An Intelligent Decision-Making System for Prospective Recipients of Cash Transfer (*Bantuan Langsung Tunai*) Using Simple Additive Weighting (SAW) Method

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Abstract

Bantuan Langsung Tunai (BLT) or cash transfer is the government's commitment to help underprivileged communities, and to improve the economy along with improving the quality of life of underprivileged families. With BLT, it can help people to meet their daily needs. The responsibility of the government, especially in rural areas, is a problem which must be faced by the village administration, especially the village head. The village head has a responsibility towards the people in the village, and the village head is a government official at the village level who is tasked with distributing BLT. BLT funds are sourced from the Village Fund which has been distributed by the central government to help village communities affected by an unstable economy. This research was conducted with the aim of determining prospective recipients of BLT using the Simple Additive Weighting (SAW) method. The Simple Additive Weighting method is used because this method connects attribute values, where the value must be raised to the power of the attribute's weight value. In determining the recipient of BLT, there are many criteria which must be owned by the Community as a condition for obtaining BLT. The criteria used are the size of the house, floors, walls, toilet facilities, house electricity, water sources, cooking fuel, consumption of meat, clothing, and the number of meals per day. The recipients of BLT amounted to 29 households from 50 families. From the results of the 50 Alternative Tests, the results of V_1 with a value above 0.5 as the alternative were selected as recipients of direct cash assistance.

Keywords: *Bantuan Langsung Tunai* (BLT), Simple Additive Weighting (SAW)

I. INTRODUCTION

The rapid development of science makes it possible to continue to make good decisions. Decision making must be carried out quickly, thoroughly, on target, and can be accounted for so that it becomes the key to successful decision making in the future. This is the problem faced by the village government in determining potential BLT recipients for the people of a village. BLT is the government's commitment to help people whose economies have been affected by a prolonged pandemic, so that with this assistance it is hoped that it can ease people's daily needs. *Bantuan Langsung Tunai* (cash transfers) or abbreviated as BLT are government assistance programs in the form of giving cash or various other assistance, both conditional (conditional cash transfers) and unconditional (unconditional cash transfers) to the poor [1], [2]. In PMK 40/2020, BLT is the provision of cash to poor or incapacitated families in villages originating from the Village Fund to reduce the economic impact due to the Corona Virus Disease 2019 (COVID-19) pandemic [2]. In providing assistance to the community, the village government concerned must be more selective so that there are no complaints from the community about assistance which is not as expected and not on target.

The problem faced is that there are many village government elements who misappropriate assistance and the provision of assistance is not on target because the village government did not conduct a survey and study it. Making a Decision Support System is good for dealing with this problem, because it can take into account all the criteria used. In Decision Support System, the solutions given and displayed are suggestions in the form of ratings. The method used by researchers in this study is the Simple Additive Weighting (SAW) method. This method can be used to determine decisions because it can produce the greatest value to be selected as a candidate for BLT recipients. Decision making can be easier and can be an alternative in determining BLT. Based on the background of these problems, this research creates a Decision Support System which can help make decisions. This Decision Support System is expected to be able to reduce the misuse of BLT and the delivery of assistance can be right on target because in

providing assistance a decision is made beforehand. It is also hoped that this assistance will prosper the village community so that they can survive during the pandemic. With this system, it will be easier for the village government to calculate the appropriate recipients of assistance. So that with this assistance, it can alleviate the economic needs of the less fortunate.

II. THEORETICAL BASIS

A. Decision Support System

The Decision Support System (DSS) was first described in the early 1970s by Michael S. Scott Morton with the term Management Decision System. The system is a computer-based system which is intended to help make decisions by utilizing certain data and models to solve various unstructured problems[2]

B. Stage of Decision Making in Decision Support System

The stages of decision making according to Herbert A. Simon which must be passed in the decision-making process are [2][1]
Understanding Stage (Intelligence Phase).
This stage is the process of tracing and detecting the problematic scope and the process of identifying problems. Input data is obtained, processed and tested in order to identify problems.

1. Design Phase
   This stage is the process of developing and searching for alternative actions/ solutions which can be taken. This stage is a simplified representation of real events, so a validation and verification process is needed to determine the accuracy of the model in examining existing problems.
2. Choice Phase
   At this stage, selection is made among various alternative solutions which are raised at the planning stage so that they are determined by taking into account the criteria based on the objectives to be achieved.
3. Implementation Phase
   At this stage, the implementation of the system design which is made at the design stage and the implementation of alternative actions which have been selected at the selection stage are carried out.

