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ADDITIVE RATIO ASSESSMENT ALGORITHM ON DECISION SUPPORT SYSTEM FOR SELECTING THE BEST SMA AND SMK

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Abstract—*Determination of the best SMA and SMK through the Education Office Technical Implementation Unit (UPTD) of Pinggir Subdistrict, Bengkalis Regency, needs to be done to provide information to parents, especially students who want to continue their schooling to SMA and SMK level in order to know the ranking of destination schools and be able to make choices. The assessment is still done manually and has not used the right ranking method to determine the best school at the SMA and SMK level, especially in Pinggir District, Bengkalis Regency so that the assessment system is still not on target so that there is difficulty in the process of selecting the best SMA and SMK in the Pinggir Education UPTD. Bengkalis Regency to be right on target. The purpose of this study is to provide convenience in the process of selecting the best SMA and SMK with a decision support system using 7 criteria, namely school facilities, accreditation status, graduates, student achievement, location, human resources and extracurricular activities. The method used in this research is to use the Additive Ratio Assessment (ARAS). There are 8 schools that serve as alternative data, namely SMAN 1, SMAN 2, SMAN 3, SMAN 4, SMAN 5, SMAN 6, SMKN 1 and SMKN 2. The results obtained are that there are 4 recommended schools, namely SMKN 1 = 0.122477, SMKN 2 = 0.121488, SMAN 5 = 0.116763, SMAN 6 = 0.112653 and SMAN 1 = 0.108850. So that the results of this research can help in determining the best school.*

Keywords: *decision support system, senior high school, additive ratio assessment, uptd.*

Abstrak—Penentuan SMA dan SMK terbaik melalui Unit Pelaksana Teknis Dinas (UPTD) Pendidikan Kecamatan Pinggir Kabupaten Bengkalis perlu dilakukan untuk memberikan informasi kepada orang tua terutama siswa/i yang ingin melanjutkan sekolah ke tingkat SMA dan SMK agar mengetahui rangking sekolah tujuan dan bisa menentukan pilihan. Penilaian yang dilakukan masih secara manual dan belum menggunakan metode perangkingan yang tepat untuk menentukan sekolah terbaik pada tingkat SMA dan SMK khususnya di Kecamatan Pinggir Kabupaten Bengkalis sehingga sistem penilaian masih belum tepat sasaran sehingga terjadi kesulitan dalam proses pemilihan SMA dan SMK terbaik di UPTD Pendidikan Kecamatan Pinggir Kabupaten Bengkalis agar tepat sasaran. Tujuan dalam penelitian ini adalah memberikan kemudahan dalam proses pemilihan SMA dan SMK terbaik dengan sistem pendukung keputusan dengan menggunakan kriteria 7 kriteria yaitu Fasilitas Sekolah, Status Akreditasi, Lulusan, Prestasi Siswa, Lokasi, SDM dan Ekstrakurikuler. Metode yang dilakukan dalam penelitian ini adalah menggunakan Additive Ratio Assesment (ARAS). Terdapat 8 sekolah yang dijadikan sebagai data alternatif yaitu SMAN 1, SMAN 2, SMAN 3, SMAN 4, SMAN 5, SMAN 6, SMKN 1 dan SMKN 2. Hasil penelitian yang diperoleh adalah Terdapat 5 sekolah yang direkomendasikan yaitu SMKN 1 = 0,122477, SMKN 2 = 0,121488, SMAN 5 = 0,116763, SMAN 6 = 0,112653 dan SMAN 1 = 0,108850. Sehingga dengan hasil penelitian ini bisa membantu dalam penentuan sekolah terbaik.

Kata Kunci: sistem pendukung keputusan, sekolah, ARAS, UPTD.

INTRODUCTION

National Education based on the 1945 Constitution article 31 paragraph (1) states that "Every citizen has the right to education". And Paragraph (3) emphasizes that "The government seeks and organizes a national education system that increases faith and piety as well as noble character in the context of educating the nation's life which is one of the goals of the State of Indonesia[1]. SMA (High School) is a level of education that aims to shape a student's personality and prepare themselves, students' thinking patterns for school to a higher level[2].

