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Decision Support System for Extreme Poverty BLT Recipients Combining the ROC and WASPAS Methods

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ABSTRACT

The Covid-19 pandemic has begun to be under control and the basis for the Village Fund BLT distribution has been adjusted. BLT Dana Desa aims to increase the income of extremely poor families in the village. In determining and determining prospective Beneficiary Families (KPM), each village will be guided by the data for the Acceleration of Extreme Poverty Elimination (PPKE) provided by the central government through the local government which will later be verified by the village government. Therefore, a Decision Support System is needed to find out who really deserves assistance, so that the allocation can be right on target according to predetermined criteria. In this study the results of this study show that the proposed model can be used well in conducting the selection process for laboratory assistant admissions. In this research, the use of ROC is able to provide appropriate criteria weights based on the level of importance of the criteria from the decision maker. Meanwhile, the use of the WASPAS method is able to produce decisions in the form of the best alternatives that can be used to help decision makers. From the calculation process that has been done, it can be concluded that Sunardi got the highest score, namely 0.7276 and Muksin got the lowest score, namely 0.5491. The existence of this system can make it easier for the government, especially villages, to identify beneficiaries and minimize errors in selecting beneficiaries.

Keywords: Decision Support System; Direct Cash Assistance; Extreme poverty; ROC Method; WASPAS Method.

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1. INTRODUCTION

The Covid-19 pandemic attracted world attention in early 2020. The Covid-19 pandemic has damaged socially and economically. To overcome this problem, the government allocates a village fund budget that is actually intended for village development into a social assistance fund known as Village Fund Cash Direct Assistance (BLT-DD). Along with the development of the Covid-19 pandemic, the rules for giving BLT-DD were changed. The aim of BLT-DD is to increase the income of poor families in the village. This step is to reduce extreme poverty to zero percent by 2024 [1].

Based on Minister of Finance Regulation Number 222/PMK.07/2020 concerning Village Fund Management [2], as well as Presidential Regulation (Perpres) Number 104 of 2021 [3], BLT-DD is limited to a minimum of 10 percent, and a maximum of 25 percent of the existing Village Fund budget. By fulfilling the requirements for BLT-DD recipients according to the rules, namely poor families who live in villages and are registered in the data for the Acceleration of Extreme Poverty Elimination (PPKE). In Cikaobandung Village after

carrying out the Special Village Consultation (MUSDESSUS) with all institutions. as many as 64 Beneficiary Families who will receive BLT-DD Extreme Poverty. Meanwhile, there are 207 families in the PPKE data.

Thus, data collection and surveys must be carried out directly to the recipient's house. Village officials work closely with the RT in the local village for prospective BLT-DD recipients of Extreme Poverty in accordance with the features and mechanisms that have been established to ensure that the assistance provided is fair and equitable. The problem that often occurs is that families selected as BLT-DD recipients do not meet the criteria, so that assistance is not provided to eligible families.

This problem requires a supporting decision system that assists the village government in determining beneficiaries of the Extreme Poverty BLT-DD. Decision support systems are part of a computer-based information system designed to help organizations or companies make decisions. They allow the system to make decisions by considering the considerations that have been included before [4].

Decision support systems exist in companies or organizations not to replace decision makers; instead, they turn data into information that can be used to make decisions about semi-structured problems[5] [6]. In operation, the outcome of a system's decisions does not become a yardstick; decision making remains with the decision maker[7]. The system only produces output from data calculations according to their considerations, making it easier for them to make decisions [8].

In a decision support system, there are many methods that can be used, one of which is the WASPAS method, the WASPAS method is a method that can reduce or optimize the selection of the highest and lowest values. The WASPAS method focuses more on completing the selection. To maximize the results of the WASPAS method, the author adds a weighting method using the ROC method. Previously, these two methods have been used. From the research on Analysis of the Best Scholarship Recipient Decision Support System Applying the Weight Aggregated Sum Product Assessment Method (WASPAS) with Rank Order Centroid (ROC) Weighting process that has been carried out using the ROC method in determining the weight of the criteria and the WASPAS method in determining the preference value, it can be concluded that this method can be used to assist in determining decisions in determining scholarship recipients who are eligible and not [9]. In previous research on the Decision Support System for Accepting Covid-19 Assistance using the Simple Additive Weighting (SAW) Method in Sundawira Village, it showed good results. These results can help parties in Sundawira Village reduce fraud when selecting or choosing targeted recipients of social assistance [10]. The results of this study show that the proposed model can be used well in the process of selecting laboratory assistants to hire. In this study, ROC can provide the right weighting of criteria based on their importance to the decision maker; the WASPAS method, on the other hand, can generate the best choices that the decision maker can use to help them [11].

