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Comparative Analysis of SAW and TOPSIS on Best Employee Decision Support System

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Abstract: The decision-making process has many assessment criteria needed as the basis for its assessment. A large number of problems regarding the length of time required in the decision-making process require decision-makers to find solutions. Decision Support System is one option that can be developed by decision makers because it can help improve efficiency and accuracy in the decision-making process. The process of developing decision support requires certain calculation methods as part of the processing. The methods that are quite widely used to build a decision support system include the Simple Additive Weighting (SAW) method and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. This research aims to analyze the accuracy of the cases raised as solutions to decision-making problems. A dynamic decision support system has been successfully created to design dynamics in the calculation of the SAW method and the TOPSIS method. The system is evaluated and analyzed for its accuracy level based on manual calculations. The results obtained are the SAW system has an accuracy value of 65% and the TOPSIS system is 100%. Furthermore, the calculation of the accuracy value of the SAW and TOPSIS methods in order to find out the best method to use by taking parameters in the form of the same value results generated from the calculations of the two methods. The results obtained are the accuracy value of the SAW method of 40% and the TOPSIS method of 100% based on testing using 60 employee data and 8 criteria used. The implementation of this research is that TOPSIS method already fully installed on the targeted office replacing the old way of decision making.

Keywords: DSS; employee; SAW; system; TOPSIS;

INTRODUCTION

The methods used to build DSS are very diverse, including Simple Additive Weighting (SAW), Weighted Product (WP), Analytic Hierarchy Process (AHP), technique for Order Preference by Similarity to Ideal Solution (TOPSIS), ELECTRE and PROMETHEE. SAW and TOPSIS methods are settlement methods in decision support systems that are quite widely used from several existing methods. The SAW and TOPSIS methods are included in the FMADM (Fuzzy Multiple Attribute Decision Making) model, chosen because this model determines the weight value for each attribute, then proceeds with a ranking process that will select the best alternative from a number of alternatives, in this case the alternative in question is the employee who deserves the title of the best employee (Abdillah & Agustin, 2015).

Abdillah et.al, on their previous research stated that A Decision Support System is needed so that the selection process for outstanding homeroom teachers can be more structured, precise and easy to do and facilitate the use of data that has been stored in the database. The Decision Support System that was built applies the TOPSIS method by determining the weight of the importance of each attribute of the assessment so that it can accurately present the results of the assessment to determine the homeroom achievers (Abdillah & Agustin, 2015.

Adikusuma and Erawan on their research said that determining the productivity of a bank's Account Officer is an important thing to do. A person's decision in determining the level of productivity greatly determines the incentives of the AO. Therefore, a decision support system is needed to assist the process of determining the productivity of the Account Officer. This system uses the SAW (Simple Additive Weighting) method where this

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method adds up the weighted values of each criterion for each alternative. In the case study at PT BANK RAKYAT INDONESIA (Persero), Tbk Semarang Patimura Branch Office, the assessment of an AO consists of 3 main criteria, namely finance, internal business processes and customers, where each main criterion still has sub criteria. To determine the level of productivity of AO, the weights of the results of AO's performance are added. The highest value indicates that the AO has the highest rank. Previously at PT Bank Rakyat Indonesia (Persero), Tbk Semarang Patimura Branch Office still uses Excel for ranking and takes a long time to process. calculation. After being tested this decision support system can perform the ranking process according to the criteria and save the time needed in the ranking process. Thus this system is able to overcome problems in the process of determining AO productivity at PT Bank Rakyat Indonesia (Persero), Tbk Semarang Patimura branch office so that relevant parties get timely results in issuing ranking results (Adikusuma & Erawan, 2015).

These previous research used one of the method that observed on this research. The differences between the previous research is that this research combined and analyze two methods and determine which method that give best results, while the previous only use one method and implementing them on their institution.

These methods are needed in a decision support system because manual decision making takes longer than using a computerized system. The more criteria and parameters used, the longer it takes, and the more difficult it is to determine gaps in the ranking process.

METHOD

The object of research used in this research is the case of the Best Employee Decision Support System. Sampling of data for this research was conducted at Rumah Mode Citra Ayu Yogyakarta which requires a system to assess the performance of its employees. The sample data used is 60 data which will then be analyzed using the SAW and TOPSIS methods.

