IMPLEMENTATION OF THE SIMPLE ADDITIVE WEIGHTING METHOD FOR EMPLOYEE PERFORMANCE ASSESSMENT

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Abstrak

Proses penilaian kinerja karyawan, perusahaan telah menetapkan prosedur operasional standar. Dari sekian banyak standar, sulit bagi manajemen untuk memberikan bobot pada setiap standar. Oleh karena itu, diperlukan sistem pengambilan keputusan untuk meningkatkan kinerja dan produktivitas perusahaan. Sumber daya manusia harus mampu meningkatkan kinerja pegawai. Pengetahuan atau kemampuan profesional. Permasalahan penilaian saat ini, termasuk proses penilaian kinerja karyawan, masih menggunakan cara tradisional dan belum akurat. Penelitian dilakukan dengan menggunakan metode simple additive weighting (SAW). Hasil penelitian ini menunjukkan bahwa dengan menggunakan metode SAW, manajemen lebih cenderung memperhatikan evaluasi kinerja karyawan, serta lebih terorganisir dan efisien dalam mengevaluasi kinerja karyawan.

Kata Kunci: Metode Simple Additive Weighting, metode SAW, Penilaian Kinerja Karyawan, Sistem Penunjang Keputusan

Abstract

In the process of evaluating employee performance, the company has established standard operating procedures. Of the many standards, it is difficult for management to give weight to each standard. Therefore, a decision-making system is needed to improve company performance and productivity. Human resources must be able to improve employee performance. Professional knowledge or ability. The current appraisal problem, including the employee performance appraisal process, is still using the traditional and not yet accurate method. The research was conducted using the simple additive weighting (SAW) method. The results of this study indicate that by using the SAW method, management is more likely to pay attention to employee performance evaluation, and is more organized and efficient in evaluating employee performance.

Keywords: Simple Additive Weighting Method, SAW method, Employee Performance Assessment, Decision Support System

INTRODUCTION

A company carrying out business activities, definitely requires human resources (HR) who have qualified and competent expertise in their fields and must be in accordance with the company's main objectives. In this case, employees have their respective duties and responsibilities that have been assigned to them, but not all employees have good performance (Hidayati, Purwanto, & Yuwono, 2011). This is why companies need to evaluate the performance of their employees (Ayun, 2011), Because from the evaluation it can be seen whether the employee's performance is in accordance with the realization of company goals. Employee performance appraisal itself is a systematic study of employee working conditions that is carried out formally associated with work standards that have been determined by the company (Muhdar HM, 2012; Ponijan, 2012). From this assessment, it will be known whether the employee's work is adequate and in accordance with performance standards, and recommendations for improvement can be made in the future. The activity of assessing performance begins with identifying the organization's goals and then conducting a performance analysis to determine the organization's management's expectations of performance. At the end of the period, the assessment team carries out its assessment activities by measuring performance and evaluating, then comparing work findings with work targets, then discussing and communicating the results of the assessment, finally discussing performance improvement program planning. The

performance evaluation process, organizations can use a variety of different measures for planning, measuring, and evaluating organizations (Fatimah, 2017).

The company in conducting the employee performance appraisal process, the company has determined a lot of criteria, from many criteria it can be difficult for the management to give weight to each criterion, therefore a decision-making system is needed to improve performance productivity in a company, then human resources must have expertise or competence to improve employee performance.

Assessment problems that are currently being faced, including the employee performance appraisal process that still uses conventional methods is not yet accurate (Putra Riyanto & Saragih, 2019) in the assessment of work performance, and the absence of a special method to support the determination of the assessment of outstanding employees.

Mujiastuti in 2019 found that research conducted using the Simple Additive Weighting (SAW) method can be applied to regulate performance appraisals with the criteria of Attendance, attitude/ethics, time discipline, work quality, and work quantity. In the results of the performance appraisal trial, the predetermined criteria will produce a ranking number of employee performance appraisals. The calculation accuracy of the SAW method implemented in the Web-based employee performance appraisal decision support system application (Mujiastuti, Komariyah, & Hasbi, 2019). Agustini and Eriska in 2019 said that employee performance appraisal using the FSAW method if the weight of the criteria is large but the value is small, it will be very influential for the assessment but if there is a deficiency in one of the criteria with a small weight, then it is not too influential for the assessment of several aspects of the criteria using the FSAW model. running well and can produce clear and fast weighting of assessment criteria and information compared to manual calculations (Agustini & Ariska, 2019; Frieyadie, 2018).