The result of the recommendation for the selection of BLT in Sidaharja Village. has the highest score because he has the criteria for the income of the head of the household having the highest percentage of weight. The combination of the superiority of the income of the head of the household and the superiority of weight gives a high score [12]. and other research on the Decision Support System for the Performance Assessment of the Head of the WASPAS Method Drawing Study Program with ROC Weighting. Based on the research process, it can be concluded that the WASPAS method can be used to solve problems and get better results [13]. This research is expected to facilitate decision making using the ROC method in weighting and the WASPAS method in ranking the purchase of BLT-DD recipients of extreme poverty.

2. RESEARCH METHOD

2.1. Collection of Data

The data collection process began with making observations to Cikaobandung Village regarding BLT-DD Extreme Poverty then the Cikaobandung Village Secretary was interviewed directly to obtain the data and information needed for this research. The information collected from the interview was about BLT-DD Extreme Poverty. Other data came from documents or archives, such as data on BLT-DD recipients in 2021 and obtaining Data on Accelerating the Elimination of Extreme Poverty (PPKE). And conduct a literature study, which involves reading books and journals according to the data needed. In this study, the authors chose to collect references from books on Decision Support Systems, ROC Method, WASPAS Method, Direct Cash Assistance, and journals related to the creation of this system. The data that has been obtained will be analyzed according to the decision support system using the ROC method in weighting criteria and the WASPAS method in determining alternative rankings.

Data on the Acceleration of the Elimination of Extreme Poverty (PPKE) for Cikaobandung Village amounted to 207 households. with the results of the special village deliberation (MUSDESSUS), Determined 64 Beneficiary Families (KPM) of BLT-DD Extreme Poverty and the distribution of BLT Village Fund of Rp 300,000 / month per family for 12 months.

To give weight to each criterion, the Rank Order Centroid (ROC) method uses the priority level of the selection criteria. This method is very important for decision support systems. As a result, weighting must be done

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based on the Weighting Method reference [11]. Village Head as the decision maker to make the priority level of the selection criteria.

To solve Multi Criteria Decision Making (MCDM) problems, the Weight Aggregated Sum Product Assessment (WASPAS) method evaluates the optimal performance for each criterion, constructs a normalization matrix for each criterion, and then calculates the normalization matrix value. The WASPAS method has the ability to reduce errors by optimizing the assessment of low values and high values [14].

2.2. Decision Support System

A Decision Support System (DSS) is an interactive information system that provides information, modelling, and data processing. These systems are used to support decision-making in semi-structured situations and unstructured situations where no one knows exactly how the decision should be made [15].

Decision support systems are intended for decision makers as a tool to improve their skills, but they do not replace the judgment of the decision maker[16].

2.3. Rank Order Centroid (ROC) Method

The Rank Order Centroid (ROC) method is usually intended to determine the weight values of criteria and sub criteria. Criteria and sub-criteria that were originally sentences are converted into numerical values under the calculation conditions of the ROC method [11][17].

Rank Order Centroid (ROC) weighting is a method that focuses on the priority of the most important criteria. In this case criterion 1 has the highest priority compared to criterion 2, and criterion 2 has the highest priority compared to criterion 3, then the action is taken with the lowest priority criterion [18].

So that the importance of the criteria can be described as below:

$$C_{r1} \geq C_{r2} \geq C_{r3} \geq \ldots \geq C_{rm}$$

Where Cr is a criterion, we can see that Cr1 has a higher priority than Cr2, while Cr2 is definitely higher than Cr3, and so on until the last criterion or Crm. This then results in:

$$W_1 \geq W_2 \geq W_3 \geq \ldots \geq W_m$$

In general, the ROC weighting is formulated as follows:

$$W_k = \frac{1}{k}\sum_{i=1}^{k}\left(\frac{1}{k}\right)$$

When W is Criteria weighting value, K is Number of criteria and i is Alternative value [17].

