concept of using utility degree, namely by comparing the overall index value of each alternative to the overall index value of the optimal alternative. The algorithm in solving the Decision Support System (DSS) with the ARAS method has 5 stages that must be carried out, as follows[27], [28], [29]:

a. Formation of Decision Making Matrix (DDM)

$$X=\begin{bmatrix} X_{01} & \cdots & X_{0j} & \ldots & X_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{i1} & \ldots & X_{ij} & \ldots & X_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{n1} & \ldots & X_{mj} & \ldots & X_{mn} \end{bmatrix} \; i = 0,m; \quad j = 1,n \quad (5)$$

In the formula above, it can be seen m = Alternative Number. n = Number of criteria, X_{ij} = The performance value of alternative i against criterion j and X_{0j} = The optimum value of criterion j

b. Normalization of Decision Making Matrix (DDM) for all criteria

$$X=\begin{bmatrix} X_{01} & \cdots & X_{0j} & \ldots & X_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{i1} & \ldots & X_{ij} & \ldots & X_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{n1} & \ldots & X_{mj} & \ldots & X_{mn} \end{bmatrix} \; i = 0,m; \quad j = 1,n \quad (6)$$

If the proposed criteria have a maximum value then the normality is

$$X_{ij} = \frac{Xij}{\sum_{i=0}^{m} Xij} \quad (7)$$

If the proposed criteria have a minimum value, then the normalization process has 2 stages, namely:

$$Xij = \frac{1}{X^*} \; ; \quad Xij = \frac{Xij}{\sum_{i=0}^{m} Xij} \quad (8)$$

c. Determine the weight of the matrix that has been normalized in stage b.

$$\sum_{j=1}^{n} wj = s1 \quad (9)$$

$$X=\begin{bmatrix} X_{01} & \cdots & X_{0j} & \ldots & X_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{i1} & \ldots & X_{ij} & \ldots & X_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{n1} & \ldots & X_{mj} & \ldots & X_{mn} \end{bmatrix} \; i = 0,m; \quad j = 1,n \quad (10)$$

d. Determine the value of the optimum function

$$S_{i=} \sum_{j=1}^{n} Xij; \qquad i = \quad 0, m, \quad (11)$$

e. Determine the ranking level

$$K_i = \frac{S_i}{S_0}; \quad i = \quad 0, m, \quad (12)$$

3. RESULTS AND DISCUSSION

3.1 Problem Analysis

In the problem analysis, it explains how the author's process of collecting the necessary data up to the research design stage. The data collection method is carried out by means of direct interviews to the research location. The researcher tried to find parts of the Wildlife Park that have the data needed for the research. General data about the Wildlife Park

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such as history, logo, meaning of the logo and organizational structure were obtained by the author through direct interviews with the general section of the Wildlife Park. While the data for the completion process such as the criteria for accepting animal nurses and procedures for accepting animal nurses were obtained by the author through direct interviews with the Head of the Wildlife Park Administration Affairs. After collecting the data needed for the research, the next stage is the author conducting a literature study stage to support the design of the system to be created. The author takes reference sources from books, e-books, and journals to be used as references for designing the system to be created. The alternatives used in this research process use 15 alternative data.

Table 1. Alternative Data

Alternative	Criteria				
	Education	Certificate	Age	Work Experience	Interview
A1	Associate's Degree	Have	20 Years	6 Years	78
A2	Associate's Degree	Have	21 Years	1,5 Years	65
A3	Senior Highschool	Have	22 Years	2 Years	60
A4	Associate's Degree	Have	20 Years	3 Years	78
A5	Associate's Degree	Have	26 Years	4 Years	65
A6	Senior Highschool	Dont have	21 Years	1,5 Years	70
A7	Vocational High School	Have	23 Years	3 Years	70
A8	Associate's Degree	Have	24 Years	4,5 Years	60
A9	Vocational High School	Have	27 Years	1 Years	78
A10	Associate's Degree	Have	21 Years	2 Years	75
A11	Senior Highschool	Dont have	23 Years	2 Years	65
A12	Associate's Degree	Have	20 Years	3 Years	60
A13	Vocational High School	Dont have	29 Years	4 Years	60
A14	Associate's Degree	Have	30 Years	4 Years	80
A5	Senior Highschool	Have	28 Years	2 Years	75

In Table 1, it can be seen that there are alternatives used in the research process carried out, after knowing the alternative data, the criteria data is then known as follows:

Table 2. Criteria Data

Code	Criteria	Status
C1	Education (E)	Benefit
C2	Certificate (C)	Benefit
C3	Age (A)	Cost
C4	Work Experience (WE)	Benefit
C5	Interview (I)	Benefit

In Table 2 you can see the criteria data for the research. From the criteria that have been determined and the suitability rating of each alternative that exists in each criterion that has been determined to obtain variables from each criterion, it must be made in the form of a graph for greater clarity, which can be seen in Figure 2.