C. Simple Additive Weighting (SAW)

Simple Additive Weighting (SAW) method is often also known as the weighted sum method[3][4]. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all attributes. SAW method requires a process of normalizing the decision matrix (X) to a scale which can be compared with all existing alternative ratings. This method is the most well-known and most widely used method in dealing with Multiple Attribute Decision Making (MADM) situations[5][6]–[10]. MADM itself is a method used to find optimal alternatives from a number of

alternatives with certain criteria. SAW method requires the decision maker to determine the weight for each attribute. The total score for the alternative is obtained by adding up all the multiplication results between the rating (which can be compared across attributes) and the weight of each attribute. The rating of each attribute must be dimension-free in the sense that it has gone through the previous matrix normalization process[11]–[14]. The steps in solving Simple Additive Weighting (SAW) are:

1. Determine the criteria which will be used as a reference in decision making (C).
2. Determine the suitability rating of each alternative on each criterion.
3. Make a decision matrix based on criteria (C), then normalize the matrix based on the equation adjusted for the type of attribute (benefit attribute or cost attribute) so that a normalized matrix R is obtained.

$R_{ij} = X_{ij}/MaxX_{ij}$, Benefit Gain Attributes
$R_{ij} = MinX_{ij}/2!$ Cost Attribute (Cost)

Information:
R_{ij} = Normalized performance rating value
X_{ij} = Attribute values owned by each criterion
Max X_{ij} = the greatest value of each criterion i
Min X_{ij} = the smallest value of each criterion i
Benefit = If the greatest value is best
Cost = If the smallest value is the best

The final result obtained from the ranking process is the sum of the multiplication of the normalized matrix R with the weight vector so that the largest value is selected as the best alternative (A) as a solution.

$$V_i = \sum_{j=1}^{n} W_J\, r_{ij}$$

Information:
V_i = Rank for each alternative
W_J = the weight value of each criterion
r_{ij} = Normalized performance rating value

D. Bantuan Langsung Tunai

The early history of the birth of BLT was in 2004. The Indonesian government ensured that Covid-19 was very dangerous for Indonesia and the whole world which was getting sharper in 2020. And now the government is implementing the BLT program again through Presidential Instruction Number 3 of 2020 (Inpres 3/2020) dated August 29, 2020 in the implementation of BLT program for target households. The unconditional BLT program carried out by the government in 2020 is shown to the public for those affected by COVID-19. Then the government created a program policy so that this BLT could help the poor who were affected by COVID-19 in meeting the needs of the community during the pandemic. The amount received by the community is Rp.600.000 - for the first 3 months and Rp.300.000 - for five months thereafter.

The BLT program was an idea that was born from the then Vice President Jusuf Kalla after winning the 2004 election with President Susilo Bambang Yudhoyono, the Executive, referring to Presidential order number 12 of 2005 to move the BLT program unconditionally from October 2005 to December 2006. BLT is a social security net in order to minimize the impact of COVID-19 on the poor to fulfill their daily needs. Then, too, the government provides rice assistance to the poor as stated in the food stability policy issued by the government. BLT program is a form of program which is be carried out by the government as a result of COVID-19. In addition, the community also receives food commodity assistance in the form of rice and eggs. This BLT is still accompanied by the ongoing poverty alleviation program, rice for the poor (*Raskin*) [2].

III. RESEARCH METHODS

3.1. Method of collecting data

Interview

Interview is a method of collecting data by way of verbal question and answer unilaterally which is done systematically and based on research objectives. The authors collect data by conducting direct interviews and obtaining data in the form of several residents who have not yet received BLT. In Wonomerto Village, North Kotabumi District, North Lampung Regency, there were 20 heads of families who did not receive BLT. Interviews were conducted to explore sources of supporting knowledge in conducting analysis.

Literature review

Methods Literature review research is carried out by connecting research with existing literature such as research results, journals on BLT, and Simple Additive Weighting (SAW) as well as books on Decision Support Systems related to the research being carried out. Through a literature review, a review of the laws and regulations related to BLT's obligations and responsibilities was carried out.

Observation

Observation is a data collection technique by making direct observations of the object under study with the aim of getting a clear picture of the determination of BLT recipients which is given directly to villagers or through village staff. In this case the researchers focused on providing assistance to village communities in detail.

3.2. Simple Additive Weighting (SAW) Method Criteria and Weighting Value

Determine the criteria and weight values for BLT recipients for village residents. Recipients of assistance must be in accordance with what is determined by the aid provider [15].