The formula above can be explained as follows:

$$W1 = \frac{0+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{k}}{k}$$

$$W2 = \frac{0+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{k}}{k}$$

$$W3 = \frac{0+\frac{1}{2}+\frac{1}{3}+\cdots+\frac{1}{k}}{k}$$

$$Wk = \frac{0+0+0+\cdots+\frac{1}{k}}{k} \text{ (up to a criterion of k)}$$

2.4. Weight Aggregated Sum Product Assessment (WASPAS) Method

The WASPAS method is a combination of two models, namely the weighted sum model and the weighted product model which was first introduced by Zavadskas et al. in 2012 [11][19].

The WASPAS method is a method that can reduce errors or optimize estimates by selecting the highest and lowest values. The WASPAS method is currently very popular among researchers in the field of decision making because it provides accurate values [20][19].

The following steps of the WASPAS method are as follows:

1. Create a decision matrix

$$x = \begin{bmatrix} x_{11} & x_{12} & x_{1n} \\ x_{21} & x_{22} & x_{1n} \\ x_{m1} & x_{m2} & x_{mn} \end{bmatrix}$$

Description m is alternative and n is criteria [19].

2. Perform matrix normalization

If the benefit criteria

$$\bar{x}_{ij} = \frac{x_{ij}}{Max_i\, x_{ij}}$$

If the cost criterion

$$\bar{x}_{ij} = \frac{Min_i\, x_{ij}}{x_{ij}}$$

Description for formula, when x_{ij} is performance value of alternative i against criterion j, Max_i is the largest value of the alternative and Min_i is the smallest alternative value [19].

3. Calculating the value of Qi

$$Q_i = 0{,}5\ \sum_{j=1}^{n} x_{ij}\, w + 0{,}5\ \sum_{j=1}^{n} (x_{ij})\, wj$$

When x_{ij} w is multiplication of xij value with weight (w), (x_{ij}) is xij value multiplied by weight (w), 0.5 is formula determination value and Qi is value of Q to i [19].

4. Performing ranking

Ranking is done by looking at the results of the Qi value calculation. The largest value is determined to be the best alternative (Ai).

3. RESULTS AND DISCUSSION

In making this decision support system for BLT-DD Extreme Poverty recipients, first determine the criteria and sub-criteria that will be used in decision making. These criteria and sub-criteria were obtained from interviews with the Secretary of Cikaobandung Village which are shown in table 1 and table 2.

1. Criteria

The criteria for the decision support system to be created consider 10 criteria that have been prioritized by the Cikaobandung Village Secretary, code C1 as the criteria with the highest priority. A person or family can be considered poor and eligible to receive social assistance if they fulfill at least 9 criteria. After the PPKE data has been transformed, the criteria used in this study are shown in table of these criteria:

Table 1. Criteria

Code Criteria	Criteria	*Benefit/Cost*
C_1	Income of Head of Household	*Benefit*
C_2	Number of Dependents	*Cost*
C_3	House Ownership	*Benefit*
C_4	Cooking Fuel	*Cost*
C_5	Toilet Facilities	*Benefit*
C_6	Drinking Water Source	*Cost*
C_7	Family Head Education	*Benefit*
C_8	Electricity Power	*Cost*
C_9	Free insurance card	*Benefit*
C_{10}	Family Savings	*Benefit*

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2. Sub-Criteria

Each criterion has a different value, and the value is shown in the table:

Table 2. Sub-Criteria

Code	Criteria	Sub-Kriteria	Nilai
C1	Income of Head of Household	< Rp. 600.000,-	2
		> Rp. 600.000,-	1
C2	Number of Dependents	7-8 people	4
		5-6 people	3
		3-4 people	2
		1-2 people	1
C3	House Ownership	Contract/Rent	4
		Hitchhiking	3
		Owned	2
		Rent-free	1
C4	Cooking Fuel	Charcoal/Wood	3
		Kerosene	2
		Electricity/Gas	1
C5	Toilet Fasilities	No, public/shared latrine	3
		Yes, without Septic Tank	2
		Yes, with Septic Tank	1
C6	Drinking Water Source	Bottled/Refillable Water	1
		Tap/PAM	2
		Protected Well	4
C7	Family Head Education	High school graduate/equivalent	1
		Junior high school graduate/equivalent	2
		Graduated elementary school/equivalent	3
		Not graduated from elementary school / equivalent	4
C8	Electricity Power	Private Electricity > 900 Watts	3
		Private Electricity up to 900 Watts	2
		Shared Electricity	1
C9	Free Insurance Card	Yes	2
		No	1
C10	Family Savings	No	2
		Yes	1