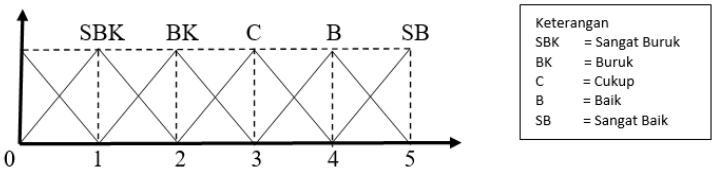

Figure 2. Fuzzy Weight Graph

From the Figure 2 above, it can be seen that fuzzy numbers can be converted into crisp numbers.

Table 3. Weight Values

Fuzzy Numbers	Value
Very Bad (SBK)	1
Bad (BK)	2
Enough (C)	3
Good (B)	4
Very Good (SB)	5

In Table 3 you can see the weight value for each criteria value entry. Alternative values are values that have been determined for each alternative that are previously displayed in the alternative value table for each criterion, the table display is as follows:

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Table 4. Matching Rating Value Data

Alternative	Criteria				
	E (B)	C (B)	A (C)	WE (B)	I (B)
A1	5	1	20	4	4
A2	5	1	21	2	4
A3	4	1	22	2	3
A4	5	1	20	2	4
A5	5	1	26	3	4
A6	4	0	21	2	4
A7	4	1	23	2	4
A8	5	1	24	3	3
A9	4	1	27	1	4
A10	5	1	21	2	4
A11	4	0	23	2	4
A12	5	1	20	2	3
A13	4	0	29	3	3
A14	5	1	30	3	4
A15	4	1	28	2	4
Max	5	1	20	4	4

In Table 4, we can see the suitability rating for each alternative value entry in the criteria. In the table, we can see that the number of alternatives is 15 and the criteria are 5.

3.2 Implementation of Entropy Method

The next process is to weight the criteria values using the Entropy Method. The Entropy weighting method is a decision-making method that provides a group of criteria and estimates the preference of a weight. Here are the steps of the entropy method:

a. Determination of initial matrix data

$$X_{ij} = \begin{bmatrix} 5 & 1 & 20 & 4 & 4 \\ 5 & 1 & 21 & 2 & 4 \\ 4 & 1 & 22 & 2 & 3 \\ 5 & 1 & 20 & 2 & 4 \\ 5 & 1 & 26 & 3 & 4 \\ 4 & 0 & 21 & 2 & 4 \\ 4 & 1 & 23 & 2 & 4 \\ 5 & 1 & 24 & 3 & 3 \\ 4 & 1 & 27 & 1 & 4 \\ 5 & 1 & 21 & 2 & 4 \\ 4 & 0 & 23 & 2 & 4 \\ 5 & 1 & 20 & 2 & 3 \\ 4 & 0 & 29 & 3 & 3 \\ 5 & 1 & 30 & 3 & 4 \\ 4 & 1 & 28 & 2 & 4 \end{bmatrix}$$

Where: C1, C2, C4 and C5 are Benefits; C3 is Cost

Max (X_{ij})= C1 = 4, C2 = 1, C4 = 4, C5 = 4

Min (X_{ij}) = C3 = 20

b. Normalization of the decision matrix (K_{ij})

Matrix normalization is obtained if the benefit criterion is the matrix value divided by the maximum value and if the cost criterion is then the minimum criterion value is divided by the matrix value.

C1 = Education (E)

$K_{11} = \frac{5}{5} = 1$ $K_{61} = \frac{4}{5} = 0{,}8$ $K_{111} = \frac{4}{5} = 0{,}8$

$K_{21} = \frac{5}{5} = 1$ $K_{71} = \frac{4}{5} = 0{,}8$ $K_{121} = \frac{5}{5} = 1$

$K_{31} = \frac{4}{5} = 0{,}8$ $K_{81} = \frac{5}{5} = 1$ $K_{131} = \frac{4}{5} = 0{,}8$

$K_{41} = \frac{5}{5} = 1$ $K_{91} = \frac{4}{5} = 0{,}8$ $K_{141} = \frac{5}{5} = 1$

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$K_{51} = \frac{5}{5} = 1$ $K_{101} = \frac{5}{5} = 1$ $K_{151} = \frac{4}{5} = 0{,}8$

By using the process that has been carried out for the First Criteria (C1), the same process stages are also carried out for criteria C2 to C5.

c. Menentukan nilai matriks a_{ij}

C1 = Education (E)

