# Decision Support System Analysis Method *Technique For Preference By Order To Ideal Solution Similarity* (TOPSIS)

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## 1. Introduction

*1.1 Background*

In some circumstances, sometimes people are faced with several options. Such as selecting school, choose a subject, choose a place of residence, employment and others. Determining the choice was not easy, making indecisive and difficult to take decisions. And sometimes people pay less attention to the positive and negative impacts in making a decision, as well as the lack of attention to aspects or essential criteria required. Moreover, if the wrong decision, can be bad for the man himself. Therefore, it is necessary Decision Support Systems. Decision Support System (DSS) or *Decision Support System* (DSS) is a system that can provide problem-solving ability and the ability of communicating to a problem with the condition of semi-structured and unstructured. This system is used to assist decision-making in situations of semi-structured and unstructured situations, where no one knows for sure how the decision should be made (Turban, 2001). The method used by the author in the Decision Support System is a method *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS).

Method *Technique for Order Preference by Similarity to Ideal Solution*(TOPSIS) is one of multiple criteria decision making method which was first introduced by Yoon and Hwang in 1981. This method is one of many methods used to solve practical decision making. TOPSIS method has a concept whereby the selected alternative is the best alternative that has the shortest distance from the positive ideal solution and the farthest distance from the negative ideal solution. Based on the description above, the writer gave the title "Method Decision Support System Analysis *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS)". Scientific writing is to discuss the methods TOPSIS among others; how the data analyzer, the methods used to analyze each section and outputs produced. The author chose to use TOPSIS method in the study because the concept is simple and easy to understand, efficient computation, and has the ability to measure the relative performance of the alternatives in the decision of a simple mathematical form. Thus it is expected that this method will be able to consider the decision to alternatives and criteria based on the needs of each.

## 2. Basic Theory

*2.1 Review of Literature*

The review of the literature used by the author is as follows.

a. New Employee Recruitment Application TOPSIS Method at. Globalnine Indonesia (Amat Suroso, S. Kom, M. Kom and Mega Octa Setyawatie, Kom, Informatics Engineering Program STMIK Bekasi Bani Saleh 2016). Application design Recruitment New with software development using the model RAD *(Rapid Application* Development)and research methods *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS) resulted in a system that is expected to facilitate the management *of Human Resource* (HR) in the assessment of job candidates for decision-making and achieve the results are accurate and valid in the process of recruitment at PT. Globalnine Indonesia.

b. Decision Support System for Determining the Academic Achievement of Students with TOPSIS Method (Amelia Nur Fitriana, Harliana and Handaru, Informatics Engineering Program Polytechnic STIKOM Cirebon 2015). Modeling system design using *Data Flow Diagrams* (DFD), and research methods *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS). The result is this system can help the leaders of Darul MA MA sholeh in *reward* the best students.

c. *Application Of TOPSIS Method For Supplier Selection In Manufacturing Industry* (Jyoti Vimal, Vedansh Chaturyedi, and Ashutosh Kumar Dubey, from the *Department of Mechanical Engineering,*

*Madhav Institute of Technology and Science, Gwalior* 2012). Supplier selection decision support system in the manufacturing industry using TOPSIS method provides a useful approach for the manufacturing industry in choosing the best supplier.

d. *A New Car Selection in the Market using TOPSIS Technique* (Srikrishna S, Sreenivasulu Reddy and Vani S of the *Department of Mechanical Engineering, Sri Venkaeswara University College of Engineering, Tirupati, India* 2014). Choosing the best car using TOPSIS method is useful for consumers and producers in decision making.

## 3. Analysis Of Results And Discussion

In this study the authors analyzed four different journals with a case that includes the results and discussion using TOPSIS method. Results and discussion journals have been the author of an analysis of the four journals as follows.