3. Alternative

In this study using data from PPKE as a sample that will be tested as much as 5 pieces of data. The data is obtained from the village government. Can be seen in the following table:

Table 3. Alternative

No	Head of Family	Gender	Address
1	SURADI PERMANA	Male	Kp. Cikao I
2	IBRO	Male	Kp. Talibaju
3	MUKSIN	Male	Kp. Batulayang
4	RASMAN	Male	Kp. Talibaju
5	SUNARDI	Male	Kp. Batulayang

3.1.1. Calculation of Rank Order Centroid (ROC) Method

After determining the number of criteria can be seen in Table 1, the ROC method process begins by determining the most superior and very important criteria that must be met to get the criteria value. The results of using the ROC method are as follows:

Table 4. Calculation ROC Method

Criteria	Priority	Calculation process
Income of Head of Household	1	$= \frac{1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}2929$
Number of Dependents	2	$= \frac{0+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}1929$
House Ownership	3	$= \frac{0+0+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}1429$
Cooking Fuel	4	$= \frac{0+0+0+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}1096$
Toilet Facilities	5	$= \frac{0+0+0+0+\frac{1}{5}+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}0846$
Drinking Water Source	6	$= \frac{0+0+0+0+0+\frac{1}{6}+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}0646$
Family Head Education	7	$= \frac{0+0+0+0+0+0+\frac{1}{7}+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}0479$
Electricity Power	8	$= \frac{0+0+0+0+0+0+0+\frac{1}{8}+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}0336$
Free insurance card	9	$= \frac{0+0+0+0+0+0+0+0+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}0211$
Family Savings	10	$= \frac{0+0+0+0+0+0+0+0+\frac{1}{9}+\frac{1}{10}}{10} = 0{,}01$

The result of the weight when added up is worth 1, to make it easier to read the weight value, it can be seen in the following table:

Table 5. Result Criteria

Code	Criteria	Weight
C_1	Income of Head of Household	0,2929
C_2	Number of Dependents	0,1929
C_3	House Ownership	0,1429
C_4	Cooking Fuel	0,1096
C_5	Toilet Facilities	0,0846
C_6	Drinking Water Source	0,0646
C_7	Family Head Education	0,0479
C_8	Electricity Power	0,0336
C_9	Free insurance card	0,0211
C_{10}	Family Savings	0,01

3.2. Calculation of Weight Aggregated Sum Product Assessment (WASPAS) Method

After the process of weighting the criteria with the ROC method is complete, the process of forming results for the decision support system. Before the process begins, the value of each criterion is entered against the alternatives. The assessment for each alternative is shown in the following table:

Table 6. Alternative Value

No	Kepala Keluarga	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
1	SURADI	1	3	3	1	2	2	1	2	2	2
2	IBRO	1	3	2	1	1	2	2	2	2	2
3	MUKSIN	1	3	2	3	2	3	3	2	2	2
4	RASMAN	1	2	2	1	1	2	4	2	2	2
5	SUNARDI	2	4	2	1	2	3	3	2	1	1

From this assessment data above, which will be processed using the WASPAS Method in stages. The first step in performing calculations using the WASPAS Method is to create a decision matrix based on the weighting of the sub criteria shown in the table above. Then the value is normalized, if the benefit or cost with the formula:

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Table 7. Normalized Table

No	Kepala Keluarga	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
1	SURADI	0,50	0,67	1	1	1	1	0,25	1	1	1
2	IBRO	0,50	0,67	0,67	1	0,50	1	0,50	1	1	1
3	MUKSIN	0,50	0,67	0,67	0,33	1	0,67	0,75	1	1	1
4	RASMAN	0,50	1	0,67	1	0,50	1	1	1	1	1
5	SUNARDI	1	0,50	0,67	1	1	0,67	0,75	1	0,50	0,50