This research requires complete data and information to support the testing phase to be carried out. The object of this research is the SAW and TOPSIS methods with sampling carried out at Citra Ayu Fashion House, a company engaged in the fashion industry, located in Yogyakarta. The data collection methods used are as follows:

1. Observation. Is a data collection method in which researchers will make direct observations in the research field. In this study, researchers made direct observations at Citra Ayu Fashion House to collect testing needs.
2. Interview. The researcher conducted direct interviews with the informants (owners) of Rumah Mode Citra Ayu Yogyakarta regarding the needs that would be used for testing.

The SAW and TOPSIS methods require criteria for their calculations. These criteria then become the basis for determining the alternative weights to make a decision matrix. The criteria used as the basis for determining the alternative weights are as follows:

1. C1: Presence
   Attendance is employee attendance data, where the data contains data regarding arrival time, return time, and employee attendance status.
2. C2: Discipline
   Discipline is an assessment of attitudes during work, where the assessment is about attitudes towards work responsibilities and time.
3. C3: WORK TARGET
   Work target is the achievement of the fulfillment of production targets that can be carried out by employees.
4. C4: LEAVE
   Leave is the right to take a day off/leave work for certain reasons without reducing the attendance value. The leave parameter used based on data collection carried out is annual leave.
5. C5: WORKING PERIOD
   The term of service is the length of work/length of time an employee works for a company/institution which is calculated from the time the work agreement is signed and started.
6. C6: PERMISSION
   Permit is an activity to leave the office temporarily during working hours with the knowledge of HRD.
7. C7: COMMUNICATION
   Communication is a person's ability to convey something in the form of opinions, work achievements and input to teammates or companies.
8. C8: COOPERATION
   Cooperation is a person's ability to do a job with colleagues in one division.

The data collection process carried out at the research location obtained results in the form of employee data and criteria used as an employee assessment tool, where this data will be implemented in the calculation of SAW

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and TOPSIS. The weighting of each criterion will be carried out before the process of implementing the employee data. This weighting is done to determine the size of the assessment of a criterion. This calculation using SAW and TOPSIS uses 60 samples of employee data and 8 assessment criteria using Ms. Excel to simplify manual calculations and CI framework to implement calculations using the system.

The data obtained came from the personnel department at Citra Ayu Fashion House by looking at the data of all employees. Employee data obtained in the form of employee biographies and employee supporting data such as attendance and work targets of employees. The data obtained is used as the basis for making supporting criteria for selecting the best employees. The next process is to determine the weight of each criterion and from each criterion a suitability rating will be made and then a normalized decision matrix is made so that the value with the largest weight is obtained.

RESULT

The SAW and TOPSIS systems were created with the aim of helping the processing of large amounts of data, for example, processing employee data of 500 people with varying assessment criteria. This of course will take a long time if done manually. MS-Excel assistance in manual calculations will also not provide maximum results if the data to be processed amounts to hundreds or thousands because MS-Excel in its calculations must enter formulas manually and repeatedly. This problem can be solved by building a system that is able to implement the SAW and TOPSIS methods automatically. The results of the implementation and testing of the system can be described as follows:

1. Login Page

The login page displays the login form on the SAW and TOPSIS systems. The login page is created for the user according to the access rights that have been granted. Users can access the main page if they enter "username" and "password" correctly.

2. Main page

Users will be directed to the main page after successfully logging in. The main page contains activity menus that can be selected by the user to perform SAW calculations.

3. Criteria Data Page

The criteria data page is used for assessment criteria management. Users can add new criteria, reduce existing criteria, and make edits to criteria on this page. The criteria data in the SAW and TOPSIS systems have been made dynamic, allowing users to enter criteria without restrictions.

4. CRITERIA WEIGHTS PAGE

The criteria weight page shows the weighting for each of the existing criteria. The weight of the criteria will adjust according to the number of existing criteria. Users can edit the criteria weight page if there is a change in the weight of certain criteria.

5. ALTERNATIVE DATA PAGE

The alternative data page functions for alternative data management which in this case is employee data. Users can add employee data without a limit on the number as well as on the criteria page, on this page users can also edit existing employee data.