Based on the description above, the SAW method can find the best alternative based on predetermined criteria (Setiadi, Yunita, & Ningsih, 2018). The SAW method is often known as the weighted addition method (Frieyadie, 2016). The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all attributes. The SAW method can help in deciding on a case, but the calculation using the SAW method is only the one that produces the largest value that will be selected as the best alternative.

The purpose of this research is to make it easier for the company to determine the quality and achievement of each employee through the performance assessment carried out.

RESEARCH METHODS

1. Research Instruments

An instrument is a tool used to do something. Instruments such as tools, which are used as research tools to collect data as processing materials. There are several instruments used in between.

a. Interview

This interview met with the Operations Manager CV. Creative Public Media. Researchers conducted unstructured interviews with those conducted directly (face to face). Where the researcher uses interview guidelines that are arranged systematically, this activity is intended to obtain information about the shortcomings and procedures for previous performance appraisals, so that researchers can determine the criteria and alternatives to be used.

b. Observation (Observation)

Observations made dating directly to CV. Creative Public Media collects data through direct observation.

c. Questionnaire

This is done by distributing a list of questionnaires to 30 employees to assess the respondents, namely, HRD Manager, IT Manager, Ops Manager, and Customer Care Manager at CV. Creative Public Media, the data taken includes the following aspects: 1) Quantity and Quality of Work, 2) Compliance with Compliance Principles, 3) Cooperation, 4) Work Spirit, 5) Work Discipline.

The above aspects are assessed using five measurement categories: Category 1 states Very Low (VL); Category 2 states Low (L); Category 3 states Enough (E); Category 4 states Height (H), Category 5 states Very High (VH).

2. Research Variables

This study uses a questionnaire instrument made using closed questions (Lubis, 2014). Each respondent can quickly and easily answer the questionnaire so that data from the questionnaire can be quickly analyzed systematically, and the same statement can be repeated easily. The questionnaire was made with a Likert scale. The scale used in the questionnaire uses a Likert scale with a positive value scale between Very Low (VL), Low (L), Enough (E, High (E), and Very High (VH).

Table 1 follows the indicators of the research variables used as questionnaire questions:

Tabel 1 Kisi-Kisi Instrumen Penelitian

Variabel	Pertanyaan
Quantity and Quality of Work	1. Produce and achieve quantity of work in accordance with company targets
	2. Can do the job carefully, precisely and according to the purpose
Obey the Principle of Compliance	3. Doing a job in accordance with the Standard Operational Procedure specified in a job
	4. Carry out work with full responsibility
Cooperate	5. Able to coordinate and communicate well with leaders, colleagues and staff who are their responsibility
	6. Can work in a team
Spirit at work	7. Completing well a job that is the responsibility given
	8. Complete work with better results
Work Discipline	9. Carry out work based on the structure of company provisions
	10. Adapting work quickly and precisely to every new decision taken by the company

3. Analysis Method

The method used for analysis is the SAW method, often also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all attributes (Mahendra & Aryanto, 2019). The SAW method requires the process of normalizing the decision matrix (X) to a scale that can be compared with all available alternative ratings (Wolo, Servasius, Paseng, & Roberth, 2019).

The research steps in the SAW method are 1) determine the criteria that will be used as a reference in decision making, namely Ci. 2) Determine the suitability rating of each alternative on each criterion. 3) Make a decision matrix based on the criteria (Ci), then normalize the matrix based on the equation that is adjusted to the type of attribute (profit attribute or cost attribute) in order to obtain a normalized matrix R. 4) Determination of normalization of the matrix based on a scale that can be compared with all alternative ratings available is in the matrix. The SAW equation is like equation 1 below.

$$r_{ij} = \begin{cases} \dfrac{X_{ij}}{Max\ X_{ij}} & Jika\ j\ adalah\ atribut\ keuntungan\ (Benefit) \\ \dfrac{Min\ X_{ij}}{X_{ij}} & Jika\ j\ adalah\ atribut\ biaya\ (Cost) \end{cases}$$

....(1)

Explanation:
r_{ij} = Normalized performance rating value
X_i= The attribute value of each criterion
Benefit= If the biggest value is the best
Cost= If the smallest value is the best where is the normalized performance rating of the alternative Ai on the attribute Cj; i=1,2,....,n.