The next step is to calculate the preference value (Qi Value) with the following formula:

$$Q1 = 0.5\sum\big((0{,}50 * 0.2929) + (0{,}67 * 0.1929) + (1 * 0.1429) + (1 * 0.1096) + (1 * 0.0846) + (1 * 0.0646) + (0{,}25 * 0.479) + (1 * 0.0336) + (1 * 0.0211) + (1 * 0.01)\big) + 0.5\prod \begin{matrix}((0{,}50^{0.2929})(0{,}67^{0.1929})(1^{0.1429})(1^{0.1096})(1^{0.0846}) \\ (1^{0.0646})(0{,}25^{0.0479})(1^{0.0336})(1^{0.0211})(1^{0.01}))\end{matrix}$$

$$= \mathbf{0.6593}$$

$$Q2 = 0.5\sum\big((0.50 * 0.2929) + (0{,}67 * 0.1929) + (0.67 * 0.1429) + (1 * 0.1096) + (0.50 * 0.0846) + (1 * 0.0646) + (0.50 * 0.479) + (1 * 0.0336) + (1 * 0.0211) + (1 * 0.01)\big) + 0.5\prod \begin{matrix}((0.50^{0.2929})(0.67^{0.1929})(0.67^{0.1429})(1^{0.1096})(0.50^{0.0846}) \\ (1^{0.0646})(0.50^{0.0479})(1^{0.0336})(1^{0.0211})(1^{0.01}))\end{matrix}$$

$$= \mathbf{0.5860}$$

$$Q3 = 0.5\sum\big((0.50 * 0.2929) + (0.67 * 0.1929) + (0{,}67 * 0.1429) + (0.33 * 0.1096) + (1 * 0.0846) + (0.67 * 0.0646) + (0.75 * 0.479) + (1 * 0.0336) + (1 * 0.0211) + (1 * 0.01)\big) + 0.5\prod \begin{matrix}((0.50^{0.2929})(0.67^{0.1929})(0{,}67^{0.1429})(0.33^{0.1096})(1^{0.0846}) \\ (0.67^{0.0646})(0.75^{0.0479})(1^{0.0336})(1^{0.0211})(1^{0.01}))\end{matrix}$$

$$= \mathbf{0.5491}$$

$$Q4 = 0.5\sum\big((0{,}50 * 0.2929) + (1 * 0.1929) + (0{,}67 * 0.1429) + (1 * 0.1096) + (0{,}50 * 0.0846) + (1 * 0.0646) + (1 * 0.479) + (1 * 0.0336) + (1 * 0.0211) + (1 * 0.01)\big) + 0.5\prod \begin{matrix}((0{,}50^{0.2929})(1^{0.1929})(0{,}67^{0.1429})(1^{0.1096})(0{,}50^{0.0846}) \\ (1^{0.0646})(1^{0.0479})(1^{0.0336})(1^{0.0211})(1^{0.01}))\end{matrix}$$

$$= \mathbf{0.6565}$$

$$Q5 = 0.5\sum\big((1 * 0.2929) + (0.50 * 0.1929) + (0{,}67 * 0.1429) + (1 * 0.1096) + (1 * 0.0846) + (0.67 * 0.0646) + (0.75 * 0.479) + (1 * 0.0336) + (0{,}50 * 0.0211) + (0{,}50 * 0.01)\big) + 0.5\prod \begin{matrix}((1^{0.2929})(0.50^{0.1929})(0{,}67^{0.1429})(1^{0.1096})(1^{0.0846}) \\ (0.67^{0.0646})(0.75^{0.0479})(1^{0.0336})(0{,}50^{0.0211})(0{,}50^{0.01}))\end{matrix}$$

$$= \mathbf{0.7276}$$

The final results in the calculation process where the alternative value of the beneficiary is processed using the Weight Aggregated Sum Product Assessment (WASPAS) method and get the final result value in the calculation as above, following the table below.

Table 8. Calculation Result

No	Kepala Keluarga	Hasil
1	SURADI PERMANA	0,6593
2	IBRO	0,5860
3	MUKSIN	0,5491
4	RASMAN	0,6565
5	SUNARDI	0,7276

As mentioned earlier, there are several requirements that greatly affect the likelihood of an applicant receiving assistance. BLT-DD Extreme Poverty has criteria for income, number of dependents, house ownership, cooking fuel, toilet facilities, drinking water source, education, electricity, health insurance, and savings, with income as the highest weighted value, so income greatly influences the data selection. So, the smaller the income, the greater the possibility of receiving assistance.