*3.1 Analysis Results*

The results that have been the author of an analysis of the four journals as follows.

a. Journal of *the New Car Selection in the Market using TOPSIS Technique*

This journal is *the International Journal of Engineering Research and General Science* (2014) pages 177-181, 2014. ISSN 2091-2730 © journals written by Srikrishna S, Sreenivasulu Reddy, Vani S of the *Department of mechanical Engineering, Sri Venkaeswara University College of Engineering, Tirupati,* India. This journal has a case that the purchaser difficulty in buying a new car because of the many types and models of cars circulating in the market. Solution for cars based on criteria which determine the decision-making using TOPSIS method. The data used in this paper is data and data Weights Criteria. The data can be seen in Table 3.1 and Table 3.2 as follows.

Data criterion

**Table 1.** Criteria Value Parametric

| Attributes | | Alternatives | | | |
|---|---|---|---|---|---|
| | | MarutiErtiga | Swift | Tata Indica | Alto800 |
| Fuel Economy | City | 18kmph | 15.2kmph | 20kmph | 16kmph |
| | Highway | 22.2kmph | 18.6kmph | 24kmph | 21.7kmph |
| Style | | Better | Extreme | Good | Good |
| Life Span in Average | | 10yrs | 12yrs | 10yrs | 8yrs |
| Cost (Rs) | | 5.99 -8.77 lakhs | 4.58 - 6.9 lakhs | 4.20-5.3 lakhs | 2.5 – 3.6 lakhs |

Data weighted criterion

**Table 2.** Elements of Matrix Decision

| Alternatives | Criteria's | | | |
|---|---|---|---|---|
| | Style | Lifespan | Fuel economy | Cost |
| MarutiErtiga | 6 | 7 | 8 | 6 |
| Swift | 8 | 7 | 8 | 7 |
| Tata Indica | 7 | 9 | 9 | 8 |
| Alto800 | 9 | 6 | 8 | 9 |
| Weights | 0.1 | 0.4 | 0.3 | 0.2 |

Calculation process starts from the stage of building a decision matrix advance further calculates the decision matrix normalized, determines the decision matrix weighted, identify the ideal solution both positive and negative, to calculate the distance separating any competitive alternative from the positive

ideal solution and negative ideal solution, measuring the relative proximity of each location to the ideal solution, as well as the rank order of preference. This research resulted in the best car value sequence data. Here are the results of the calculation process TOPSIS in this journal.

Step 1to build a decision matrix. The first step of TOPSIS method involves building the Decision Matrix. In building a decision matrix used formula as follows

$$DM = \begin{array}{c} \\ L_1 \\ L_2 \\ \vdots \\ L_m \end{array} \begin{array}{cccc} C_1 & C_2 & \cdots & C_n \\ \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \end{array}$$

(1)

where 'i' is an index criteria (i = 1 m ...); m is the number of potential sites and 'j' is an alternative index (j = 1 ... n). Elements C1, C2 ..., Cn indicate the criteria: while L1, L2 ..., Ln shows at alternative locations. The elements of the matrix associated with the values associated with the alternative criteria j. In this paper builds a decision matrix shown in Table 3.1 and Table 3.2.

Step 2 Calculate the normalized Decision Matrix

**Table 3.** Normalized Value Matrix Decision

| Alternatives | Criteria's | | | |
|---|---|---|---|---|
| | Style | Lifespan | Fuel economy | Cost |
| MarutiErtiga | 0.40 | 0.48 | 0.48 | 0.40 |
| Swift | 0.53 | 0.48 | 0.48 | 0.46 |
| Tata Indica | 0.46 | 0.61 | 0.54 | 0.53 |
| Alto800 | 0.59 | 0.41 | 0.48 | 0.59 |

Table 3.In a decision matrix normalization results obtained from the data values shown in Table 3.2 and the results are applied to the two following equations.