The final result is obtained from each ranking process, namely the addition of the normalized matrix multiplication R with the weight vector so that the largest value is chosen as the best alternative (Ai) as the solution.

In this process, it becomes the product of the preference weights (W) with each column of the normalized matrix in one row according to the alternative solution of the choice given. Data was collected by giving questionnaires to 4 managers consisting of HR Manager, IT Manager, Operations Manager, and Finance Manager. The following questions were asked in the pre-test, after the application of the SAW method:

- Make it easier to evaluate employee performance?
- Provide precise and accurate analysis of employee performance appraisals?
- Provide benefits for the company?
- Using multiple parameters/variables?
- Provide accurate information?
- Assist the company in decision making?
- Provide information quickly?

The questionnaire process was measured using a Likert scale, which is a form of a rating scale of 1 to 5 with the following descriptions: Number 1 indicates Disagree (TS); Number 2 indicates Disagree (KS) Number 3 indicates Doubtful (R) Number 4 indicates Agree (S); Number 5 states Strongly Agree (SS)

4. Pretest

Table 2 is a pre-test calculation which has the initial steps taken before calculating the weight of each employee. After the data is obtained, the next step is to perform calculations with the data using the SAW method

Table 2. Pre-Test

No	Name	Position	Question							Total
			1	2	3	4	5	6	7	
1	Nur Hardi	Human Resources Manager	2	4	2	3	3	4	3	21
2	Tubagus Mardianto	Information Technology Manager	2	4	3	2	2	2	4	19
3	Dewi Anggraini	Financial Manager	3	3	2	3	4	3	4	22
4	M. Yudhana S.	Operational Manager	3	2	4	2	3	4	4	22

RESULTS AND DISCUSSION

Problem analysis

In this study, there are five criteria, namely 1) Quantity and Quality of Work, 2) Compliance with the Principles of Compliance, 3) Cooperation, 4) Morale, 5) Work Discipline. Each variable has an indicator. The number of indicators used is 10 questions, each variable has 2 questions.

Data processing

After the data is obtained, the next step is to perform calculations with the data using the SAW method. To analyze the data from the questionnaire, the following steps are carried out:

a. Quantity and Quality of Work
P1 = Produce and achieve the quantity of work in accordance with the company's target
P2 = Able to do work carefully, precisely and according to purpose

b. Obey the Principle of Compliance
P3 = Doing a job in accordance with the Standard Operational Procedure specified in a job
P4 = Carry out work with full responsibility

c. Cooperate
P5 = Able to coordinate and communicate well with leaders, colleagues and staff who are their responsibility
P6 = Able to work in a team.

d. Spirit at work
P7 = Complete a job that is the responsibility given
P8 = Complete work with better results

e. Work Discipline
P9 = Carry out work based on the structure of company provisions
P10 = Adapting work quickly and precisely to every new decision taken by the company

From the predetermined weight fuzzy numbers can be converted to crisp numbers:
Very High (ST) = 1; Height (T) = 0.75; Enough (C) = 0.5; Low (R) = 0.25; Very Low (SR) = 0

Ranking.

After the normalization process, the preference value for each alternative (Vi) is calculated with the average value of each leader, as shown in table 3 below..

Table 3 Ranking of the Combined Questionnaire

No	Alternative	HR Manager	IT Manager	Financial Manager	Operational Manager	Total	Rank
1	Gunawan	3,5	3,75	3,5	4,08	14,83	1
2	Wanti	3,33	3,83	3,42	4	14,58	2
3	Hendrawan	3,08	3,58	3,5	4,33	14,49	3
4	Fauzi	3,29	3,5	3,63	3,83	14,25	4
5	Handayani	3,42	3	3,92	3,75	14,09	5
6	Siswandi	3,5	3,75	2,75	3,92	13,92	6
7	Nurlaela	3,58	3,67	3,25	3,42	13,92	7
8	Setiorini	3,42	2,92	3,67	3,75	13,76	8
9	Handayani	3,13	3,58	3,42	3,58	13,71	9
10	Antono	3,17	3,58	3,17	3,67	13,59	10
11	Junaedi	3,13	3,08	3,33	3,83	13,37	11
12	Novianti	3,5	3,33	3,25	3,25	13,33	12
13	Setiawan	3,75	3,42	2,83	3,25	13,25	13
14	Budiono	3,63	3,33	3,42	2,83	13,21	14
15	Ruswanto	3,58	2,75	3,08	3,75	13,16	15
16	Rifai	3,38	3	4,25	2,5	13,13	16