The final result of the WASPAS method calculation shows that the beneficiaries who received more recommendations than other beneficiaries based on their ranking order. The Village Secretary enters each value on the criteria, the ideal value on the sub criteria into the system. The ranking order and the list of values displayed by the system can help in determining the recipients of the assistance program provided by the Village.

The results of research conducted on a decision support system that uses the Rank Order Centroid (ROC) method and the Weight Aggregated Sum Product Assessment (WASPAS) method to determine recipients of Extreme Poverty Direct Cash Assistance (BLT) in Cikaobandung Village show that the combination of the ROC and WASPAS methods in this system has succeeded in calculating and processing data so that it meets the predetermined criteria. with a sample of five BLT recipients, who were then ranked. From the results of the calculation, it can be seen that Sunardi gets the highest value of 0.7276 and Muksin gets the lowest value of 0.5491. It can be concluded that if the number of beneficiaries is 3 then the rank is taken according to the number of beneficiaries.

4. CONCLUSION

From the results of the research that has been done above, it is clear that the combination of the ROC and WASPAS methods in a decision support system for determining vendor cooperation provides good results and is free from paradigms or subjective assessments of decision makers. The use of the ROC and WASPAS methods provides a ranking of each alternative that can be selected, but this system only helps decision-makers as reference material. decision-makers as reference material. The final decision remains with the decision-maker. The results of this system cannot absolutely change the decisions of the decision-makers.

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REFERENCES

[1] Republik Indonesia, "Undang-Undang Nomor 6 Tahun 2014 Tentang Desa," *Antimicrob. Agents Chemother.*, no. 1, 2014.

[2] Republik Indonesia, "Peraturan Menteri Desa PDTT Nomor 8 tahun 2022 tentang Prioritas Penggunaan Dana Desa tahun 2023," *Antimicrob. Agents Chemother.*, vol. 58, no. 12, pp. 7250–7257, 2022, [Online]. Available: https://medium.com/@arifwicaksanaa/pengertian-use-case-a7e576e1b6bf

[3] Republik Indonesia, "INSTRUKSI PRESIDEN REPUBLIK INDONESIA NOMOR 4 TAHUN 2022 TENTANG PERCEPATAN PENGHAPUSAN KEMISKINAN EKSTREM," *Instr. Pres. REPUBLIK Indones. NOMOR 4 TAHUN 2022 TENTANG PERCEPATAN PENGHAPUSAN Kemiskin. EKSTREM*, no. 146187, 2022.

[4] G. S. Mahendra *et al.*, *SISTEM PENDUKUNG KEPUTUSAN (Teori dan Penerapannya dalam berbagai Metode)*. PT. Sonpedia Publishing Indonesia, 2023. [Online]. Available: https://books.google.co.id/books?id=Vzy2EAAAQBAJ&lpg=PP1&ots=RcQI-Sh4II&dq=info%3AzJZKuXEVlhsJ%3Ascholar.google.com&lr&pg=PA7#v=onepage&q&f=false

[5] J. Kuswanto, M. N. Al Kodri, T. Devana, L. Pebriantika, and S. Ningsih, "Implementation of Simple Additive Weighting For Scholarship Admission Selection," vol. 4, no. 1, 2023, doi:

.

10.38043/tiers.v4i1.4022.

[6] Qiyamullaily Arista, 7–12.ari Silvia NandasQiyamullaily Arista, Nandasari Silvia, & Amrozi Yusuf. (2020). Perbandingan Penggunaan Metode Saw Dan Ahp Untuk Sistem Pendukung Keputusan Penerimaan Karyawan Baru. Teknika : Engineering and Sains Journal, 4, and Amrozi Yusuf, "Perbandingan Penggunaan Metode Saw Dan Ahp Untuk Sistem Pendukung Keputusan Penerimaan Karyawan Baru," *Tek. Eng. Sains J.*, vol. 4, pp. 7–12, 2020.

[7] A. Küper, G. Lodde, E. Livingstone, D. Schadendorf, and N. Krämer, "Mitigating cognitive bias with clinical decision support systems: an experimental study," *J. Decis. Syst.*, pp. 1–20, Aug. 2023, doi: 10.1080/12460125.2023.2245215.

[8] M. G. Resmi, M. R. Muttaqin, and M. Defriani, "PENENTUAN PENERIMAAN BANTUAN PANGAN NONTUNAI DENGAN METODE SIMPLE ADDITIVE WEIGHTED," *J. Inf. Technol. Comput. Sci.*, vol. 4, pp. 40–46, 2021.