Description:

$$normalisasi = \frac{nilai\ setiap\ alternatif\ pada\ kriteria}{\sqrt{jumlah\ seluruh\ nilai\ alternatif\ pada\ kriteria\ dikuadratkan}}$$

Step 3 Define the Decision Matrix Weighted

**Table 4.** Value Weighted Decision Matrix

| Alternatives | Criteria's | | | |
|---|---|---|---|---|
| | Style | Lifespan | Fuel economy | Cost |
| MarutiErtiga | 0.040 | 0.192 | 0.144 | 0.080 |
| Swift | 0.053 | 0.192 | 0.144 | 0.092 |
| Tata Indica | 0.046 | 0.244 | 0.162 | 0.106 |
| Alto800 | 0.059 | 0.164 | 0.144 | 0.118 |

Table 4 shows that after the results of normalizing the decision matrix tables 3.3 and then obtain the value of data calculated using equation three.

$Vij = Wj \times Rij$

Description:

$V_{ij}$= matrix normalized weighted

$W_i$= the weight value of each criterion

$R_{ij}$ = Data normalization

Step 4 Identify the Ideal Solution Positive And Negative

In Table 4 data values in the column criteria and then look for the highest value then determined as the ideal solution positive as well as the lowest value is determined as the ideal solution negative that can be seen in equation 4.

$A^+ = \{V1 +, V2 + ..., Vn +\}$

A. $= \{V1, V2 ..., Vn\}$, (2)

Description:

$A^+$ = ideal solution positive (data normalized weighted alternative on each criterion and then look for the highest value)

$A^-$ = negative ideal solution (data normalized weighted alternative on each criterion and then look for the lowest value)

in step 4, this journalized researchers did not explain the results.

Step 5 Calculate Distance Separation Competitive Alternatives Each of the Ideal Solution Ideal Solution Positive and Negative,

$S^+ = \{0058; 0057; 0.029; 0090\}$

$S^- = \{0047; 0.040; 0.083; 0019\}$

Outcome $S^+$ and $S^-$ is the ideal solution within the positive and negative ideal solution is calculated using the equation of five and six as follows.

$$S_{-} = \sqrt{\sum_{n=1}^{j} \left( V_j^- - V_{ij} \right)_2} \quad S_{+} = \sqrt{\sum_{n=1}^{j} \left( V_j^+ - V_{ij} \right)_2} \quad (3)$$

Description:

= distance ideal solution Positive

= distance ideal solution negative

summation streak

= ideal solution positive

= ideal solution Negative

= matrix normalized weighted

Step 6 Measure Proximity Relative of Each Location To Solution Ideal

$Ci = \{ 0:45; 0:41; 0.74; 0:17\}$

These results obtained from implementing the seven following equation.

$$C_i = S_i^- / (S_i^+ \quad S_{i+}^-) \quad (4)$$

Description:

= preference value of each alternative

= distance ideal solution Positive

= distance ideal solution negative

Step 7 Determine Ranked Sequence Preferences
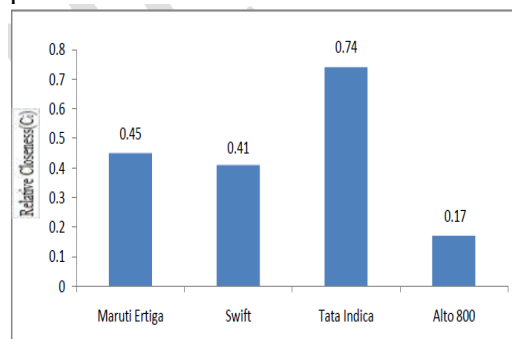


**Figure 1.** Histogram Car Different

Referring to Figure 3.1 shows that the car rank order the best earned by car Tata India with a value of 0, 74.

b.   Journal *Application Of TOPSIS Method For Manufacturing Industry Supplier Selection In*

this journal is *the International Journal of Research in Engineering & Applied Sciences, Volume 2, Issue 5 (May 2012) ISSN: 2249-3903.* Journal written by Jyoti Vimal, Vedansh Chaturyedi, and Ashutosh Kumar Dubey of the *Department of Mechanical Engineering, Madhav Institute of Technology and Science,* Gwalior.

This journal has a case that supply chain management trouble finding the best supplier for coordination between producers and an important supplier in the distribution channel. Solutions to choose the best supplier that is by decision using TOPSIS method. The data used in this paper is data Supplier Criteria and Weights Criteria, as well as data Supplier Information. The data can be seen in Table 3.5 and Table 3.6 below.