6. VALUE DATA PAGE

The value data page serves to enter the value of each alternative according to predetermined criteria.

Alternative Selection Page

The essence of the system created is on the alternative selection page where on this page all the data that has been entered will be processed by a calculation process using the SAW and TOPSIS methods.

DISCUSSIONS

The discussions about comparisons between two Decision Support System methods are rarely conducted. One of the researcher that conducted this field is Ananda DR, that compared AHP and SAW mettod. Many types and brands of bikes in market causes problem to choose a bike that fits in what we need. This Decision Support System was made to help people selecting a bicycle according to criteria that we wanted. This system implementing Analytical Hierarchy Process (AHP) and Weigthed Sum Model (WSM) method, AHP is a method that can easily simplified complex problem and make decision Support System process become faster, AHP method change qualitative value to quantitative value and make an objective decision, WSM is the simplest and best method in decision making. Criteria that used in this research are models, brand and price of the bicycle, the result of the system is a recommendation value that appropriate to criteria weight that user wanted.

To broaden the knowledge for DSS method comparison, this research try to compare two DSS methods, i.e SAW and TOPSIS, the results can be described as follows.

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SAW Calculation

The suitability rating of each alternative on each criterion will be made after determining the criteria, the weight of the criteria preference and the weight of the criterion value that will be used to perform the calculations. This calculation uses 60 alternative data, as a sample calculation taken 10 data for the suitability rating.

Table 1. Suitability Rankings

No	Alternatives	C1	C2	C3	C4	C5	C6	C7	C8
1	A1	5	4	4	3	3	4	2	3
2	A2	3	3	4	4	4	5	4	3
3	A3	4	4	3	4	2	3	3	3
4	A4	2	3	3	3	5	4	5	4
5	A5	2	5	3	4	3	4	3	4
6	A6	4	4	4	4	3	3	2	5
7	A7	3	4	4	5	3	4	4	4
8	A8	5	4	5	4	4	3	3	3
9	A9	3	5	4	4	5	4	3	5
10	A10	2	3	3	3	4	4	4	4

The process will continue on making a decision matrix based on criteria after making a suitability rating. The author uses MS-Excel in manual calculations to help carry out calculations, namely by implementing the SAW method formula using the MS-Excel formula, as for the matrix and the results of calculations using the system are shown in the following figure:

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

Fig. 1 SAW Excel based Calculation

Nilai Awal

No.	Kode	Alternatif [Pegawai]	Nilai Kriteria							
			Cuti	Disiplin	Ijin	Kerjasama	Komunikasi	Masa Kerja	Presensi	Target Kerja
1	A1	Rusdi Alansyah	3	4	4	3	2	3	5	4
2	A2	Lukman Rifqy	4	3	5	3	4	4	3	4
3	A3	Fitrah Yusup	4	4	3	3	3	2	4	3
4	A4	Daniel Aufa	3	3	4	4	5	5	2	3
5	A5	Agus Budi S	4	5	4	4	3	3	2	3
6	A6	Intan Martania P	4	4	3	5	2	3	4	4
7	A7	Arie Firmansyah	5	4	4	4	4	3	3	4
8	A8	Joseph Sulistyo	3	4	3	3	3	4	5	5
9	A9	Sumarsih	3	5	4	5	3	5	3	4
10	A10	Sumarwan	3	3	4	4	4	4	2	3

Fig. 2 SAW System based Calculation

The normalization results that have been obtained are then entered into equation by multiplying the normalized matrix by the criteria weights, so as to get the ranking results as shown in the table for the ordered

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ranking results from the alternatives that have the largest to the smallest preference values from manual calculations and rankings from the system.