$a_{11} = \frac{1}{13{,}6} = 0{,}074$ $a_{61} = \frac{0{,}8}{13{,}6} = 0{,}059$ $a_{111} = \frac{0{,}8}{13{,}6} = 0{,}059$

$a_{21} = \frac{1}{13{,}6} = 0{,}074$ $a_{71} = \frac{0{,}8}{13{,}6} = 0{,}059$ $a_{121} = \frac{1}{13{,}6} = 0{,}074$

$a_{31} = \frac{0{,}8}{13{,}6} = 0{,}059$ $a_{81} = \frac{1}{13{,}6} = 0{,}074$ $a_{131} = \frac{0{,}8}{13{,}6} = 0{,}059$

$a_{41} = \frac{1}{13{,}6} = 0{,}074$ $a_{91} = \frac{0{,}8}{13{,}6} = 0{,}059$ $a_{141} = \frac{1}{13{,}6} = 0{,}074$

$a_{51} = \frac{1}{13{,}6} = 0{,}074$ $a_{101} = \frac{1}{13{,}6} = 0{,}074$ $a_{151} = \frac{0{,}8}{13{,}6} = 0{,}059$

By using the process that has been carried out for the First Criteria (C1), the same process stages are also carried out for criteria C2 to C5.

d. Calculation of entropy values for each criterion (E_j)

C1 = Education (E)

$a_{11} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$ $a_{61} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$ $a_{111} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$

$a_{21} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$ $a_{71} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$ $a_{121} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$

$a_{31} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$ $a_{81} = [0{,}074(\ln 0{,}074)] = -0{,}192$ $a_{131} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$

$a_{41} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$ $a_{91} = [0{,}059\ (\ln 0{,}059)] = -0{,}167$ $a_{141} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$

$a_{51} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$ $a_{101} = [0{,}074\ (\ln 0{,}074)] = -0{,}192$ $a_{151} = [0{,}059(\ln 0{,}059)] = -0{,}167$

$\sum_{i=1}^{m}[a_{ij}\ \ln(a_{ij})] = -2{,}701$

$E_1 = \frac{-1}{\ln(15)}\ -2{,}701$

$= \frac{-1}{2{,}708}\ -2{,}701$

$E_1 = 0{,}998$

By using the process that has been carried out for the First Criteria (C1), the same process stages are also carried out for criteria C2 to C5.

e. Calculation of dispersion for each criterion D_j

$D_1 = 1 - 0{,}998 = 0{,}002$

$D_2 = 1 - 0{,}918 = 0{,}082$

$D_3 = 1 - 0{,}996 = 0{,}004$

$D_4 = 1 - 0{,}984 = 0{,}016$

$D_5 = 1 - 0{,}997 = 0{,}003$

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$\sum D_j = 0{,}107$

f. Normalization of dispersion values W_j

$W_1 = \frac{0{,}002}{0{,}107} = 0{,}021$

$W_2 = \frac{0{,}082}{0{,}107} = 0{,}768$

$W_3 = \frac{0{,}004}{0{,}107} = 0{,}034$

$W_4 = \frac{0{,}016}{0{,}107} = 0{,}152$

$W_5 = \frac{0{,}003}{0{,}107} = 0{,}025$

Table 5. Criteria Weight Values (W_j)

No	Criteria Name	Weight Value (Wj)
1	Education (E)	0,021
2	Certificate (C)	0,768
3	Age (A)	0,034
4	Work Experience (WE)	0,152
5	Interview (I)	0,025
	SUM	1

After calculating the weight value, it can be seen in Table 5 for the weight value for each criterion, where the education criterion is the criterion with the highest weight and the interview process is the criterion with the lowest weight.

3.3 Implementation of ARAS Method

After getting the weight value for each criterion, the next step is to make a ranking for each alternative using the ARAS (Additive Ratio Assessment) method. The following are the steps for completing the ranking using the ARAS (Additive Ratio Assessment) method.

a. Determine the Decision Matrix

Table 6. Alternatives and Criteria

Alternative	Criteria				
	C1	C2	C3	C4	C5
X_0	4	1	30	1	4
X_1	5	1	20	4	4
X_2	5	1	21	2	4
X_3	4	1	22	2	3
X_4	5	1	20	2	4
X_5	5	1	26	3	4
X_6	4	0	21	2	4
X_7	4	1	23	2	4
X_8	5	1	24	3	3
X_{19}	4	1	27	1	4
X_{10}	5	1	21	2	4
X_{11}	4	0	23	2	4
X_{12}	5	1	20	2	3
X_{13}	4	0	29	3	3
X_{14}	5	1	30	3	4
X_{15}	4	1	28	2	4
Criteria Type	Max	Max	Min	Max	Max