No	Alternative	HR Manager	IT Manager	Financial Manager	Operational Manager	Total	Rank
17	Wandi	3,29	3,08	3,17	3,58	13,12	17
18	Retno	3,63	2,83	3,17	3,38	13,01	18
19	Fatmawati	3,17	3,5	3,5	2,75	12,92	19
20	Soebagyo	3,63	2,83	3,33	3,08	12,87	20
21	Sintawati	2,21	3,17	3,75	3,58	12,71	21
22	Ernawati	2,75	2,67	4,58	2,67	12,67	22
23	Mardianto	3,5	2,83	2,92	3,25	12,5	23
24	Davina	3,13	3,08	2,58	3,67	12,46	24
25	Ninawati	3,38	3	3,75	2,25	12,38	25
26	Asep	3,21	3	3,58	2,58	12,37	26
27	Nurazizah	2,88	2,92	3,75	2,58	12,13	27
28	Indah	2,88	2,92	3,75	2,25	11,8	28
29	Dina	3,17	2,17	3,25	3,08	11,67	29
30	Riantina	3,08	3,08	3,42	1,83	11,41	30

Results

After the employee performance appraisal is implemented in CV. Creative Public Media, distributed questionnaires to the same 30 respondents to measure the impact of system implementation with questions and results of employee performance appraisals using the SAW method, can be seen as follows:
- Provide more accurate information?
- Provide more accurate information?
- More effective for assessing employee performance?
- Assist the company in decision making?
- Is it easy to use in evaluating employee performance?
- Provide more precise and accurate analysis?
- Can it be used to assess employee performance using several parameters?
- Can it provide benefits to the company?

Hasil Post Test

Table 4 Post Test

No	Name	Position	1	2	3	4	5	6	7	Total
1	Nur Hardi	Human Resources Manager	3	5	3	4	4	5	4	28
2	Tubagus Mardianto	Information Technology Manager	3	5	4	3	3	3	5	26
3	Dewi Anggraini	Financial manager	4	4	3	4	5	4	5	29
4	M. Yudhana S.	Operational Manager	4	3	5	3	4	5	5	29

The results of the pre-test and post-test can be summarized in table 5: The results of the pre-test and post-test that have been calculated from the questionnaire given.

.Table 5. Comparison of Pre Test and Post Test Results

No	Employee Name	Position	Pre Test	Post Test
1	Nur Hardi	Human Resources Manager	21	28
2	Tubagus Mardianto	Information Technology Manager	19	26
3	Dewi Anggraini	Financial manager	22	29
4	M. Yudhana S.	Operational Manager	22	29

Prior to the existence of a decision support system, employee performance appraisal was done manually. After the scores are recapitulated, then the calculation is carried out by adding up the values of each criterion, so that the total value of each employee is obtained. The examples of employee assessments that are carried out manually in table 6 are as follows::

Table 6 Results of Manual Employee Assessment

No	Alterntiv	Human Resources Manager	Information Technology Manager	Financial manager	Operational Manager	Total	Rank
1.	Nurlaela	26	29	26	54	135	1
2.	Junaedi	32	32	30	39	133	2
3.	Davina	33	32	33	32	130	3
4.	Dina	30	32	35	32	129	4
5.	Gunawan	31	32	32	33	128	5
6.	Handayani	30	33	32	31	126	6
7.	Ernawati	33	27	30	36	126	7
8.	Ruswanto	32	31	30	31	124	8
9.	Setiorini	32	31	30	31	124	9
10.	Handayani	30	31	31	31	123	10
11.	Mardianto	30	30	30	32	122	11
12.	Budiono	30	29	32	30	121	12
13.	Riantina	30	28	32	30	120	13
14.	Siswandi	28	29	32	30	119	14
15.	Soebagyo	30	29	30	29	118	15
16.	Antono	26	31	32	28	117	16
17.	Retno	30	28	26	32	116	17
18.	Sintawati	28	28	30	29	115	18
19.	Setiawan	29	28	28	29	114	19
20.	Wanti	29	27	29	28	113	20
21.	Novianti	29	28	28	27	112	21
22.	Asep	31	27	28	25	111	22
23.	Ninawati	26	29	28	27	110	23
24.	Hendrawan	28	28	27	26	109	24
25.	Rifai	23	25	30	30	108	25
26.	Fauzi	30	26	25	24	105	26
27.	Fatmawati	26	25	28	25	104	27
28.	Nurazizah	22	28	27	26	103	28
29.	Indah	23	25	27	27	102	29
30.	Wandi	24	26	26	25	101	30