[9] Y. Sopyan and A. D. Lesmana, "Analisis Sistem Pendukung Keputusan Penerima Beasiswa Terbaik Menerapkan Metode Weight Aggregated Sum Product Assesment (WASPAS) dengan Pembobotan Rank Order Centroid (ROC)," vol. 4, no. 3, pp. 1334–1342, 2022, doi: 10.47065/bits.v4i3.2525.

[10] F. Sembiring, M. T. Fauzi, S. Khalifah, A. K. Khotimah, and Y. Rubiati, "Sistem Pendukung Keputusan Penerima Bantuan Covid 19 menggunakan Metode Simple Additive Weighting (SAW) (Studi Kasus : Desa Sundawenang)," *Explor. Sist. Inf. dan Telemat.*, vol. 11, no. 2, p. 97, 2020, doi: 10.36448/jsit.v11i2.1563.

[11] A. Aditiya and Gunawansyah, "Sistem Pendukung Keputusan Penerimaan Perawat Baru Di PT. Medika Antapani dengan Pembobotan ROC dan Metode WASPAS," *G-Tech J. Teknol. Terap.*, vol. 6, no. 2, pp. 149–158, 2022, doi: 10.33379/gtech.v6i2.1599.

[12] S. A. Amanatulloh and S. Wibisono, "Sistem Pendukung Keputusan Pemberian BLT Desa Sidaharja Dengan Metode WASPAS," vol. 15, no. 1, pp. 171–179, 2022.

[13] M. B. K. Nasution, K. Kusmanto, A. Karim, and S. Esabella, "Sistem Pendukung Keputusan Penilaian Kinerja Ketua Program Studi Menerapkan Metode WASPAS dengan Pembobotan ROC," *Build. Informatics, Technol. Sci.*, vol. 4, no. 1, pp. 130–136, 2022, doi: 10.47065/bits.v4i1.1619.

[14] K. A. Chandra and S. Hansun, "Sistem Rekomendasi Pemilihan Laptop Dengan Metode Waspas," *J. Ecotipe (Electronic, Control. Telecommun. Information, Power Eng.*, vol. 6, no. 2, pp. 76–81, 2019, doi: 10.33019/ecotipe.v6i2.1019.

[15] M. E. Fitria and M. Siddik, "Penerapan Metode MFEP Berbasis Web Pada Sistem Pendukung Keputusan Penilaian Kompetensi Soft Skill Pegawai," vol. 4, no. 2, pp. 684–693, 2022, doi: 10.47065/bits.v4i2.2060.

[16] S. Supiyandi, C. Rizal, M. N. H. Siregar, E. Putra, and R. Saragih, "Sistem Pendukung Keputusan Pemilihan Biji Kopi Arabika Terbaik Menggunakan Metode SMART," *Build. Informatics, Technol. Sci.*, vol. 4, no. 2, pp. 796–802, 2022, doi: 10.47065/bits.v4i2.2118.

[17] D. Liu, T. Li, and D. Liang, "An integrated approach towards modeling ranked weights," *Comput. Ind. Eng.*, vol. 147, p. 106629, 2020, doi: https://doi.org/10.1016/j.cie.2020.106629.

[18] A. Iskandar, "Sistem Pendukung Keputusan Kelayakan Penerima Bantuan Dana KIP Kuliah Menggunakan Metode ROC-EDAS," *Build. Informatics, Technol. Sci.*, vol. 4, no. 2, pp. 856–864, 2022, doi: 10.47065/bits.v4i2.2265.

[19] A. Alinezhad and J. Khalili, *New Methods and Applications in Multiple Attribute Decision Making (MADM)*. Springer International Publishing, 2019. [Online]. Available: https://books.google.co.id/books?id=9OmqDwAAQBAJ

[20] C. Lukita, C. Nas, and W. Ilham, "Analisis Perbandingan Metode MOORA dan Metode WASPAS Dalam Pendukung Keputusan Penentuan Prioritas Utama Peningkatan Kualitas Mata Pelajaran," *J. Nas. Teknol. dan Sist. Inf.*, vol. 5, no. 3, pp. 130–137, 2020, doi: 10.25077/teknosi.v5i3.2019.130-137.