In Table 6, we can see the suitability rating for each alternative value entry in the criteria. In the table, we can see that the number of alternatives is 15 and the criteria are 5.

b. Normalization of Decision Making Matrix (DDM) for all criteria

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$$X_{ij} = \begin{bmatrix} 5 & 1 & 20 & 4 & 4 \\ 5 & 1 & 21 & 2 & 4 \\ 4 & 1 & 22 & 2 & 3 \\ 5 & 1 & 20 & 2 & 4 \\ 5 & 1 & 26 & 3 & 4 \\ 4 & 0 & 21 & 2 & 4 \\ 4 & 1 & 23 & 2 & 4 \\ 5 & 1 & 24 & 3 & 3 \\ 4 & 1 & 27 & 1 & 4 \\ 5 & 1 & 21 & 2 & 4 \\ 4 & 0 & 23 & 2 & 4 \\ 5 & 1 & 20 & 2 & 3 \\ 4 & 0 & 29 & 3 & 3 \\ 5 & 1 & 30 & 3 & 4 \\ 4 & 1 & 28 & 2 & 4 \end{bmatrix}$$

The matrix above is added down to get the result [72, 13, 385, 36, 60]

C1 : Education (E)

$R_{01} = \frac{4}{72} = 0{,}056$ $R_{141} = \frac{5}{72} = 0{,}069$ $R_{81} = \frac{5}{72} = 0{,}069$ $R_{121} = \frac{5}{72} = 0{,}069$

$R_{11} = \frac{5}{72} = 0{,}069$ $R_{51} = \frac{5}{72} = 0{,}069$ $R_{91} = \frac{4}{72} = 0{,}056$ $R_{131} = \frac{4}{72} = 0{,}056$

$R_{21} = \frac{5}{72} = 0{,}069$ $R_{61} = \frac{4}{72} = 0{,}056$ $R_{101} = \frac{5}{72} = 0{,}069$ $R_{141} = \frac{5}{72} = 0{,}069$

$R_{31} = \frac{4}{72} = 0{,}056$ $R_{71} = \frac{4}{72} = 0{,}056$ $R_{111} = \frac{4}{72} = 0{,}056$ $R_{151} = \frac{4}{72} = 0{,}056$

By using the process that has been done in the First Criteria (C1), the same process stages are also carried out for criteria C2 to C5. So that the normalization matrix results are obtained as follows:

$$X^* = \begin{bmatrix} 0{,}056 & 0{,}077 & 0{,}049 & 0{,}028 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}074 & 0{,}111 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}070 & 0{,}056 & 0{,}067 \\ 0{,}056 & 0{,}077 & 0{,}067 & 0{,}056 & 0{,}05 \\ 0{,}069 & 0{,}077 & 0{,}074 & 0{,}056 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}057 & 0{,}083 & 0{,}067 \\ 0{,}056 & 0 & 0{,}070 & 0{,}056 & 0{,}067 \\ 0{,}056 & 0{,}077 & 0{,}064 & 0{,}056 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}061 & 0{,}083 & 0{,}05 \\ 0{,}056 & 0{,}077 & 0{,}055 & 0{,}028 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}070 & 0{,}056 & 0{,}067 \\ 0{,}056 & 0 & 0{,}064 & 0{,}056 & 0{,}067 \\ 0{,}069 & 0{,}077 & 0{,}074 & 0.056 & 0{,}05 \\ 0{,}056 & 0 & 0{,}051 & 0{,}083 & 0{,}05 \\ 0{,}169 & 0{,}077 & 0{,}049 & 0{,}083 & 0{,}067 \\ 0{,}056 & 0{,}077 & 0{,}053 & 0{,}056 & 0{,}067 \end{bmatrix}$$

c. Determine the weight of the matrix that has been normalized in step 2.

$D_{01} = X_{01} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{11} = X_{11} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{21} = X_{21} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{31} = X_{31} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{41} = X_{41} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{51} = X_{51} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{61} = X_{61} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{71} = X_{71} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{81} = X_{81} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

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$D_{91} = X_{91} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{101} = X_{101} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{111} = X_{111} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{121} = X_{121} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{131} = X_{131} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

