Modeling of Decision Support System as an Assistant Tool in Selecting Health Equipment Suppliers with TOPSIS Method

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***Abstract*—Currently, the hospital realizes that in improving health services to patients is to provide services in the form of facilities and infrastructure for the needs of patients. Therefore, hospitals need cooperation with suppliers to procure patient needs such as medical devices and medicines. So far, the criteria used in the selection of suppliers only focus on price, resulting in the fulfillment of the supply of medical devices and medicines such as delays, inappropriate quality, and the number of medical devices ordered, causing the company to be unable to meet the demand for hospital capacity. The process of determining the selection of the right supplier can be done by many methods, one of which is by using the Order Preference by Similarity to Ideal Solution (TOPSIS) technique. The TOPSIS method is based on the principle that the chosen alternative must be the most similar to the positive ideal solution while being the most dissimilar to the negative ideal solution. This model provides a solution for the recommendation for determining the supplier of medical devices to the company according to the criteria specified at the beginning of the calculation. The criteria used in the form of quality, price, completeness, and updating, service and communication, ordering and payment, timeliness are indicators used in the selection of suppliers of medical devices and medicines. The TOPSIS method's results can be utilized as a model in a decision support system for supplier selection, to improve the quality of healthcare services**

Keywords— DSS, Selection of Medical Device Suppliers, MACDM TOPSIS

I. INTRODUCTION

Making decisions is a vital task that a firm must complete to avoid issues in associated operations that result in consumer complaints [1]. A corporation must make numerous selections, one of which is the selection of material suppliers to be utilized. [2][22]. Currently, Government and Private Hospitals realize that in improving health services to patients is to provide services in the form of facilities and infrastructure for the needs of patients. The quality of the facilities and infrastructure such as medical devices and medicines is very much needed for the treatment of the disease suffered by the patient. Therefore, the hospital requires cooperation with the supplier to procure patient needs such as medical devices and medicines. Many suppliers often offer cooperation with hospitals in terms of procurement of medical devices and medicines, but not all suppliers can provide quality services to meet hospital needs, such as frequent shortages of goods ordered by hospitals, availability of medicines - Incomplete and many types of medicines that do not match the doctor's request, difficult ordering methods, and untimely delivery. These problems have an impact on the quality of hospital services to patients in the process of healing and patient care. As a result, supplier selection is critical, where the proper supplier of goods must give optimal services in terms of responsiveness, fluid communication, and information, in addition to being able to supply quality, timely, and inexpensive rates. [2]. So, we need a model that can help in determining the supplier of medical devices [3].

A Decision Support System is a set of model-based data processing and assessment techniques that help decision-makers make quick and easy decisions in semi-structured and unstructured settings [6] [7].

The process of determining the right supplier selection can be done by many methods [4] [6] [7] [9] [10][23][24], and one of them is by using the Order Preference by Similarity to Ideal Solution (TOPSIS) technique. The TOPSIS technique is based on the idea that there are many different ways to solve a problem. The chosen one must be closest to the positive ideal solution and furthest away from the negative ideal solution. [9]. The options will be sorted by value so that the alternative that has the shortest distance from the positive ideal solution is the best alternative [11]. bigger is better chosen [12]. TOPSIS method is used as an effort to solve multicriteria decision making (MCDM) problems [12]. This is due to the concept's simplicity and ease [13] of comprehension, as well as its capacity to quantify the relative performance of various decisions. [14] [15] [20] [21].

So far, the criteria used in supplier selection only focus on price, resulting in the fulfillment of the supply of medical devices and drugs such as delays, inappropriate quality and the number of medical devices ordered, causing the company to be unable to meet demand, hospital capacity. Therefore, it is necessary to have a criterion and order of priority in the selection of suppliers in order to obtain suppliers who are able to meet the needs of the company. Therefore, how to find suppliers who can provide the best prices with good quality goods, have a complete range of products and many choices, provide updated products, provide good service, easy ordering, timely delivery, easy and safe payment methods and can communicate well.