The selection of the best schools, especially for SMA and SMK levels, is something that is

expected by students who will continue to that level. In determining the choice of schools that are affordable from an economical point of view, the ability of students and students to be interested in learning according to their fields, time and locations that are easily accessible are not easy.[3]. A decision support system is a computer-based information system, to produce several alternative decisions to help deal with problems using data and models[4]. In previous studies, the implementation of ARAS on a decision support system for livable housing recipients aimed to apply ARAS in determining the eligibility decisions of prospective recipients of livable housing assistance from all existing criteria, so that it can be determined using a decision support system[5]. In a study entitled the best village assessment decision support system also uses ARAS[6].

ARAS is a multi-criteria decision-making method based on the concept of ranking using the utility degree, namely by comparing the overall index value of each alternative to the overall index value of the optimal alternative[7]. In a study entitled the best teacher assessment decision support system with ARAS, with the ARAS ranking method to get the best teacher assessment results to be more targeted because the assessment process uses criteria and weight calculations[8]. A decision support system using ARAS is also carried out to determine the best head of production, using ARAS[9]. A decision support system is also used to predict the portion of housing development funds[10].

A decision support system has also been carried out for assessing lecturer performance using ARAS so that decision makers will easily determine the order of lecturers based on the weight values obtained in the assessment process [11]. In previous studies, ARAS was also used for a decision support system for evaluating public competitions and village administrations[12]. The results of this decision are not absolute because the decision support system (DSS) is the provision of alternative decision solutions, while the absolute decision is still decided by the party making the decision[13]. ARAS is a method that has utility to the value of the function so that the results obtained areefficiency on a number of viable alternatives [14]. ARAS is also used as a ranking method because it has an optimization value[15]. Choosing the best school is the right choice for students who will continue to high school or vocational school, especially in the UPTD area of Pinggir District.

There needs to be a decision support system that can provide information in determining the preferred high school or vocational school in order to find out the ranking of the school. The purpose of this study is to create a decision support system for determining the best SMA and SMK using the ARAS algorithm so that the results obtained become a source of information that can assist in choosing the best SMA and SMK to be the school of choice.

MATERIALS AND METHODS

The stages of research on the ARAS algorithm on a decision support system for determining the best SMA and SMK are as follows:

1. Identifying problems, namely problems found in making decisions for determining the best SMA and SMK in accordance with the literature and information obtained.
2. Analyzing the problem, namely the problem found in the object of research, then analysis is carried out.
3. Data collection, namely collecting the data needed in this study by means of observation, interviews and literature.
4. Determining the criteria, which is to be a reference in the calculation process using ARAS in determining a decision.
5. Data analysis, namely the data that has been obtained will be managed and from the data can also be given a weight for each criterion.
6. Implementation of ARAS in order to obtain the best results in determining a decision.
7. Alternative ranking, which is doing a ranking process to get the highest value from all alternative data.
8. System evaluation, which is conducting a system evaluation process with accuracy as a comparison between the actual data and the data calculated by the system using ARAS.
9. Conclusion, namely taking a conclusion on the data that has been analyzed and processed previously so that it becomes the result of this study.

The data used by the author in this study were sourced from UPTD Kec. Edge through direct observation. The data used as a reference for research is a list of names of high school and vocational high schools. There are 10 schools that will be implemented in ARAS for the calculation process to be carried out based on the criteria that have been set in determining the best school.

The data collection techniques used by the author are:

1. Observation, the author collects data from the object of research directly by making observations at the Air Jamban village office.
2. Literature study, namely the author approaches with references such as journals or books that are in accordance with the research topic.
3. Interview, where the author conducts discussions with related parties to be able to

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obtain information on what is needed for research material.

The following are the steps in the calculation using ARAS [16] :

1. Formation of Decision Making Matrix.

$$X=\begin{bmatrix} X_{01} & \cdots & X_{0j} & \cdots & X_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{i1} & \cdots & X_{ij} & \cdots & X_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{n1} & \cdots & X_{mj} & \cdots & X_{mn} \end{bmatrix}$$

$$i= j=\overline{0,m};\overline{1,n}; \quad \text{.....(1)}$$

where:
m = number of alternatives
n = number of criteria
Xij = performance value of alternative i against j
X0j = optimum value of criteria

2. Normalization of Decision Making Matrix for all criteria.

$$X=\begin{bmatrix} X_{01} & \cdots & X_{0j} & \cdots & X_{0n} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{i1} & \cdots & X_{ij} & \cdots & X_{in} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ X_{n1} & \cdots & X_{mj} & \cdots & X_{mn} \end{bmatrix}$$

$$i= j=\overline{o,m};\overline{1,n}; \quad \text{.....(2)}$$

If the proposed criteria is the maximum value then the normalization is

$$X_{ij} = \frac{X_{ij}}{\sum_{i=0}^{m}} X_{ij} \quad \text{.....(3)}$$

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

$$X_{ij} = \frac{1}{X*ij} \quad ; \quad X_{ij} = \frac{X_{ij}}{\sum_{i=0}^{m}} X_{ij} \quad \text{.....(4)}$$