$D_{141} = X_{141} * W_1 = 0{,}069 * 0{,}021 = 0{,}0014$

$D_{151} = X_{151} * W_1 = 0{,}056 * 0{,}021 = 0{,}0011$

By using the process that has been done in the First Criteria (C1), the same process stages are also carried out for criteria C2 to C5. So that the following matrix results are obtained:

$$D = \begin{bmatrix} 0{,}0011 & 0{,}059 & 0{,}0017 & 0{,}004 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0025 & 0{,}017 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0024 & 0{,}008 & 0{,}0017 \\ 0{,}0011 & 0{,}059 & 0{,}0023 & 0{,}008 & 0{,}0013 \\ 0{,}0014 & 0{,}059 & 0{,}0025 & 0{,}008 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0019 & 0{,}013 & 0{,}0017 \\ 0{,}0011 & 0 & 0{,}0024 & 0{,}085 & 0{,}0017 \\ 0{,}0011 & 0{,}059 & 0{,}0022 & 0{,}085 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0021 & 0{,}013 & 0{,}0013 \\ 0{,}0011 & 0{,}059 & 0{,}0018 & 0{,}004 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0024 & 0{,}085 & 0{,}0017 \\ 0{,}0011 & 0 & 0{,}0022 & 0{,}085 & 0{,}0017 \\ 0{,}0014 & 0{,}059 & 0{,}0025 & 0{,}085 & 0{,}0013 \\ 0{,}0011 & 0 & 0{,}0017 & 0{,}013 & 0{,}0013 \\ 0{,}0014 & 0{,}059 & 0{,}0017 & 0{,}013 & 0{,}0017 \\ 0{,}0011 & 0{,}059 & 0{,}0018 & 0{,}085 & 0{,}0017 \end{bmatrix}$$

d. Determine the value of the optimum function, by adding up the criteria values for each alternative from the results of multiplying the matrix by the weights from the previous step.

$S_0 = 0{,}0011 + 0{,}059 + 0{,}0017 + 0{,}004 + 0{,}0017 = 0{,}0677$

$S_1 = 0{,}0014 + 0{,}059 + 0.0025 + 0{,}017 + 0.0017 = 0{,}0816$

$S_2 = 0{,}0014 + 0{,}059 + 0.0024 + 0{,}0085 + 0.0017 = 0{,}0730$

$S_3 = 0{,}0011 + 0{,}059 + 0.0023 + 0{,}0085 + 0.0013 = 0{,}0722$

$S_4 = 0{,}0014 + 0{,}059 + 0.0025 + 0{,}0085 + 0.0017 = 0{,}0731$

$S_5 = 0{,}0014 + 0{,}059 + 0.0019 + 0{,}013 + 0.0017 = 0{,}0767$

$S_6 = 0{,}0011 + 0 + 0.0024 + 0{,}0085 + 0.0017 = 0{,}0136$

$S_7 = 0{,}0011 + 0{,}059 + 0.0022 + 0{,}0085 + 0.0017 = 0{,}0725$

$S_8 = 0{,}0014 + 0{,}059 + 0.0021 + 0{,}013 + 0.0013 = 0{,}0765$

$S_9 = 0{,}0011 + 0{,}059 + 0.0018 + 0{,}004 + 0.0017 = 0{,}0679$

$S_{10} = 0{,}0014 + 0{,}059 + 0.0024 + 0{,}0085 + 0.0017 = 0{,}0730$

$S_{11} = 0{,}0011 + 0 + 0.0022 + 0{,}0085 + 0.0017 = 0{,}0134$

$S_{12} = 0{,}0014 + 0{,}059 + 0.0025 + 0{,}0085 + 0.0013 = 0{,}0727$

$S_{13} = 0{,}0011 + 0 + 0.0017 + 0{,}013 + 0.0013 = 0{,}0168$

$S_{14} = 0{,}0014 + 0{,}059 + 0.0017 + 0{,}013 + 0.0017 = 0{,}0765$

$S_{15} = 0{,}0011 + 0{,}059 + 0.0018 + 0{,}0085 + 0.0017 = 0{,}0721$

e. Determine the highest ranking level of each alternative, by dividing the alternative value against alternative 0.

$K_0 = \frac{0{,}0677}{1} = 0{,}0677$ $K_4 = \frac{0{,}0731}{1} = 0{,}0731$ $K_8 = \frac{0{,}0765}{1} = 0{,}0765$ $K_{12} = \frac{0{,}0727}{1} = 0{,}0727$

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$K_1 = \frac{0,0816}{1} = 0,0816$ $K_5 = \frac{0,0767}{1} = 0,0767$ $K_9 = \frac{0,0679}{1} = 0,0679$ $K_{13} = \frac{0,0168}{1} = 0,0168$

$K_2 = \frac{0,0730}{1} = 0,0730$ $K_6 = \frac{0,0136}{1} = 0,0136$ $K_{10} = \frac{0,0730}{1} = 0,0730$ $K_{14} = \frac{0,0765}{1} = 0,0765$