II. LITERATURE REVIEW

Research Chou, S. Y., and Chang, Y. H. (2008) propose a decision support system for supplier selection that is aligned with the strategy and is based on a fuzzy SMART approach [4]. At PT. XYZ, knowledge study was conducted on the combination of demographic methodologies (decision making trial and evaluation lab) and ANP (analytical network process) in evaluating supplier performance [2]. While this paper covers the use of a decision support system model using the TOPSIS approach to pick vendors as medical device suppliers. It generates a solution that is close to perfect, and each possibility is weighed against a set of criteria. The purpose of using TOPSIS in this study is to accommodate the ambiguous nature of decision making by providing judgment that can overcome qualitative criteria uncertainty. The TOPSIS technique is employed because it yields a solution that is close to optimal, and each alternative is assessed using specified criteria.

III. METHODOLOGY

A. System Description

Decision support systems are a set of model-based techniques for transforming data into assessment findings to assist managers in making decisions. The decision support system must be simple, quick, easy to handle, and flexible, as well as address critical difficulties. [10] [19]. Decision support system as a tool in selecting medical equipment suppliers to maintain the quality of service to hospitals by using the TOPSIS method. Designing a Decision Support System model

B. Modeling Cycle

The systematics of designing the model in this study follows the modeling cycle as shown in Figure 1. As a first step in modeling the problem is done. Furthermore, based on the problem definition, a conceptual model was developed that demonstrates the relationship between the variables that influence the model's behavior, as well as a verbal model that solely defines the relationship between the study's problems, systems, and objectives. The study's purpose indicates the level of performance to be reached, while the conceptual model provides a framework that molds the expected level of performance. To put the conceptual model of quantitative symbolization and rule-making into practice. Idealization and the linking simplification of model variables are referred to as the model characterization stage. Model formulation, which is done using the TOPSIS approach in MACDM, is the first step in developing a formal model that reveals the magnitude of the model performance as a function of the model variables. Through a system approach, the existence of a system and its environment can be understood by knowing system elements, relationships between elements, and attributes of each element. The system environment is a collection of objects outside the boundary (system) that affect (influenced) the system. After the model's initial formulation is complete, the model's capacity to reproduce the properties and true behavior of the system under test is assessed. Validation of the model, which involves determining the structure of the relationships between the model variables. And the last is the implementation of a support system model for candidate decision suppliers of medical devices.

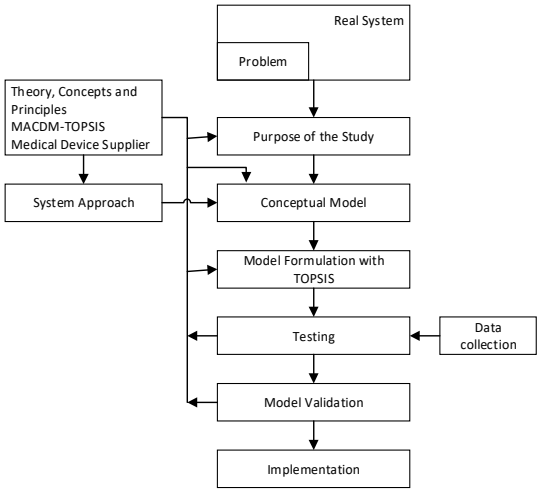

Fig 1. Modeling Cycle

The design of the supplier's health decision supplier support system model using the formulation model with the MACDM method - TOPSIS, which is input data parameters and weight, select alternatives, enter the value of each supplier based on parameters that include quality, price, accuracy and accuracy. Normalization of decision matrices from the evaluation results of health equipment suppliers (r_{ij}). Weighted normalization (Y_{ij}). Identify ideal positive solutions x (A^+) and negative ideal solutions (A^-). Calculate the distance between each alternative with positive ideal solutions and negative ideal solutions (D_i^+ and D_i^-) and then determine the value of each alternative's proximity to the ideal solution (V_i) to produce the highest value that can be used as a recommendation for the order of medical device suppliers that can be seen in figure 2.