From the results of calculations manually and by using a decision support system, there are differences in the results of the ranking carried out. This is because in the manual calculation the total value is obtained by adding up all the values for each criterion, while in the calculation using the SAW method, first weighting is carried out for each criterion, then the value of each criterion is carried out. The difference in ranking can be seen in table 7 below:

Table 7. Differences in Manual Ranking with SAW Perhitungan Calculations

No	Employee Name	Manual Calculation Rank	SAW Calculation Rank
1	Nurlaela	1	7
2	Junaedi	2	11
3	Davina	3	24
4	Dina	4	29
5	Gunawan	5	1
6	Handayani	6	5
7	Ernawati	7	22
8	Ruswanto	8	15
9	Setiorini	9	8
10	Handi	10	9
11	Mardianto	11	23
12	Budiono	12	14
13	Riantina	13	30
14	Siswandi	14	6
15	Soebagyo	15	20
16	Antono	16	10
17	Retno	17	18
18	Sintawati	18	21
19	Setiawan	19	13
20	Wanti	20	2
21	Novianti	21	12
22	Asep	22	26
23	Ninawati	23	25

No	Employee Name	Manual Calculation Rank	SAW Calculation Rank
24	Hendrawan	24	3
25	Rifai	25	16
26	Fauzi	26	4
27	Fatmawati	27	19
28	Nurazizah	28	27
29	Indah	29	28
30	Wandi	30	17

If table 7 the difference in ranking with manual calculations and ranking with Simple Additive Weighting calculations, it is described in graphical form, Figure 1 will appear as follows:
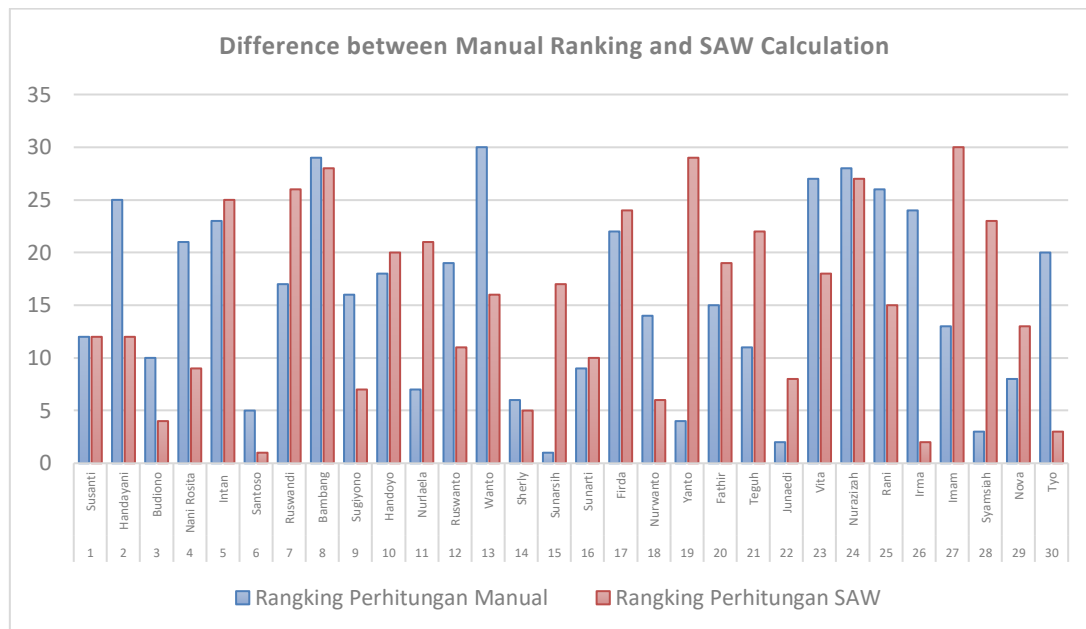