$K_3 = \frac{0,0722}{1} = 0,0722$ $K_7 = \frac{0,0725}{1} = 0,0725$ $K_{11} = \frac{0,0134}{1} = 0,0134$ $K_{15} = \frac{0,0721}{1} = 0,0721$

From the calculations above, we can obtain the results of the ranking table for each alternative, as follows:

Table 7. Value of each alternative

Alternative	C1	C2	C3	C4	C5	S	K
A0	0,0011	0,059	0,0017	0,004	0,0017	0,0677	0,0677
A1	0,0014	0,059	0,0025	0,017	0,0017	0,0816	0,0816
A2	0,0014	0,059	0,0024	0,0085	0,0017	0,0730	0,0730
A3	0,0011	0,059	0,0023	0,0085	0,0013	0,0722	0,0722
A4	0,0014	0,059	0,0025	0,0085	0,0017	0,0731	0,0731
A5	0,0014	0,059	0,0019	0,013	0,0017	0,0767	0,0767
A6	0,0011	0	0,0024	0,0085	0,0017	0,0136	0,0136
A7	0,0011	0,059	0,0022	0,0085	0,0017	0,0725	0,0725
A8	0,0014	0,059	0,0021	0,013	0,0013	0,0765	0,0765
A9	0,0011	0,059	0,0018	0,004	0,0017	0,0679	0,0679
A10	0,0014	0,059	0,0024	0,0085	0,0017	0,0730	0,0730
A11	0,0011	0	0,0022	0,0085	0,0017	0,0134	0,0134
A12	0,0014	0,059	0,0025	0,0085	0,0013	0,0727	0,0727
A13	0,0011	0	0,0017	0,013	0,0013	0,0168	0,0168
A14	0,0014	0,059	0,0017	0,013	0,0017	0,0765	0,0765
A15	0,0011	0,059	0,0018	0,085	0,0017	0,0721	0,0721

In Table 7 above you can see the results. So, from the results of the calculation of the ranking level of each alternative, where the value of each alternative is divided by A0, it produces a Utility value which will be used as the ranking level to receive the best animal nurse with the highest results.

Table 8. Ranking

No	Alternative Name	Final Score	Information
1	A1	0,0816	1
2	A5	0,07679	2
3	A14	0,07654	3
4	A8	0,07653	4
5	A4	0,07314	5
6	A10	0,07302	6
7	A2	0,07302	7
8	A12	0,07272	8
9	A7	0,07252	9
10	A3	0,0722	10
11	A15	0,07214	11
12	A9	0,06797	12
13	A13	0,01684	13
14	A6	0,01369	14
15	A11	0,01348	15

So from the data in Table 8. above, the candidate for animal nurse who was accepted as an animal nurse at the Wildlife Park was A1 with a value of 0.0816.

4. CONCLUSION

Based on the research that has been done previously, several conclusions were obtained: The decision-making process in accepting animal nurses uses the required files and the assessment is carried out according to the criteria determined by the Wildlife Park. Using the Entropy and ARAS (Additive Ratio Assessment) methods is considered to be able to solve problems in accepting animal nurses. In the application of the Entropy Method, a weighting of the criteria values is produced where the criteria with the highest to lowest values are Certificates, Work Experience, Age, Interviews and Education with the highest value being 0.768 and the lowest being 0.021. Then the process of applying the

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selection of animal nurses using the ARAS method showed that alternative A1 was selected as the animal nurse with the value obtained being 0.0816.

REFERENCES

[1] V. M. M. Siregar, K. Sinaga, E. Sirait, A. Manalu, and A. T. Purba, "Sistem Pendukung Keputusan Pemilihan Tenaga Pendidik Terbaik Menggunakan Metode Complex Proportional Assessment," *J. TEKINKOM*, vol. 7, no. 1, pp. 310–317, 2024, doi: 10.37600/tekinkom.v7i1.1258.

[2] P. Citra and M. N. D. Satria, "Penerapan Metode Rank Order Centroid dan SMART Dalam Sistem Pendukung Keputusan Pemilihan Waitress Terbaik," *Chain J. Comput. Technol. Comput. Eng. Informatics*, vol. 2, no. 2, pp. 77–87, 2024, [Online]. Available: https://ejournal.techcart-press.com/index.php/chain/article/view/116%0Ahttps://ejournal.techcart-press.com/index.php/chain/article/download/116/110

[3] H. Bambang, I. W. Sriyasa, and P. Citra, "Kombinasi Metode SWARA dan SMART Dalam Sistem Pendukung Keputusan Pemilihan Guru Berprestasi," *J. Artif. Intell. Technol. Inf.*, vol. 2, no. 1, pp. 38–50, 2024.