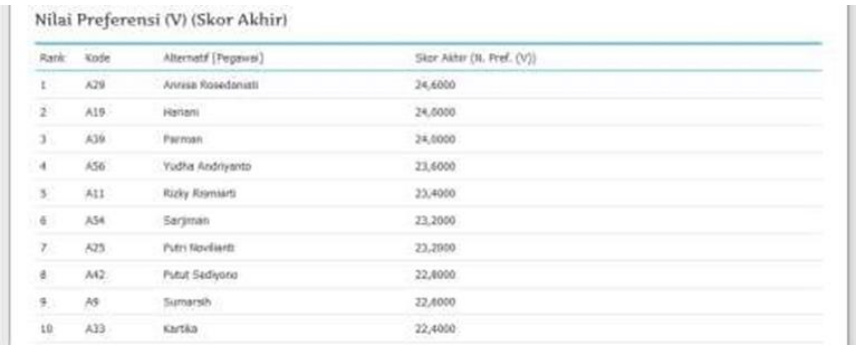
Table 2. Alternative Rangkings (SAW)

Alternatif	Nilai
A29	24,6000
A19	24,0000
A39	24,0000
A56	23,6000
A11	23,4000
A9	23,4000
A25	23,2000
A54	23,2000
A42	22,8000
A33	22,4000

Table 2 describes the alternative rankings on SAW method before being sorted. In can be shown based on Table 2 that the result is likely random. The random result can be difficult to read by other readers so it needs to be sorted as shown on Table 3.

Table 3. Sorted Alternative Rankings (SAW)

Alternatif	Nilai
A1	19,2000
A2	21,0000
A3	18,4000
A4	20,4000
A5	20,4000
A6	20,2000
A7	22,2000
A8	21,6000
A9	23,4000
A10	19,0000


Nilai Preferensi (V) (Skor Akhir)

Rank	Kode	Alternatif (Pegawai)	Skor Akhir (N. Pref. (V))
1	A29	Annisa Rosedanasti	24,6000
2	A19	Heriani	24,0000
3	A39	Parman	24,0000
4	A56	Yudha Andriyanto	23,6000
5	A11	Rizky Riamarti	23,4000
6	A54	Sarjiman	23,2000
7	A25	Putri Novilanti	23,2000
8	A42	Putut Sadiyono	22,8000
9	A9	Sumarsih	22,8000
10	A33	Kartika	22,4000

Fig. 3 SAW System based Rankings Results

The ranking results obtained between the system and manual calculations using MS-Excel get the same results, this shows that the calculations carried out in the system are running well and in line with expectations.

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TOPSIS Calculation

The TOPSIS calculation basically has the same initial steps as in the SAW calculation, which is using a match rating. The next step is to make a normalized decision matrix (R) by normalizing the employee values from the decision matrix (xij) starting from doing pairwise comparisons on each criterion xj (x1 to x4) resulting from xij which is the i-th alternative performance rating. against the jth criterion, this value is then normalized into a scale that can be compared from each alternative on each criterion (rij). The results obtained from the normalization process can be seen below for manual calculations and for system-based calculations.

$$R = \begin{vmatrix} 0{,}1699 & 0{,}1322 & 0{,}1288 & 0{,}1017 & 0{,}1012 & 0{,}1403 & 0{,}0725 & 0{,}1022 \\ 0{,}1019 & 0{,}0992 & 0{,}1288 & 0{,}1355 & 0{,}1350 & 0{,}1754 & 0{,}1451 & 0{,}1022 \\ 0{,}1359 & 0{,}1322 & 0{,}0966 & 0{,}1355 & 0{,}0675 & 0{,}1052 & 0{,}1088 & 0{,}1022 \\ 0{,}0680 & 0{,}0992 & 0{,}0966 & 0{,}1017 & 0{,}1687 & 0{,}1403 & 0{,}1814 & 0{,}1362 \\ 0{,}0680 & 0{,}1653 & 0{,}0966 & 0{,}1355 & 0{,}1012 & 0{,}1403 & 0{,}1088 & 0{,}1362 \\ 0{,}1359 & 0{,}1322 & 0{,}1288 & 0{,}1355 & 0{,}1012 & 0{,}1052 & 0{,}0725 & 0{,}1703 \\ 0{,}1019 & 0{,}1322 & 0{,}1288 & 0{,}1694 & 0{,}1012 & 0{,}1403 & 0{,}1451 & 0{,}1362 \\ 0{,}1699 & 0{,}1322 & 0{,}1610 & 0{,}1355 & 0{,}1350 & 0{,}1052 & 0{,}1088 & 0{,}1022 \\ 0{,}1019 & 0{,}1653 & 0{,}1288 & 0{,}1355 & 0{,}1687 & 0{,}1403 & 0{,}1088 & 0{,}1703 \\ 0{,}0680 & 0{,}0992 & 0{,}0966 & 0{,}1017 & 0{,}1350 & 0{,}1403 & 0{,}1451 & 0{,}1362 \end{vmatrix}$$