Figure 1 Comparison Graph of Manual Ranking against SAW

CONCLUSION

Using the SAW method has been felt by the management, which has an impact on making it easier to give an assessment weight to the performance of its employees as well as being more organized and efficient in conducting assessments. This SAW method has been tested for its validity level so that it gets the results of Mr. Gunawan as the best employee

REFERENCE

Agustini, F., & Ariska, E. R. (2019). Penerapan Metode Simple Additive Weighting (Saw) Dengan Model Fuzzy Model Attribute Decision Making (Fmadm) Penilaian Kinerja Karyawan Dtpeduli. *Jurnal Techno Nusa Mandiri*, *16*(1), 21–28. https://doi.org/10.33480/techno.v16i1.107

Ayun, Q. (2011). Penilaian Kinerja (Performance Appraisal) pada Karyawan di Perusahaan.

Majalah Ilmiah INFORMATIKA, *2*(3), 74–88. Retrieved from https://www.unaki.ac.id/ejournal/index.php/majalah-ilmiah-informatika/article/view/48

Fatimah, F. N. D. (2017). *Panduan Praktis Evaluasi Kinerja Karyawan*. Depok: Anak Hebat Indonesia.

Frieyadie, F. (2016). Penerapan Metode Simple Additive Weight (SAW) Dalam Sistem Pendukung Keputusan Promosi Kenaikan Jabatan. *Pilar Nusa Mandiri: Journal of Computing and Information System*, *12*(1), 37–45. https://doi.org/10.33480/PILAR.V12I1.257

Frieyadie, F. (2018). Metode AHP Sebagai Penunjang Keputusan Untuk Penilaian Kinerja Kerja Karyawan SPBU. *Jurnal Techno Nusa Mandiri*, *15*(1), 63–68. https://doi.org/10.33480/techno.v15i1.60

Hidayati, R., Purwanto, Y., & Yuwono, S. (2011). Kecerdasan Emosi, Stres Kerja Dan Kinerja

Karyawan. *Jurnal Psikologi*, *2*(1), 91–96. Retrieved from https://ejournal.gunadarma.ac.id/index.php/psiko/article/view/249

Mahendra, G. S., & Aryanto, K. Y. E. (2019). SPK Penentuan Lokasi ATM Menggunakan Metode AHP dan SAW. *Jurnal Nasional Teknologi Dan Sistem Informasi*, *5*(1), 49–56. https://doi.org/10.25077/TEKNOSI.V5I1.2019.49-56

Muhdar HM. (2012). Stres Kerja Dan Kinerja Dalam Perspektif Teori Dan Bukti Empirik. *Journal of Innovation in Business and Economics*, *3*(2), 111–120. https://doi.org/10.22219/JIBE.V3I2.2234

Mujiastuti, R., Komariyah, N., & Hasbi, M. (2019). Sistem Penilaian Kinerja Karyawan Menggunakan Metode Simple Additive Weighting (SAW). *JUST IT : Jurnal Sistem Informasi, Teknologi Informasi Dan Komputer*, *9*(2), 133–141. https://doi.org/10.24853/JUSTIT.9.2.133-141

Ponijan, P. (2012). Penilaian Kinerja Dan Komitmen Dalam Etika Pemerintahan. *Majalah Ilmiah Widya*, *29*, 34–40. Retrieved from https://e-journal.jurwidyakop3.com/index.php/majalah-ilmiah/article/view/71

Putra Riyanto, N., & Saragih, T. S. (2019). Reminder System dan Monitoring Proyek untuk Penilaian Kinerja Karyawan Berbasis Web. *Jurnal Sisfokom (Sistem Informasi Dan Komputer)*, *8*(2), 172–183. https://doi.org/10.32736/SISFOKOM.V8I2.634

Setiadi, A., Yunita, Y., & Ningsih, A. R. (2018). Penerapan Metode Simple Additive Weighting(SAW) Untuk Pemilihan Siswa Terbaik. *Jurnal Sisfokom (Sistem Informasi Dan Komputer)*, *7*(2), 104. https://doi.org/10.32736/sisfokom.v7i2.572

Wolo, P., Servasius, A., Paseng, M., & Roberth, Y. W. (2019). Sistem Pendukung Keputusan Penentuan Penerimaan Raskin Menggunakan Metode Simple Additive Weighting (Studi Kasus Kelurahan Kota Uneng). *Teknika*, *8*(1), 74–77. https://doi.org/10.34148/TEKNIKA.V8I1.151