Table 1. Weighting Criteria

Code	Criteria	Benefit	Cost
C1	Size of Land Area	-	✓
C2	House floor	-	✓
C3	House wall	-	✓
C4	MCK facilities	-	✓
C5	Home Electrical Power Measures	-	✓
C6	Water sources	-	✓
C7	Cooking Fuel	-	✓
C8	Consumption of Meat	-	✓
C9	Clothes	-	✓
C10	Number of Meals / Day	-	✓

Source: Data processed in 2021

From each of these weighting criteria, the weight values of each alternative are determined for each criterion to show the suitability rating of each alternative or criterion which is assessed with numbers 1 to 5.
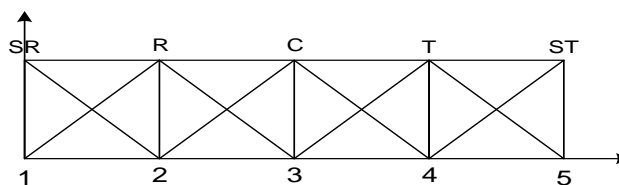

Figure 1. Weight value or criteria

3.3 Research Framework

The research framework is a temporary explanation of a symptom of the problem object being faced. The research framework in the Intelligent System for Determining Prospective BLT Recipients using the Simple Additive Weighting method is:
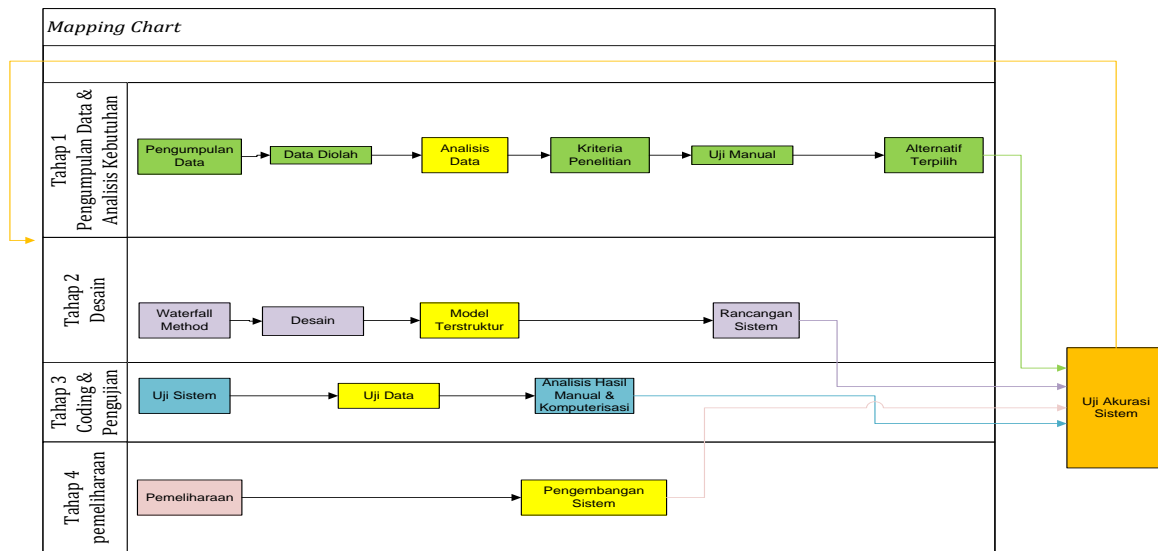
Figure 2. Research Framework

Mapping Charts

1. The first stage

   In the first stage, an analysis of the needs of software, hardware, brain device is carried out and data collection is carried out using the methods of observation, interviews, documentation, literature study and questionnaires to find deficiencies in the running system. After analyzing and collecting data and knowing the weaknesses of the current system, a new system is proposed.

2. The second stage

   In the second stage, the system design is carried out using the waterfall method and structured diagrams, then the system design process is carried out using Context and DFD diagrams, as well as specifying the appearance. In the design process, a proposed new system design drawing can cover the weaknesses of the current system.

3. he third stage

   In the third stage, coding and testing are carried out. At this stage, the criteria and criteria weights are entered into the new system by translating the description of the system which is designed in the second stage. After the input is complete and data validation is complete, a system test is carried out whether the system which has been designed is in accordance with the design and there are still errors or not, and whether the system can be used by stakeholders.

4. The fourth stage

   In the fourth stage, maintenance is carried out on a system which has already been implemented. Maintenance also includes fixing errors which are not found in the previous step. After an error is found, an update process is carried out until the system can meet user needs.