Fig. 4 TOPSIS Excel based Normalized Matrics

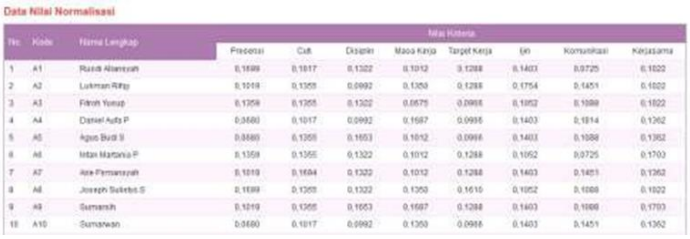

Fig. 5 TOPSIS System based Normalized Matrics

The next step is to determine the weighted normalized matrix (Y). The process of finding the weighted normalized value is by multiplying the value of the weighted matrix with the weight of the criteria that have been determined before. The results obtained from these calculations can be seen in the manual calculation so as to get the Y matrix and the next calculations on the system.

$$Y = \begin{vmatrix} 0{,}3398 & 0{,}6612 & 0{,}5151 & 0{,}4066 & 0{,}3037 & 0{,}4209 & 0{,}2902 & 0{,}3065 \\ 0{,}2039 & 0{,}4959 & 0{,}5151 & 0{,}5421 & 0{,}4050 & 0{,}5261 & 0{,}5804 & 0{,}3065 \\ 0{,}2719 & 0{,}6612 & 0{,}3863 & 0{,}5421 & 0{,}2025 & 0{,}3156 & 0{,}4353 & 0{,}3065 \\ 0{,}1359 & 0{,}4959 & 0{,}3863 & 0{,}4066 & 0{,}5062 & 0{,}4209 & 0{,}7255 & 0{,}4087 \\ 0{,}1359 & 0{,}8265 & 0{,}3863 & 0{,}5421 & 0{,}3037 & 0{,}4209 & 0{,}4353 & 0{,}4087 \\ 0{,}2719 & 0{,}6612 & 0{,}5151 & 0{,}5421 & 0{,}3037 & 0{,}3156 & 0{,}2902 & 0{,}5109 \\ 0{,}2039 & 0{,}6612 & 0{,}5151 & 0{,}6777 & 0{,}3037 & 0{,}4209 & 0{,}5804 & 0{,}4087 \\ 0{,}3398 & 0{,}6612 & 0{,}6438 & 0{,}5421 & 0{,}4050 & 0{,}3156 & 0{,}4353 & 0{,}3065 \\ 0{,}2039 & 0{,}8265 & 0{,}5151 & 0{,}5421 & 0{,}5062 & 0{,}4209 & 0{,}4353 & 0{,}5109 \\ 0{,}1359 & 0{,}4959 & 0{,}3863 & 0{,}4066 & 0{,}4050 & 0{,}4209 & 0{,}5804 & 0{,}4087 \end{vmatrix}$$

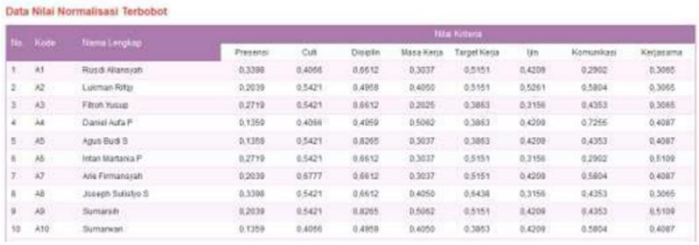

Fig. 7 TOPSIS System based Weighted Normalized Matrics

The next process, after obtaining the weighted normalized value, will find a matrix of positive ideal solutions and negative ideal solutions. The results of manual calculations are carried out using MS-Excel while only the results of calculations are using the system. The other TOPSIS process is to find the distance between the values of each alternative based on the results of the calculation of the ideal solution that has been obtained using equations (2.7) and (2.8). the picture shows the results of manual calculations and the results of system calculations, in the author's manuscript only 10 samples of the result data are listed.