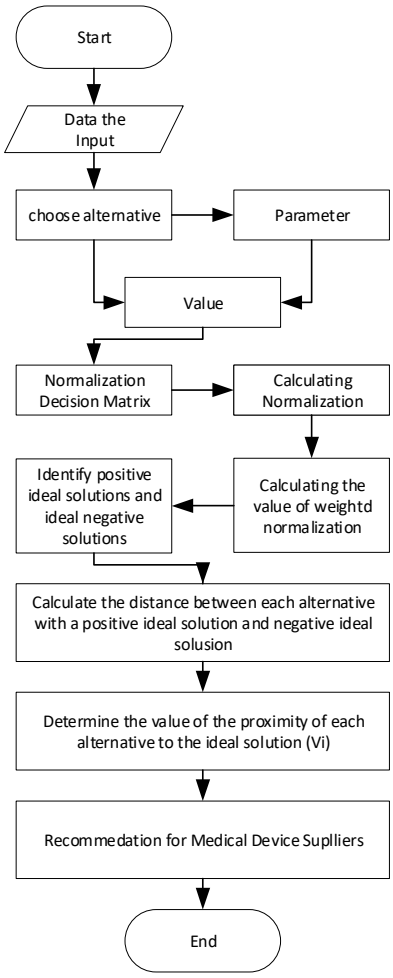

Fig 2. Flowchart of Decision Support System Model for Medical Device Suppliers with TOPSIS

C. TOPSIS Method

TOPSIS (Technique for Order Preference by Ideal Solution Similarity) is based on the concept that the best alternative has the smallest distance from a positive ideal solution and the greatest distance from a negative ideal solution. [11] [12] [13] [21] [22]

The TOPSIS method's steps are as follows [20]:

1. Determine criteria and characteristics
2. Determine the compatibility rating
3. Normalization Decision matrix

$$D = \begin{Bmatrix} X_{11} & X_{12} & X_{1n} \\ X_{21} & X_{22} & X_{2n} \\ X_{m1} & X_{m2} & X_{mn} \end{Bmatrix} \quad (1)$$

4. Performance rating of each alternative Ai on each normalized Cj criterion

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{m} x_{ij}^2}} \quad (2)$$

Value data |Xi| was produced by combining formula equation (2) with formula equation (3) and equation (4).

$$|Xi| = \sqrt{\sum_{i=1}^{m} x_{ij}^2} \quad (3)$$

$$R_{ij} = \frac{x_{ij}}{|Xi|}$$

$$R_{ij} = \frac{X_{ij}}{|Xi|} \quad (4)$$

4. Multiply the weight with the value of each attribute

$$Y_{ij} = W_i.R_{ij} \quad (5)$$

5. Calculate the matrix for the positive ideal solution and the matrix for the negative ideal solution.

positive ideal solutions

$$A^+ = \left(y_1^+, y_2^+, \square, y_n^+\right); \quad (6)$$

$$y_j^+ = \begin{cases} \max\limits_i y_{ij}; & \text{If J is a profit attribute} \\ \min\limits_i y_{ij}; & \text{If J is the cost attribute} \end{cases}$$

negative ideal solutions

$$A^- = \left(y_1^-, y_2^-, \square, y_n^-\right); \quad (7)$$

$$y_j^- = \begin{cases} \min\limits_i y_{ij}; & \text{If J is a profit attribute} \\ \max\limits_i y_{ij}; & \text{If J is the cost attribute} \end{cases}$$

6. Calculate the distance between each option's value and the positive and negative ideal solution matrices.

$$D_i^+ = \sqrt{\sum_{j=1}^{n} \left(y_i^+ - y_{ij}\right)^2}; \quad (8)$$

$$D_i^- = \sqrt{\sum_{j=1}^{n} \left(y_{ij} - y_i^-\right)^2}; \quad (9)$$

7. Determine the value of each alternative's preference.

$$V_i = \frac{D_i^-}{D_i^- + D_i^+}; \quad (10)$$

IV. RESULTS AND DISCUSSION

A. *Criteria Data*

The criteria used for the selection process to determine suppliers of medical devices can be seen in table I as follows