[4] T. Ardiansah, "Sistem Pendukung Keputusan Menggunakan Metode WASPAS dalam Pemilihan Calon Ketua Komite Sekolah," *J. Data Sci. Inf. Syst.*, vol. 2, no. 1, pp. 50–58, 2024, [Online]. Available: https://doi.org/10.58602/dimis.v2i2.118

[5] Y. Rahmanto, "Sistem Pendukung Keputusan Pemilihan Pelanggan Terbaik Menggunakan Metode SD-MOORA," *J. Artif. Intell. Technol. Inf.*, vol. 2, no. 3, pp. 163–172, 2024.

[6] M. S. Lengkong, N. Dengen, and F. Agus, "Sistem Pendukung Keputusan Pemilihan Objek Wisata Kabupaten Berau Menggunakan Metode Additive Ration Assessment (ARAS)," *IKRAITH-INFORMATIKA*, vol. 9, no. 1, pp. 114–122, 2025.

[7] D. S. Jati, B. Bangun, and V. Sihombing, "Sistem pendukung keputusan pemilihan team leader program kewirausahaan mahasiswa dengan metode aras," *J. TEKINKOM*, vol. 7, no. 2, pp. 647–655, 2024, doi: 10.37600/tekinkom.v7i2.1544.

[8] L. Siregar, I. Faisal, and Khairunnisa, "Sistem Pendukung Keputusan Menentukan Bakal Calon Anggota Dewan Menggunakan Kombinasi Metode Entropy Dan Saw," *COMPTECH J. Ilmu Komput. Dan Teknol.*, vol. 1, no. 1, pp. 104–112, 2024.

[9] A. D. Wahyudi, S. Sumanto, S. Setiawansyah, and A. Yudhistira, "Sistem Pendukung Keputusan Rekomendasi Hotel Bintang Tiga Menggunakan Kombinasi Entropy dan Combine Compromise Solution," *Bull. Artif. Intell.*, vol. 3, no. 1, pp. 16–25, 2024, doi: 10.62866/buai.v3i1.142.

[10] P. Citra, H. B. Santoso, and I. W. Sriyasa, "Sistem Pendukung Keputusan Pemilihan E-Commerce Menggunakan Pembobotan Entropy dan COPRAS (JAVA)," *J. Ilm. Inform. Dan Ilmu Komput.*, vol. 3, no. 1, pp. 36–45, 2024.

[11] N. D. Puspa, M. Mesran, and A. F. Siregar, "Penerapan Metode Maut Dengan Pembobotan Entropy Dalam Sistem Pendukung Keputusan Penilaian Kinerja Guru Honor," *J. Inf. Syst. Res.*, vol. 5, no. 1, pp. 24–33, 2023, doi: 10.47065/josh.v5i1.4030.

[12] A. Ahyuna, B. Rahman, F. Nugroho, I. W. S. Nirawana, and A. Karim, "Analisa Penerapan Metode MABAC dengan Pembobotan Entropy dalam Penilaian Kinerja Dosen di Era Society 5.0," *Build. Informatics, Technol. Sci.*, vol. 5, no. 1, 2023, doi: 10.47065/bits.v5i1.3511.

[13] A. Surahman, "Penilaian Kinerja Karyawan Menggunakan Kombinasi Metode Multi-Objective Optimization by Ratio Analysis (MOORA) dan Pembobotan Entropy," *Chain J. Comput. Technol. Comput. Eng. Informatics*, vol. 2, no. 1, 2024.

[14] D. Puspa Wahyuni, N. Hanni Pradipa, M. Alfariqo, E. Septaulina Situmorang, and Afrisawati, "Pemilihan Cushion Terbaik untuk Wanita dengan Metode ARAS," *J. Inform. dan Teknol. Inf.*, vol. 3, no. 1, pp. 275–282, 2024, doi: 10.56854/jt.v3i1.343.

[15] M. H. Al Rasyid, M. Arsyad, F. Halawa, and Sutarman, "Analisis Perbandingan Metode Additive Ratio Assesment (ARAS) dan Weight Aggregated Sum Product Assesment (WASPAS) Dalam Pembiayaan Penelitian Mandiri Dosen," *J. SAINTIKOM (Jurnal Sains Manaj. Inform. dan Komputer)*, vol. 23, no. 1, pp. 260–272, 2024, [Online]. Available: https://ojs.trigunadharma.ac.id/index.php/jis/index

[16] A. K. Sembiring, Ishak, and Z. Panjaitan, "Implementasi Metode ARAS Dalam Menentukan Tingkat Kepuasan Masyarakat Terhadap Pelayanan Desa," *J. Sist. Inf. TGD*, vol. 3, no. 2, pp. 274–282, 2024.