The last step of the TOPSIS calculation is to determine the preference value for each alternative. After obtaining the distance between alternatives in the previous stage, then the preference value of each alternative

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will be sought. The results of the calculation of preference values will be shown in a table for ranking results based on manual calculations and for ranking results based on ordered manual calculations and for ranking results based on the system.

Table 3. Excel based Alternative Rankings (TOPSIS)

Alternatif	Nilai
A1	0,3860
A2	0,5379
A3	0,3872
A4	0,5160
A5	0,4981
A6	0,4328
A7	0,6120
A8	0,5275
A9	0,6222
A10	0,4318

Table 4. Excel based Sorted Alternative Rankings (TOPSIS)

Alternatif	Nilai
A29	0,7313
A19	0,7055
A39	0,6959
A56	0,6796
A54	0,6578
A11	0,6426
A25	0,6391
A42	0,6253
A9	0,6222
A44	0,6133

The ranking results obtained between the system and manual calculations using MS-Excel get the same results, this shows that the calculations carried out in the system are running well and in line with expectations.

Analysis of Systems's Accuracy

The ranking results that have been obtained from both manual and system calculations are then presented in tabular form to facilitate accuracy analysis as shown in the table, while the data listed in the manuscript only takes the top 10 rankings and the bottom 10 rankings.

Table 5. Top 10 rangkings

No	Metode SAW				Metode TOPSIS			
	Manual		Sistem		Manual		Sistem	
	Alternatif	Nilai	Alternatif	Nilai	Alternatif	Nilai	Alternatif	Nilai
1	A29	24,6000	A29	24,6000	A29	0,7313	A29	0,7313
2	A19	24,0000	A19	24,0000	A19	0,7055	A19	0,7055
3	A39	24,0000	A39	24,0000	A39	0,6959	A39	0,6959
4	A56	23,6000	A56	23,6000	A56	0,6796	A56	0,6796
5	A11	23,4000	A11	23,4000	A54	0,6578	A54	0,6578
6	A9	23,4000	A9	23,4000	A11	0,6426	A11	0,6426
7	A25	23,2000	A54	23,2000	A25	0,6391	A25	0,6391
8	A54	23,2000	A25	23,2000	A42	0,6253	A42	0,6253
9	A42	22,8000	A42	22,8000	A9	0,6222	A9	0,6222
10	A33	22,4000	A33	22,4000	A44	0,6133	A44	0,6133

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Table 6. Bottom 10 rangkings

No	Metode SAW				Metode TOPSIS			
	Manual		Sistem		Manual		Sistem	
	Alternatif	Nilai	Alternatif	Nilai	Alternatif	Nilai	Alternatif	Nilai
1	A10	19,0000	A10	19,0000	A31	0,3975	A31	0,3975
2	A13	18,8000	A38	18,8000	A21	0,3915	A21	0,3915
3	A14	18,8000	A13	18,8000	A3	0,3872	A3	0,3872
4	A38	18,8000	A14	18,8000	A1	0,3860	A1	0,3860
5	A3	18,4000	A3	18,4000	A14	0,3824	A14	0,3824
6	A21	18,2000	A21	18,2000	A13	0,3699	A13	0,3699
7	A49	18,0000	A49	18,0000	A60	0,3620	A60	0,3620
8	A28	17,8000	A55	17,8000	A28	0,3379	A28	0,3379
9	A55	17,8000	A28	17,8000	A49	0,3351	A49	0,3351
10	A60	17,8000	A60	17,8000	A55	0,3266	A55	0,3266

Analysis based on ranking results obtained from the results of calculations manually and using the system. Tables are created to determine the amount of valid data between manual and system calculations. The white column indicates valid data and the blue column indicates invalid data. The SAW method in manual calculations gets 13 valid data by combining data from the top and lowest ranks, while the TOPSIS method gets 20 valid data from the entire combined data. Refers to the accuracy formula that has been described previously.