Table 2. Alternative Data

NO	NAMA	KRITERIA									
		Ukuran Rumah (C1)	Lantai Rumah (C2)	Dinding Rumah (C3)	Fasilitas MCK (C4)	Daya Listrik (C5)	Sumber Air (C6)	Bahan Bakar (C7)	Konsumsi Daging (C8)	Pakaian (C9)	Jumlah Makan (C10)
1	Sutono	4X6 M	Semen	Kayu	Sungai	450 VA	Sungai	Kayu Bakar	4 Minggu 1 x	1 stel / tahun	2x1
2	Suroyo	7X7 M	Keramik	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Gas	2 Minggu 1 x	2 stel / tahun	3x1
3	Dewi Agustin	4X6 M	Tanah	Kayu	Sungai	Tanpa PLN	Sungai	Kayu Bakar	4 Minggu 1 x	1 stel / tahun	2x1
4	Sujari	7X7 M	Semen	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Gas	2 Minggu 1 x	2 stel / tahun	3x1
5	Edi Jusaidi	4X6 M	Semen	Kayu	WC Umum	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	1 stel / tahun	2x1
6	Jaja	7X7 M	Keramik	Tembok Di plaster	Sungai	450 VA	Sumur	Gas	4 Minggu 1 x	2 stel / tahun	3x1
7	Ismanto Rudi	4X6 M	Tanah	Kayu	WC Dalam Rumah	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1
8	Suparni	7X7 M	Semen	Tembok Di plaster	Sungai	450 VA	Sumur	Gas	4 Minggu 1 x	2 stel / tahun	3x1
9	Mahmuddin	4X6 M	Semen	Kayu	WC Dalam Rumah	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	1 stel / tahun	2x1
10	S.Herlina	7X7 M	Semen	Tembok Di plaster	WC Umum	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	2 stel / tahun	3x1
11	Sumarli	4X6 M	Keramik	Kayu	Sungai	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1
12	Sugianto	7X7 M	Tanah	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Gas	4 Minggu 1 x	2 stel / tahun	3x1
13	Sumariyati	4X6 M	Semen	Bambu	Sungai	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	1 stel / tahun	2x1
14	Dwi Putri Handayani	7X7 M	Keramik	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	2 stel / tahun	3x1
15	Ponisman	4X6 M	Tanah	Kayu	WC Umum	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1
16	Ahmad Basori	7X7 M	Semen	Tembok Tidak diplaster	Sungai	450 VA	Sumur	Gas	4 Minggu 1 x	2 stel / tahun	3x1
17	Bejo Sunarto	7X7 M	Semen	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1
18	Nana Suryana	4X6 M	Keramik	Kayu	Sungai	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	2 stel / tahun	3x1
19	Suprihatini	7X7 M	Tanah	Tembok Di plaster	WC Dalam Rumah	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1
20	Eni Suwarti	4X6 M	Semen	Kayu	WC Umum	450 VA	Sumur	Kayu Bakar	4 Minggu 1 x	2 stel / tahun	3x1
21	Anisa Oktaviana	7X7 M	Semen	Tembok Di plaster	Sungai	450 VA	Sumur	Gas	4 Minggu 1 x	1 stel / tahun	2x1

To solve the problem with the Simple Additive Weighting method, determine the criteria which are used as a reference in making decisions, the criteria which are used to determine potential recipients of BLT to residents.

Table 2. Code and Weighting Criteria

Code	Criteria	Weight Value (%)
C1	Size of Land Area	10
C2	House floor	10
C3	House wall	10
C4	MCK facilities	10
C5	Home Electrical Power Measures	10
C6	Water sources	10
C7	Cooking Fuel	10
C8	Consumption of Meat	10
C9	Clothing	10
C10	Number of Meals / Day	10

Table 3. Size of Land Area (C1)

Sub Criteria	Quality
12 X 12 M	5
10 X 10 M	4
8 x 8 M	3
7 x 7 M	2
4 x 6 M	1

Table 4. House Floor (C2)

Sub Criteria	Quality
Ceramics	5
Cement	4
Wood	3
Bamboo	2
Land	1

Table 5. House Wall (C3)

Sub Criteria	Quality
Walls in plaster	5
The walls are not plastered	4
Wood	3
Rumbia	2
Bamboo	1

Table 6. MCK facilities (C4)

Sub Criteria	Quality
Indoor toilet	5
Outdoor toilet	4
Restroom	3
Garden	2
River	1