3. Determine the matrix weights that have been normalized in step 2.

$$\sum_{j=1}^{n} W_j = 1 \quad \text{.....(5)}$$

4. Determine the optimum function value.

$$S_i = \sum_{j=1}^{n} X_{ij} \; ; \quad i = o,m \quad \text{.....(6)}$$

Si is the overall index value on the i-th alternative[17].

5. Determine the rating level.

$$K_i = \frac{S_i}{S_0} \; ; i = \overline{o,m} \quad \text{.....(7)}$$

RESULTS AND DISCUSSION

1. Alternative Data

In making a decision support system required data to be processed and referred to as alternative data (Ai) as shown in Table 1.

Table 1. List of School Names

No	School Name	Subdistrict
1	SMA Negeri 1	Pinggir
2	SMA Negeri 2	Pinggir
3	SMA Negeri 3	Pinggir
4	SMA Negeri 4	Pinggir
5	SMA Negeri 5	Pinggir
6	SMA Negeri 6	Pinggir
7	SMK Negeri 1	Pinggir
8	SMK Negeri 2	Pinggir

2. Determining Criteria and Weights

To determine the ranking of each alternative data, the process of assigning a weight value is carried out first. The determination of the importance weight of each criterion (Wj) can be seen in Table 2.

Table 2. Criteria and Weights

No	Criteria (Ci)	Information	Mark Weight (%)
1	C1	School facility	15
2	C2	Accreditation Status	20
3	C3	Graduate Quality	10
4	C4	Student achievement	10
5	C5	School Location	15
6	C6	HR Professional	15
7	C7	Extracurricular	15

In Table 2 it is explained that the criteria are given the initials (Ci) and a description of each criterion, then the weights and variables are given. The criteria for school facilities (C1) are as shown in Table 3.

Table 3. Criteria for School Facilities (C1)

Variable	Sub-Criteria	Weight Value
Complete Facilities	Very good	5
Complete Facilities	Well	4
Facilities Not Complete	Pretty good	3

In Table 3 there are variables for the criteria for School Facilities, namely complete and quite complete and incomplete. The highest weight value

is 5 with Very Good criteria and the lowest weight is 3 for Good Enough criteria.

Table 4. Criteria for Accreditation Status (C2)

Variable	Sub-Criteria	Weight Value
A Accreditation	Very good	5
B Accreditation	Well	4
C Accreditation	Pretty good	3

In Table 4 there are variables of Accreditation Status A, Accreditation B and Accreditation C.

Table 5. Graduate Quality Criteria (C3)

Variable	Sub-Criteria	Weight Value
1. Continuing Study at PTN/PTS	Very good	5
2. Work without Study	Well	4
3. Not working/studying	Not good	2

In Table 5 there are variables for the quality criteria of graduates, namely Continuing Study in PTN/PTS, Working without studying and Not working/college. The highest weight value is 5 with Very Good criteria and the lowest weight is 2 for Less Good criteria.

Table 6. Student Achievement Criteria (C4)

Variable	Sub-Criteria	Weight Value
International	Very good	5
National	Well	4
Region/Local	Pretty good	3
There is not any	Not good	2

In Table 6 there are variables for student achievement criteria, namely International, National, Regional/Local and None. The highest weight value is 5 with Very Good criteria and the lowest weight is 2 for Less Good criteria.

Table 7. Criteria for School Location (C5)

Variable	Sub-Criteria	Weight Value
Close	Very good	5
Far	Well	4

In Table 7 there are variables for school location criteria, namely Near and Far. The highest weight value is 5 with Very Good criteria and the lowest weight is 4 for Good criteria.

Table 8. Professional HR Criteria (C6)

Variable	Sub-Criteria	Weight Value
100% Linear	Very good	5
80% Linear	Well	4
50% Linear	Pretty good	3
20% Linear	Not good	2

In Table 8 there are variables for the HR Professional criteria, namely 100% linear, 80% linear, 50% linear and 20% linear. The highest weight value is 5 with Very Good criteria and the lowest weight is 2 for Less Good criteria.