The results of the calculation of the accuracy obtained by the SAW method is 65% while the TOPSIS method gets a value of 100%. The SAW system basically has similar results, it's just that the order displayed on the system is not the same as the sequence generated in manual calculations with Excel, even though the non-valid data found basically have the same value. For example, in the manual SAW calculation the sequence starts with A13, A14 and A38, while in the reverse system the order becomes A38, A13 and A14. The three data get the same preference value, this is what then makes the order swapped. This of course will be very confusing for ordinary users and eventually raise doubts.

This is what ultimately makes the accuracy value of the SAW system lower. However, the SAW system has basically been running well and as expected. Compared with the TOPSIS accuracy value which gets 100%, it can be seen that TOPSIS does not get the same value as in SAW, this makes the TOPSIS system more precise considering the TOPSIS method which performs twice normalization in its calculations. The calculation results on the TOPSIS system do not get any difference at all from the results of the manual calculations which can be concluded that the TOPSIS system is running very well.

SAW and TOPSIS Accuracy Analysis

Accuracy analysis between SAW and TOPSIS was carried out by determining the accuracy rating parameters. The SAW and TOPSIS methods have differences, namely the SAW method still produces the same value, the similarity between the two is the value between different alternatives.

The SAW ranking results obtained some of the same data, to determine the accuracy according to the predetermined formula, then the data classification was not the same on SAW as in the table, while for TOPSIS only the top 10 samples and the bottom 10 rankings were shown because TOPSIS did not have the same value.

Based on the results of the classification of unequal value data, the SAW method has 24 unequal value data, while the TOPSIS method has 60 unequal value data from the overall ranking data. The unequal data is then entered into a previously determined formula to get the percentage of accuracy.

The results of the calculation of the accuracy of the two methods then found that the SAW method has an accuracy percentage value of 40%, while the TOPSIS accuracy reaches 100%. This proves that the TOPSIS method is better and more precise in terms of calculations because it performs normalization twice, so that the ranking results obtained do not have the same value. The TOPSIS method is considered the best and most accurate method in resolving cases regarding the selection/decision support, especially in the case of selecting the best employees.

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Table 7. Different Data Results of SAW

Alternatif	Nilai	Alternatif	Nilai
A29	24,6000	A20	20,6000
A19	24,0000	A4	20,4000
A56	23,6000	A6	20,2000
A11	23,4000	A43	20,2000
A25	23,2000	A50	19,8000
A42	22,8000	A31	19,6000
A33	22,4000	A12	19,4000
A7	22,2000	A32	19,2000
A23	22,0000	A10	19,0000
A30	21,8000	A13	18,8000
A35	21,6000	A3	18,4000
A36	21,4000	A21	18,2000
A48	21,2000	A49	18,0000
A17	21,0000	A28	17,8000

Table 8. Different Data Results of TOPSIS

Alternatif	Nilai	Alternatif	Nilai
A31	0,3975	A29	0,7313
A21	0,3915	A19	0,7055
A3	0,3872	A39	0,6959
A1	0,3860	A56	0,6796
A14	0,3824	A54	0,6578
A13	0,3699	A11	0,6426
A60	0,3620	A25	0,6391
A28	0,3379	A42	0,6253
A49	0,3351	A9	0,6222
A55	0,3266	A44	0,6133

CONCLUSION

System accuracy testing carried out on both methods gives the TOPSIS method a better accuracy value with an accuracy value of 100% compared to the SAW method which only gets an accuracy value of 65%. The reason is that the SAW method produces several of the same values, this makes the accuracy value of the SAW system lower, because the order of alternative values is not in accordance with manual calculations. Where as in TOPSIS, it is better because it does not produce the same value.

Testing the accuracy between the SAW and TOPSIS methods is carried out by taking parameters in the form of unequal values generated from both methods with 60 employee data. The SAW method produces 24 equal values while TOPSIS does not produce the same data from the 60 employee values.

The results of the accuracy test between the SAW and TOPSIS methods using 60 employee data showed that the SAW method got an accuracy value of 40%, while TOPSIS got an accuracy value of 100%.

The TOPSIS calculation value is considered more precise because it includes all the elements of the calculation, namely, weights, the amount of data, and the number of criteria and the TOPSIS is normalized twice so that it does not produce the same value.

Suggestion can be made for future research such as compare many more DSS methods to gain better accuracy or to make new methods that can be applied on DSS application so that the knowledge can be broadening

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