Table 7. Home Electrical Power Measures (C5)

Sub Criteria	Quality
2300 VA	5
1200 VA	4
900 VA	3
450 VA	2
Without PLN	1

Table 8. Water Source (C6)

Sub Criteria	Quality
Drill	5
PDAM	4
Well	3
Rainwater	2
River	1

Table 9. Cooking Fuel (C7)

Sub Criteria	Quality
Gas	5
Coal	4
Kerosene	3
Charcoal	2
Firewood	1

Table 10. Meat Consumption (C8)

Sub Criteria	Quality
Every day	5
Once in 1 week	4
Once in 2 weeks	3
Once in 3 weeks	2
Once in 4 weeks	1

Table 11. Clothing (C9)

Sub Criteria	Quality
5 sets per year	5
4 sets per year	4
3 sets per year	3
2 sets per year	2
1 set per year	1

Table 12. Number of meals per day (C10)

Sub Criteria	Quality
5x per day	5
4x per day	4
3x per day	3
2x per day	2
1x per day	1

IV. RESULTS AND DISCUSSION
4.1. Manual Test

In this study, the first step taken in the settlement is to determine alternatives with predetermined criterion values. This study uses 50

alternatives. Before performing the calculations, normalization is carried out with the following equation formula:

$$R_{ij} = (Min \ \frac{Xij}{Xij} \ )$$

If j is the attribute cost (4), the form for calculating the normalization of R is:

$$W_2 = \frac{Min(1,2,1,3,2,4 \ dst)}{1} = \frac{1}{1} = 1$$

4.2. Ranking

The next step is to determine the ranking. by the sum of the multiplication of the normalized matrix R with the weight vector so that the largest value is selected to be the best value (Ai). As a solution, the preference value of each alternative (Vi) with the equation is:

$$V_i = \sum Wij.Rij \qquad (5)$$

$V_1 = (0,1).(1) + (0,1).(0.3) + (0.1).(0.3) + (0.1).(0.2) + (0,1).(0.5) + (0,1).(1) + (0,1).(1) + (0,1).(0.6) + (0.1).(1) + (0.1).(1) \ = 0.69$

$V_2 = (0,1).(0.5) + (0,1).(1) + (0.1).(0.2) + (0.1).(0.2) + (0,1).(0.5) + (0,1).(0.3) + (0,1).(1) + \quad (0,1).(1) + (0.1).(0.5) + (0.1).(0.6) \ = 0.59$

$V_3 = (0,1).(1) + (0,1).(1) + (0.1).(0.3) + (0.1).(1) + (0,1).(1) + (0,1).(0.2) + (0,1).(0.2) + (0,1).(0.6) + (0.1).(1) + (0.1).(1) \ = 0.73$

$V_4 = (0,1).(0.5) + (0,1).(0.25) + (0.1).(0.2) + (0.1).(0.2) + (0,1).(0.5) + (0,1).(0.3) + (0,1).(1) + (0,1).(1) + (0.1).(0.5) + (0.1).(0.6) \ = 0.51$

$V_5 = (0,1).(1) + (0,1).(0.25) + (0.1).(0.3) + (0.1).(0.3) + (0,1).(0.5) + (0,1).(0.3) + (0,1).(0.2) + \ (0,1).(0.6) + (0.1).(1) + (0.1).(1) \ = 0.55$

V6-V48………………

$V_{49} = (0,1).(0,3) + (0,1).(0.2) + (0.1).(0.2) + (0.1).(1) + (0,1).(0,25) + (0,1).(1) + (0,1).(1) + (0,1).(1) + (0.1).(0,25) + (0.1).(0,5) \ = 7.14$

$V_{50} = (0,1).(1) + (0,1).(0.0001) + (0.1).(0.01) + (0.1).(0.3) + (0,1).(0,5) + (0,1).(0,3) + (0,1).(0,2) + (0,1).(0,75) + (0.1).(0,5) + (0.1).(1) \ = 2.32$

From the calculation results, to determine which BLT recipient families with suitable criteria are recommended to receive BLT, see the calculation results above. Those who are entitled to receive assistance are those who score above 0.5 which is the chosen alternative for BLT. Furthermore, from the

results of the manual test above, an indicator for a list of prospective BLT recipients is made. Based on the provisions, the head of the family fulfills the requirements for giving BLT if the value is > 0.55. The head of the family who does not meet the requirements for giving BLT if the value is 0.01 - 0.54.