Table 9. Extracurricular Criteria (C7)

Variable	Sub-Criteria	Weight Value
Complete	Very good	5
Quite complete	Well	4
Not complete	Pretty good	3

In Table 9 there are variables for extracurricular criteria, namely complete, quite complete and incomplete. The highest weight value is 5 with Very Good criteria and the lowest weight is 3 for Less Good criteria.

3. Determining Criteria and Weights

Step 1: Formation of decision matrix (Decision Matrix)

Table 10. Decision Matrix

(ai)	C1	C2	C3	C4	C5	C6	C7
A0	**5**	**5**	**5**	**4**	**5**	**5**	**5**
A1	3	4	4	3	4	4	5
A2	4	3	2	2	4	3	5
A3	4	4	4	4	4	3	3
A4	3	3	2	2	4	3	3
A5	3	5	5	3	5	4	4
A6	4	4	4	4	4	4	4
A7	4	5	4	3	5	5	4
A8	5	5	5	3	4	4	4

For all criteria worth *Max*

In Table 10 there are 7 criteria, namely C1-C7 and 8 Alternative Data, namely A1-A8. A0 is the initialization of additional alternatives as a place for the Max value criteria determined from the highest value of each criterion.

Step 2: Normalization of decision matrix for all criteria.

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$$X=\begin{bmatrix}5&5&5&4&5&5&5\\3&4&4&3&4&4&5\\4&3&2&2&4&3&5\\4&4&4&4&4&3&3\\3&3&2&2&4&3&3\\3&5&5&3&5&4&4\\4&4&4&4&4&4&4\\4&5&4&3&5&5&4\\5&5&5&3&4&4&4\end{bmatrix}$$

The above matrices are added down to get the results [35, 38, 35, 28, 39, 35, 37]. Then normalize the matrix for all criteria (Ci). Furthermore, the results of the calculation of the decision matrix from criteria C1 to C7, the normalized values are obtained as follows:

$$\begin{bmatrix}0{,}142857&0{,}131579&0{,}142857&0{,}142857&0{,}128205&0{,}142857&0{,}135135\\0{,}085714&0{,}105263&0{,}114286&0{,}107143&0{,}102564&0{,}114286&0{,}135135\\0{,}114286&0{,}078947&0{,}057143&0{,}071429&0{,}102564&0{,}085714&0{,}135135\\0{,}114286&0{,}105263&0{,}114286&0{,}142857&0{,}102564&0{,}085714&0{,}081081\\0{,}085714&0{,}078947&0{,}057143&0{,}071429&0{,}102564&0{,}085714&0{,}081081\\0{,}085714&0{,}131579&0{,}142857&0{,}107143&0{,}128205&0{,}114286&0{,}108108\\0{,}114286&0{,}105263&0{,}114286&0{,}142857&0{,}102564&0{,}114286&0{,}108108\\0{,}114286&0{,}131579&0{,}114286&0{,}107143&0{,}128205&0{,}142857&0{,}108108\\0{,}142857&0{,}131579&0{,}142857&0{,}107143&0{,}102564&0{,}114286&0{,}108108\end{bmatrix}$$

Step 3: Determine the normalized weight by multiplying the normalized matrix in step 2. The weights used for multiplication in step 3 are **0.15 , 0.2 , 0.1 , 0.1 , 0.15 , 0.15 , 0.15.**

This weight value is obtained from Table 2 which has been determined in the previous step. The results of all the criteria that can be obtained so as to form a matrix are as follows:

$$\begin{bmatrix}0{,}021429&0{,}026316&0{,}014286&0{,}014286&0{,}019231&0{,}021429&0{,}020270\\0{,}012857&0{,}021053&0{,}011429&0{,}010714&0{,}015385&0{,}017143&0{,}020270\\0{,}017143&0{,}015789&0{,}005714&0{,}007143&0{,}015385&0{,}012857&0{,}020270\\0{,}017143&0{,}021053&0{,}011429&0{,}014286&0{,}015385&0{,}012857&0{,}012162\\0{,}012857&0{,}015789&0{,}005714&0{,}007143&0{,}015385&0{,}012857&0{,}012162\\0{,}012857&0{,}026316&0{,}014286&0{,}010714&0{,}019231&0{,}017143&0{,}016216\\0{,}017143&0{,}021053&0{,}011429&0{,}014286&0{,}015385&0{,}017143&0{,}016216\\0{,}017143&0{,}026316&0{,}011429&0{,}010714&0{,}019231&0{,}021429&0{,}016216\\0{,}021429&0{,}026316&0{,}014286&0{,}010714&0{,}015385&0{,}017143&0{,}016216\end{bmatrix}$$