**Table 5.** Criteria Supplier And Weight Criteria

| Code | Criteria | Weight (%) |
|------|----------|-----------|
| $C_1$ | Minimum Quantity | 0.3 |
| $C_2$ | Maximum Quantity | 0.2 |
| $C_3$ | Defective item | 0.1 |
| $C_4$ | Late Delivery | 0.1 |
| $C_5$ | Product Price | 0.14 |
| $C_6$ | Order Quantity | 0.16 |

**Table 6** Information Suppliers

| Supplier→ Criteria ↓ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|------|------|------|------|------|------|------|------|------|------|------|
| $C_1$ | 500 | 600 | 400 | 700 | 100 | 800 | 300 | 225 | 115 | 350 |
| $C_2$ | 1000 | 1200 | 900 | 1400 | 400 | 1200 | 1100 | 550 | 300 | 800 |
| $C_3$ | 50 | 40 | 30 | 75 | 20 | 30 | 35 | 45 | 15 | 25 |
| $C_4$ | 75 | 50 | 60 | 80 | 25 | 70 | 85 | 65 | 26 | 68 |
| $C_5$ | 55 | 70 | 50 | 90 | 60 | 95 | 88 | 85 | 20 | 78 |
| $C_6$ | 700 | 800 | 600 | 1000 | 250 | 900 | 750 | 400 | 225 | 575 |

Should start counting from Build a decision matrix, Counting the decision matrix is normalized, Calculating weighted decision matrix is normalized, Determining the ideal solution positive and the ideal solution negative, Calculating separation step using Euclidean distance of m-dimensional, Counting proximity relative to the ideal solution and alternative ranked in descending order. The value of the final result obtained the first rank will be the best supplier. Here are the results of the calculation process TOPSIS in this journal. Step 1 Build decision matrix. In building the to rank the decision matrix, the matrix structure can be expressed in the following equation:

$$D = \begin{array}{c} \\ A_1 \\ \cdots \\ A_n \end{array} \begin{array}{cccc} B_1 & B_2 & \cdots & B_n \\ \left[ \begin{array}{cccc} P_{11} & P_{12} & \cdots & P_{1n} \\ \cdots & \cdots & \cdots & \cdots \\ P_{m1} & P_{m2} & \cdots & P_{mn} \end{array} \right] \end{array} \qquad (5)$$

Where $A_i$ indicates the alternative i, i = 1 ..., m .; $B_j$ represent attributes or criteria j, j = 1 ..., n, corresponds to the $i^{th}$ alternate .; $P_{ij}$ is a value indicating the rank of the performance of each alternative $A_i$ with respect to each criterion $B_j$. In this paper the decision matrix shown in Table 5 and Table 6.

Step 2 Calculate the normalized decision matrix

**Table 7.** normalized Decision Matrix

| Criteria → Supplier↓ | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ |
|------|------|------|------|------|------|------|
| 1. | 0.338 | 0.332 | 0.395 | 0.373 | 0.239 | 0.331 |
| 2. | 0.405 | 0.398 | 0.316 | 0.249 | 0.305 | 0.378 |
| 3. | 0.270 | 0.299 | 0.236 | 0.299 | 0.217 | 0.284 |
| 4. | 0.473 | 0.465 | 0.592 | 0.398 | 0.392 | 0.473 |
| 5. | 0.067 | 0.132 | 0.158 | 0.124 | 0.261 | 0.118 |
| 6. | 0.541 | 0.398 | 0.237 | 0.348 | 0.414 | 0.425 |
| 7. | 0.202 | 0.365 | 0.276 | 0.423 | 0.384 | 0.355 |
| 8. | 0.152 | 0.182 | 0.355 | 0.323 | 0.371 | 0.189 |
| 9. | 0.077 | 0.099 | 0.118 | 0.129 | 0.087 | 0.106 |
| 10. | 0.236 | 0.265 | 0.197 | 0.338 | 0.340 | 0.272 |

Table 7 In the decision matrix normalization results obtained from the data values shown in Table 6 and the results are applied to the equation two.