V. CONCLUSION
5.1. Conclusion

Based on the research conducted, an intelligent system for determining prospective BLT recipients uses Simple Additive Weighting (SAW) method. The conclusion which can be drawn is that the results of calculating the determination of prospective BLT recipients are the priorities needed as material for consideration in determining the head of a family who is entitled to receive BLT. From the results of the manual test using the SAW method, it will then be developed using a website programming language so that alternative testing will be easier, faster, more precise and efficient.

5.2. Suggestion

REFERENCES

[1] E. Turban, R. Sharda, dan D. Delen, *Decision Support and Business Intelligence Systems. Chapter 6 Artificial Neural Networks for Data Mining*, vol. 8th. 2007.

[2] E. Turban, J. E. Aronson, dan T.-P. Liang, "Decision Support Systems and Intelligent Systems," *Decis. Support Syst. Intell. Syst.*, vol. 7, hal. 867, 2007.

[3] S. Kusumadewi, S. Hartati, A. Harjoko, dan Retanto Wardoyo, *Fuzzy Multi-Attribute Decision Making (Fuzzy MADM)*. Yogyakarta: Graha Ilmu, 2013.

[4] S. Kusumadewi, S. Hartati, A. Harjoko, dan R. Wardoyo, *Fuzzy Multi-Attribute Decision Making (Fuzzy MADM)*. Yogyakarta: Graha Ilmu, 2006.

[5] S. M. Muhamad Muslihudin, Fauzi, Satria Abadi, Trisnawati, *Implementasi Konsep Decision Support System & Fuzzy Multiple Attribute Decision Making (Fmadm)*. Bandung: Penerbit Adab, 2021.

[6] A. D. Susanti, M. Muslihudin, dan S. Hartati, "Sistem Pendukung Keputusan Perankingan Calon Siswa Baru Jalur Undangan Menggunakan Simple Additive Weighting (Studi Kasus : SMK Bumi Nusantara Wonosobo)," *SEMNASTEKNOMEDIA*, vol.

5, no. 1, hal. 37–42, 2017.

[7] S. H. Hanifa, Muhamad Muslihudin, "Sistem Pendukung Keputusan Menentukan Besar Gaji Untuk Guru Honorer Di Kabupaten Pesawaran Menggunakan Metode Fuzzy SAW," *Jurtek IST Akprind Yogyakarta*, vol. 9, no. 2, hal. 83–88, 2016.

[8] L. Muhamad Muslihudin, "Implementasi Fuzzy Multiple Attribute Decision Making Menggunakan Metode Simple Additive Weighting Untuk Diagnosa Awal Gangguan Pada Masa Kehamilan," in *KNSI 2016*, 2016, hal. 11–13.

[9] M. Muslihudin, F. Triananingsih, dan L. Anggraei, "Pembuatan Model Penilaian Indeks Kinerja Dosen Menggunakan Metode Fuzzy Simple Additive Weighting," *SEMNASTEKNOMEDIA*, vol. 5, no. 1, hal. 25–30, 2017.

[10] R. Suhandi, L. Anggraeni, dan M. Muslihudin, "Cara Penentuan Kelayakan Calon Kepala Desa Pada Desa Blitarejo Mengunakan Metode Simple Additive Weighting (SAW)," in *KNSI 2016*, 2016, hal. 11–13.

[11] M. A. J. P. R. Ferry Susanto, "Implementasi Metode Weighted Product Penentuan Calon Penerima Bibit Pertanian," in *Prosiding Seminar Nasional Darmajaya*, 2021, hal. 1–10.

[12] R. Mawarni dan M. Parida, "Website Implementation for Making Scholarship Acceptance Decisions At SMK N 1 Talangpadang Using The Analytical Hieararchy Process Method," *Int. J. Inf. Syst. Comput. Sci.*, vol. 3, no. 3, hal. 113–122, 2019.

[13] H. Tri, D. Irawan, dan A. T. Hudayat, "Design of Information System Of Career Center Alumni Stmik Musirawas Lubuklinggau Mobile Web Base," *IJISCS*, vol. 3, no. 3, hal. 86–89, 2019.

[14] S. Mukodimah, M. Muslihudin, A. Andoyo, S. Hartati, dan A. Maseleno, "Fuzzy Simple Additive Weighting and its Application to Toddler Healthy Food," *Int. J. Pure Appl. Math.*, vol. 118, no. 7, hal. 1–7, 2018.

[15] F. Susanto, *Pengenalan Sistem Pendukung Keputusan*. Bandar Lampung: Deepublish, 2020.