Step 4: Determine the value of the optimum function by adding up the value of the criteria for each alternative from the result of multiplying the matrix with the weights. The following is the result of the calculation for the optimum function value.

$$\begin{bmatrix}0{,}137245\\0{,}108850\\0{,}094302\\0{,}104314\\0{,}081908\\0{,}116763\\0{,}112653\\0{,}122477\\0{,}121488\end{bmatrix}$$

So that the results obtained at the optimum function value if added as a whole is 0.100000

Step 5: Determine the highest ranking level of each alternative by dividing the value of the alternative to alternative 0 (A0). The results are as follows:

0.137245. 0.108850. 0.094302. 0.104314. 0.081908. 0.116763. 0.112653. 0.122477. 0.121488.

From the results of these calculations, it can be obtained the results of the ranking levels of each alternative. The results of the calculation of the highest ranking level of all alternatives. The values for each are sorted from the highest value to the lowest value as shown in Table 11.

Table 11. Rankings

(Ai)	School Name	Value (Ki)	Rank
A0	-	**0,137245**	-
A1	**SMAN 1**	**0,108850**	**5**
A2	**SMAN 2**	**0,094302**	**7**
A3	**SMAN 3**	**0,104314**	**6**
A4	**SMAN 4**	**0,081908**	**8**
A5	**SMAN 5**	**0,116763**	**3**
A6	**SMAN 6**	**0,112653**	**4**
A7	**SMKN 1**	**0,122477**	**1**
A8	**SMKN 2**	**0,121488**	**2**

In Table 12, it is known that all alternative data that have been processed using the Additive Ratio Assessment (ARAS) method have different values (Ki). The results of determining the best SMA and SMK based on the highest score.

Table 12. Highest - Lowest Ranking Results

(Ai)	School Name	Value (Ki)	Rank	Results
-	-	-	-	
A7	**SMKN 1**	**0,122477**	**1**	Recommendation
A8	**SMKN 2**	**0,121488**	**2**	Recommendation
A5	**SMAN 5**	**0,116763**	**3**	Recommendation
A6	**SMAN 6**	**0,112653**	**4**	Recommendation
A1	**SMAN 1**	**0,108850**	**5**	Recommendation
A3	**SMAN 3**	**0,104314**	**6**	No
A2	**SMAN 2**	**0,094302**	**7**	No
A4	**SMAN 4**	**0,081908**	**8**	No

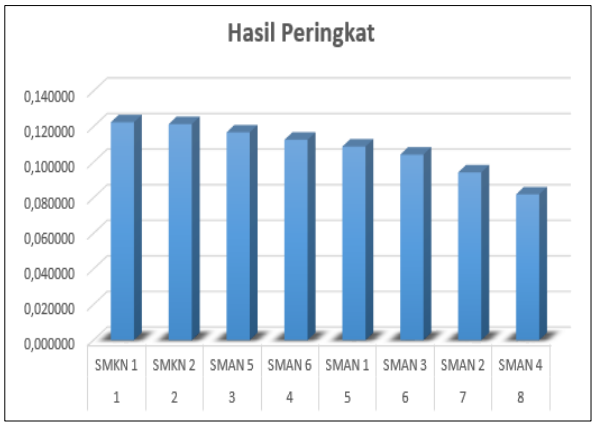

Figure 1. Graph of Ranking Results

Figure 1 shows the results of the best SMA and SMK assessments based on the highest-lowest scores. The value (Ki) that will be recommended is alternative data that gets the highest score, there are 5 schools, namely **SMKN 1, SMKN 2, SMAN 5, SMAN 6 and SMAN 1** as the best SMA and SMK in the UPTD Education Area, Pinggir District.

CONCLUSION

In this study the decision support system for determining the best SMA and SMK carried out data analysis and calculation process using ARAS. ARAS implementation is very helpful to assist in decision making. There are 8 alternative data consisting of several SMA and SMK, then there are 7 criteria used in this study. Based on calculations using the ARAS method, the decision for the 5 Best Schools became a recommendation because it had the highest score.

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REFERENCE

[1] S. Ipnuwati, D. Puspita, Mardianto, D. Kusmawati, and MA Badruzaman Al Khoir, "Decision Support Applications Using the Simple Additive Weighting Method to Determine the Best Vocational High School Rankings in Central Lampung Based on Websites," *Semin. Nas. Has. researcher. and Servant. 2019*, pp. 284–292, 2019.