**$S_{ij} = P_{ij} / \sqrt{\Sigma (P^2_{ij})}$**

Description:

$$normalisasi = \frac{nilai\ setiap\ alternatif\ pada\ kriteria}{\sqrt{jumlah\ seluruh\ nilai\ alternatif\ pada\ kriteria\ dikuadratkan}}$$

Step 3 Calculate the weighted normalized decision matrix

**Table 8 Weighted Decision Matrix**

| Criteria →<br>Supplier↓ | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ | $C_6$ |
|---|---|---|---|---|---|---|
| 1. | 0.101 | 0.066 | 0.039 | 0.037 | 0.033 | 0.053 |
| 2. | 0.122 | 0.079 | 0.032 | 0.025 | 0.043 | 0.060 |
| 3. | 0.081 | 0.059 | 0.024 | 0.029 | 0.030 | 0.045 |
| 4. | 0.142 | 0.093 | 0.059 | 0.039 | 0.055 | 0.076 |
| 5. | 0.020 | 0.026 | 0.015 | 0.012 | 0.037 | 0.019 |
| 6. | 0.162 | 0.079 | 0.023 | 0.035 | 0.058 | 0.068 |
| 7. | 0.061 | 0.073 | 0.027 | 0.042 | 0.054 | 0.057 |
| 8. | 0.046 | 0.036 | 0.035 | 0.032 | 0.052 | 0.030 |
| 9. | 0.023 | 0.019 | 0.012 | 0.013 | 0.012 | 0.017 |
| 10. | 0.071 | 0.053 | 0.019 | 0.034 | 0.048 | 0.043 |

Table 3.8 shows that after the results of the decision matrix normalization table 7 and then obtain the value of data calculated using equation three.

**$V_{ij} = W_{ij} . S_{ij}$**

Description:

$V_{ij}$ = matrix normalized weighted

$W_{ij}$ = value of the weight of each criterion

$S_{ij}$ = Data normalization

Step 4 Determine the ideal solution positive and the ideal solution negative

V + = [0162, 0093, 0059, 0042, 0058, 0076]

V = [0.020, 0.019, 0.012, 0.012, 0.012, and 0.017]                                        (6)

From the above results indicate that the highest value in the column in the table specified criteria as a positive ideal solution and the lowest value is determined as a negative ideal solution that can be seen in the equation four.

V + = {v1 + ......... .. vn +} = {(Max VIJ I x J), (Min VIJ I j € J ')}

V = {v1- ......... .. vn-} = {(Min VIJ I j € J), (Max VIJ I j € J ')}                          (7)

Description:

$V^+$ = ideal solution positive (data normalized weighted alternatives on each criterion sought highest value)

$V^-$ = ideal solution negative (data normalized weighted alternatives on each criterion look for the lowest value)

Step 5 Calculating the separation step using m-dimensional Euclidean distance

**Table 9.** distance Solution Ideal Positive

| Supplier | $E^+ = [\Sigma\ (V_i^+ - V_{ij})^2]^{1/2}$ |
|---|---|
| 1. | 0.077 |
| 2. | 0.057 |
| 3. | 0.104 |
| 4. | 0.020 |
| 5. | 0.176 |
| 6. | 0.040 |
| 7. | 0.109 |
| 8. | 0.139 |
| 9. | 0.182 |
| 10. | 0.112 |

**Table 10** Distance Solution Ideal Negative

| Supplier | $E^- = [\sum (V_i - V_{ij})^2]^{1/2}$ |
|----------|----------------------------------------|
| 1. | 0.108 |
| 2. | 0.132 |
| 3. | 0.082 |
| 4. | 0.169 |
| 5. | 0.026 |
| 6. | 0.170 |
| 7. | 0.095 |
| 8. | 0.060 |
| 9. | 0.003 |
| 10. | 0.079 |