[17] H. K. Ginting, F. Rizky, and M. Syaifuddin, "Sistem Pendukung Keputusan Untuk Menentukan Ikan Cupang Dengan Nilai Jual Tinggi Menggunakan Metode Aras (Additive Ratio Assessment)," *J. Sist. Inf. TGD*, vol. 3, no. 1, pp. 1–11, 2024.

[18] Y. I. Pradana, M. Yetri, and A. Calam, "Penerapan Metode Additive Ratio Assessment (ARAS) Dalam Pendukung Keputusan Recruitment Kepala Toko," *J. Sist. Inf. TGD*, vol. 3, no. 4, pp. 1–5, 2024.

[19] M. Tonggiroh, S. Nurhayati, Yakub, and Jusmawati, "Sistem Pendukung Keputusan Pemilihan Wireless Router Menggunakan Pendekatan Rank Reciprocal dan ARAS," *J. Fasilkom*, vol. 14, no. 1, pp. 206–215, 2024, doi: 10.37859/jf.v14i1.6838.

[20] M. Baihaqi and H. Rosyid, "Sistem Penilaian Kinerja Guru Dengan Metode Addittive Ratio Assessment (ARAS) : Studi Kasus MI Darul Ulum Benem," *J. Nas. Komputasi dan Teknol. Inf.*, vol. 7, no. 1, pp. 46–62, 2024.

[21] R. B. Ginting, D. Y. B. Ginting, and D. P. Utomo, "Sistem Pendukung Keputusan Pemilihan Karyawan Terbaik Menggunakan Metode WASPAS," *Bull. Inf. Technol.*, vol. 5, no. 2, pp. 2091–2096, 2024, doi: 10.36040/jati.v8i2.9359.

[22] S. Nastiti, K. Sussolaikah, I. Saputra, and D. P. Utomo, "Penerapan Multi Objective Optimization on the Basis of Ratio Analysis (MOORA) dalam Penentuan Bantuan Siswa Miskin (BSM) pada SMK," *J. Decis. Support Syst. Res.*, vol. 2, no. 1, pp. 11–19, 2024.

[23] D. P. Utomo, "Penerapan Sistem Pendukung Keputusan Pada Pengambilan Keputusan Penilaian Kinerja Karyawan dengan Menerapkan Metode MOOSRA," *J. Comput. Syst. Informatics*, vol. 5, no. 2, 2024.

[24] S. Setiawansyah, "Penerapan Metode Entropy dan Grey Relational Analysis dalam Evaluasi Kinerja Karyawan," *J. Data Sci. Inf. Syst.*, vol. 2, no. 1, pp. 29–39, 2024, [Online]. Available: https://ejournal.techcart-press.com/index.php/dimis/article/view/100%0Ahttps://ejournal.techcart-press.com/index.php/dimis/article/download/100/95

[25] D. Handoko, "Kombinasi Metode Pembobotan Entropy dan Grey Relational Analysis dalam Pemilihan Pelanggan Terbaik," *J. Ilm. Inform. DAN ILMU Komput.*, vol. 3, no. 2, pp. 70–79, 2024.

[26] Andi Ernawati, "Penerapan Algoritma Entropy dan Aras Menentukan Desa Terbaik Di Pemerintah Kabupaten Labuhanbatu," *Kaji. Ilm. Inform. dan Komput.*, vol. 3, no. 1, pp. 41–51, 2022.

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Volume 7, No 1, June 2025 Page: 487−499
ISSN 2684-8910 (media cetak)
ISSN 2685-3310 (media online)
DOI 10.47065/bits.v7i1.7048

[27] N. Rizqullah, M. G. Resmi, and I. Kaniawulan, "Penentuan Daerah Berpotensi Kekurangan Distribusi Air Bersih Menggunakan Metode Additive Ratio Assessment (Aras) (Studi Kasus : Pdam Purwakarta)," *JATI (Jurnal Mhs. Tek. Inform.*, vol. 8, no. 5, pp. 9833–9841, 2024.

[28] D. Guswandia, M. Hafizhb, S. Wahyunic, and T. Novita, "Implementasi Metode ARAS dalam Penentuan Kelayakan Pemberian Kredit Pemilikan Rumah (KPR)," *J. Teknol. Dan Sist. Inf. Bisnis*, vol. 7, no. 1, pp. 226–232, 2025.

[29] H. Sugara, E. P. Parapat, E. D. Siringo-ringo, M. Yunus, M. A. Hanafiah, and Y. D. Lestari, "Sistem Pendukung Keputusan Pemilihan Calon PustakawanMenggunakan Metode Aras," *J. TEKINKOM*, vol. 7, pp. 292–299, 2024, doi: 10.37600/tekinkom.v7i1.1055.