[2] YA Saragih, JT Hardinata, and MR Lubis, "Decision Support System for Selection of the Best Private High School Using the PROMETHEE Method in Pematangsiantar City," *BRAHMANA J. Application of Artificial Intelligence*, vol. 1, no. 1, pp. 40–47, 2019.

[3] E. Astuti and NE Saragih, "The Best School Selection Decision Support System with the Moora Method," *J. Ilm. information.*, vol. 8, no. 2, pp. 136–140, 2020.

[4] I. Nur Okta and B. Satria, "Decision Support System in Determining Damaged Road Repair Using the Simple Additive Weighting (SAW) Method (Case Study: Kuantan Singingi Regency)," *Jar. Sis. inf. Robot.*, vol. 3, no. 1, pp. 194–202, 2019.

[5] B. Satria and L. Tambunan, "Decision Support System for Eligible Housing Assistance Recipients Using FMADM and SAW," *JOINTECS (Journal Inf. Technol. Comput. Sci.*, vol. 5, no. 3, pp. 167–176, 2020.

[6] Anas, "The Best Village Assessment Decision Support System Using Additive Ratio Assessment (ARAS)," J. Sist. inf. AND Tech. Computing., vol. 4, no. 1, pp. 32–39, 2019.

[7] M. Maumbu and Betrisandi, "Decision Support System for Selection of Empowerment Assistance Beneficiaries for Cattle Farmer Groups Using the Additive Ratio Assessment Method in Molosipat Village," vol. 5, no. 1, pp. 26–30, 2020.

[8] A. Apandi, "The Best Teacher Assessment Decision Support System Using the Additive

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P-ISSN: 2685-8223 | E-ISSN: 2527-4864
DOI: 10.33480/jitk.v7i1.2217

Ratio Assessment (Aras) Method," *Semin. Nas. Technol. computer. science*, pp. 476–483, 2020.

[9] F. Pohan and AB Ginting, "The Best Production Head Selection Decision Support System Using the Additive Ratio Assessment (ARAS) Method," *Semin. Nas. Technol. computer. science*, pp. 579–589, 2019.

[10] B. Satria, T. Radillah, L. Tambunan, and M. Iqbal, "Implementation of the Fuzzy Sugeno Method for Predicting the Determination of the Portion of Housing Development Funds," *JSAI (Journal Sci. Appl. Informatics)*, vol. 4, no. 1, pp. 75–84, 2021.

[11] A. Yunus Labolo, "Decision Support System for Lecturer Performance Assessment Using Additive Ratio Assessment Method," *J. Sis. inf. AND Tech. computer.*, vol. 5, no. 1, pp. 31–35, 2020.

[12] P. Tino and Anas, "Decision Support System for Assessment of Public Service and Village Administration Competition Using Additive Ratio Assessment (ARAS) Method," vol. 5, no. 1, pp. 21–25, 2020.

[13] A. Sari, NA Hasibuan, and I. Saputra, "Decision Support System for Choosing the Best Window Film Tinter Using the ARAS Method (Case Study: PT. Degree The Ambassador)," *KOMIK (Nas Conference. Technol. Inf. and Computers)*, vol. 3, no. 1, pp. 307–315, 2019.

[14] AA Suryani and D. Ernawati, "Selection of Partners for the Utilization of Jonjot Waste Using the ARAS (Additive Ratio) Method Assessment) at Perum XYZ," Juminten J. Manaj. eng. and Teknol., vol. 01, no. 04, pp. 37–48, 2020.

[15] H. Halimah, D. Kartini, F. Abadi, I. Budiman, and M. Muliadi, "Test the sensitivity of the Aras Method with the Sahnnon Entropy and Swara Criteria Weighting Method Approach in the Selection of Prospective Employees," *J. ELTIKOM*, vol. 4, no. 2, pp. 96–104, 2020.

[16] B. Satria, "Implementation Of Additive Ratio Assessment (ARAS) Method On Decision Support System For Recipient Of Inhabitable House," *JITK (Journal of Knowledge and Computer Technology)*, vol. 6, no. 1, pp. 121–128, 2020.

[17] E. Ndruru, "Utilization of Decision Support Systems in the Selection of the Best Pkw Using the Aras Method at Lpk2-Pascom Medan," *J. Inf. Logs.*, vol. I, no. 2, pp. 26–34, 2019.

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