In Table 3.9 and Table 3.10 shows the ideal solution within the positive and negative ideal solution is calculated using the equation of five and six as follows.

$$E_i^+ = \sqrt{\sum_{n=1}^{j} (V_{ij} - V_j^+)_2}$$

$$E_i^- = \sqrt{\sum_{n=1}^{j} (V_{ij} - V_j^-)_2}$$

(8)

Description:
= distance ideal solution Positive
= distance ideal solution negative
summation streak
= ideal solution positive
= ideal solution Negative
= matrix normalized weighted
Step 6 Calculate the relative closeness to the ideal solution

**Table 11** Separation and coefficient Proximity Relative

| Suppliers | Closeness Coefficient $H^* = E^- / (E^+ + E^-)$ | Rank |
|-----------|-----------------------------------------------|------|
| 1. | 0.583 | 4 |
| 2. | 0.698 | 3 |
| 3. | 0.440 | 6 |
| 4. | 0.594 | 1 |
| 5. | 0.128 | 9 |
| 6. | 0.809 | 2 |
| 7. | 0.465 | 5 |
| 8. | 0.302 | 8 |
| 9. | 0.016 | 10 |
| 10. | 0.414 | 7 |

These results obtained from applying the equations of seven as following.

$$Hi * = \frac{E_i^-}{E_i^+ + E_i^-}$$

Note:
* = the value of the preferences of each alternative
= distance ideal solution Positive
= distance ideal solution negative
Step 7 ratings alternatives in order of
    the table 3:11 shows that of the top ten suppliers produce a final value that is a supplier of 4 had the best score among 10 suppliers with a score of 0.538.

c. Journal of Decision Support System To Determine Student Academic Achievement with TOPSIS Method
This journal is *CITEC* **Journal,** Vol. 2, No. 2 (2015) ISSN:*2354-5771.* Journal written by Amelia Nur Fitriana, Harliana, and Handaru of STIKOM Information Engineering Polytechnic Cirebon.

In this journal have a case that is the process of determining a student's academic achievement at MA Darul Masholeh still done manually with some constraints and tends to take a relatively long time. This is because the process of determining the only visible achievement from report value, and do not use any other reference to determine achievement, report value does not guarantee that the student is truly outstanding. In this case the researchers in the journal made a Decision Support System with TOPSIS method. The data used in this paper that the data value of each alternative against criteria and data Weights Criteria.

d. Journal Applications With New Employee Recruitment TOPSIS Method In. Globalnine Indonesia
This journal is Integrated Technology Journal Vol. 2, No. 1 (2016) ISSN*2477-0043*.Journal written by Amat Suroso, S. Kom, M. Kom, Mega Octa Setyawatie, S.Kom of  Informatics Engineering Program STMIK Saleh Bani, Bekasi.

In this journal have a case that the management of *Human Resource* (HR) still using *Microsoft Office Excel* in making assessments of new candidates, and do not have a particular model used in the decision-making so as to get an accurate and valid results in the process of recruitment. Researchers in this journal using TOPSIS method as a decision based on the criteria

*3.2 Discussion*
Based on the results that have been outlined four journals that contain cases and the results of calculations using TOPSIS method, the author analyzes that this journal has four stages, advantages and disadvantages. Stages, advantages and disadvantages can be seen as follows.

a.  Journal of *the New Car Selection in the Market using TOPSIS Technique*
Stages TOPSIS method in this paper is as follows:
1. Build a decision matrix
2. Calculating decision matrix normalized
3. Determining the decision matrix weighted
4. Identify Ideal Solution Positive and Negative
5. Calculate the separation distance of each alternative competitive than ideal solution positive and solution  negative ideal
6. Measure the relative proximity of each location to the ideal solution.
7. Determine the rank order of preference

The discussion in this journal to show the way of settling the accounts thorough and easy to understand, accurate calculation results.
Disadvantages:
In step three of this journal does not display the results of the calculations and the equation of the author in this journal made a different solution to the equation one but the results remain accurate calculation.

b.   Journal of *TOPSIS Method Of Application For Supplier Selection In Manufacturing Industry*
Stages TOPSIS method in this paper is as follows:
1. Build a decision matrix to rank
2. Calculates the decision matrix is normalized
3. Calculated weighted decision matrix is normalized
4. Determining the ideal solution positive and the ideal solution Negative
5. Counting separation step using Euclidean distance of m-dimensional
6. Calculating the relative closeness to the ideal solution
7. Determine the rank alternative in order of merit:

Displays the results of calculations with a thorough and accurate.
Disadvantages:

Not to showing how the settlement using TOPSIS method but rather by showing the final result, so as to make the reader difficulty in knowing calculation step TOPSIS method.

c. Journal of Decision Support System To Determine Academic Achievement of Students with methods TOPSIS

Stages TOPSIS method in this paper is as follows:

1. Determine the decision matrix that is normalized
2. Calculated decision matrix normalized weighted
3. Calculating matrix ideal solution positives and matrix ideal solution negative
4. Calculating the distance between the value of each alternative ideal solution matrix of positive and negative ideal solution matrix
5. calculating the value of preference for each alternative

Displays way of solving using TOPSIS method calculation step and calculating results thoroughly and clearly.

Disadvantages:

Not meet the calculation step on TOPSIS method, because in this journal on the outcome of a weighted normalization there are numbers that are not in accordance with the results of calculations authors carefully so as to implement the three results are not accurate measures. As well as in step four is not describing the results of each alternative, and five step does not show all the alternative value.

d. Journal Applications With New Employee Recruitment TOPSIS Method In. Globalnine Indonesia

Stages TOPSIS method in this paper is as follows:

1. Determine Matrix Decision normalized
2. Determining Matrix Decision normalized Weighted
3. Determining Matrix Ideal Solution Positive and Ideal Solution Negative
4. Determine the distance between the Value Weighted Each Alternative To The Ideal Solution Positive and Ideal Solution Negative
5. Determining the Value Preference for each Alternative

Advantages:

Exposing step TOPSIS calculation process with clear and easy to understand and accurate results based on data criteria.

Disadvantages:

Not to showing how the settlement using TOPSIS method but rather by showing the final result, so as to make the reader difficulty in knowing calculation step TOPSIS method. Of the four journals have been the authors describe the stages, advantages, and disadvantages, the authors observe that the journal's four of them have the best journal is a journal *Application Of TOPSIS Method For Manufacturing Industry In Supplier Selection* and Recruitment journal New Applications With TOPSIS Method In. Globalnine Indonesia. Because the journal is explained step TOPSIS calculation process with clear and easily understood, and its results are accurate. And journals that do not meet stages TOPSIS method shown in the journal Decision Support System for Determining the Academic Achievement of Students with TOPSIS Method. Because in this journal, the results weighted normalization no number is not in accordance with the results of calculations authors carefully so as to implement the three results are not accurate measures. And on the fourth and fifth steps, the journal does not expose the results of each alternative, but based on the criteria.

## 4  Conclusions And Recommendations

The conclusions and suggestions in this study are as follows.

*4.1 Conclusion*

From the results of the author of the current study the authors can draw some conclusions related to the research process as well as to the contents of the study itself, the conclusions obtained in this paper are:

a. Of the four journals authors investigated, it is concluded that the journal that describes TOPSIS method calculation process steps with clear, easy to understand and accurate result is a journal

*Application Of TOPSIS method For Manufacturing Industry in Supplier Selection* and recruitment journal New Applications with TOPSIS method in. Globalnine Indonesia.

b. With the decision support system using the method *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS), this method can help make decisions on election cases the best new car in the market, selecting the best suppliers in the manufacturing industry, determining a student's academic achievement, and acceptance of new employees.

*4.2 Suggestion*

Of this research is the next study is expected writer can build an application using the *Technique for Order Preference by Similarity to Ideal Solution* (TOPSIS) to help facilitate community, organization or company in making decisions quickly without having to do it manually.

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