TABLE I. SUPPLIER ASSESSMENT CRITERIA

Code	Criteria
K0001	Quality
K0002	Price
K0003	Complete and Update
K0004	Service and Communication
K0005	Order and Payment
K0006	Punctuality

B. *Sub-criteria data*

- Quality

This quality criterion concerns the ability of suppliers to provide certainty and conformity between the quality and specifications of the goods offered, besides that there is a guarantee that the goods are not defective or that there is a system that guarantees returns for inappropriate items shown in the Table II.

TABLE II. QUALITY CRITERIA

Quality	Weight	Information
Corresponding	5	Suitability of goods with specifications that have been set, supply of goods without defects
Not Corresponding	4	Not in accordance with the specifications of the goods that have been specified, the existence of defective goods
Enough	3	Enough according to the specifications of the goods that have been set

- Price

Distribution companies rely heavily on the difference in purchase prices and selling prices in the sales process, because of this difference the company takes advantage. So that supplier selection is seen from the price offered by suppliers. The sub-criteria are shown in Table III.

TABLE III. PRICE CRITERIA

Sub Criteria	Weight
Expensive	5
Middle class	4
Cheap	3

- Complete and Update

The sub-criteria owned by the supplier for the complete type of product and many choices as well as the products that are owned in accordance with developments in the world of health are shown in table IV.

TABLE IV. COMPLETE AND UPDATE CRITERIA

Sub Criteria	Weight	Information
Complete and Update	5	Have complete products and goods that are owned in accordance with developments in the world of health
Complete	4	Products are available with many choices but are not in accordance with developments in the world of health
Update	3	Products according to the latest trends in the world of health but not complete
incomplete and updated	1	Incomplete and updated products

- Service and Communication

The service and communication sub-criteria in the process of procuring medical devices and medicines at the hospital are shown in table V.

TABLE V. SERVICE AND COMMUNICATION CRITERIA

Sub Criteria	Weight
Very well	5
Well	4
Enough	3
Not enough	2
Not good	1

- Order and Payment

The sub-criteria for the ease of carrying out the process of ordering payments for the procurement of medical devices and medicines at hospitals are shown in table VI.

TABLE VI. ORDER AND PAYMENT CRITERIA

Sub Criteria	Weight
Very well	5
Well	4
Enough	3
Not enough	2
Not good	1

- Punctuality

The sub-criteria for timeliness in the process of sending the ordered product can be seen in table VII

TABLE VII. PUNCTUALITY

Sub Criteria	Weight
Very well	5
Well	4
Enough	3
Not enough	2
Not good	1

The weight of preference given for each criterion can be seen in table VIII as follows:

TABLE VIII. SUPPLIER CRITERIA WEIGHT

Code	Criteria	Weight
K0001	Quality	5
K0002	Price	4
K0003	Complete and Update	4
K0004	Service and Communication	3
K0005	Order and Payment	2
K0006	Punctuality	4

In this study, the selection process for four suppliers of medical devices and hospitals was carried out as shown in table IX

TABLE IX. SUPPLIER ASSESSMENT DATA BASED ON CRITERIA

Code	K001	K002	K003	K004	K005	K006
A1	3	3	3	2	5	4
A2	5	3	5	5	3	5
A3	3	4	4	2	2	3
A4	3	3	3	2	1	2

Form a weighted normalized decision matrix using the equation (2). The calculation results are shown in the R matrix.

$$R=\begin{vmatrix} 0{,}42 & 0{,}46 & 0{,}39 & 0{,}33 & 0{,}80 & 0{,}54 \\ 0{,}69 & 0{,}46 & 0{,}65 & 0{,}82 & 0{,}48 & 0{,}68 \\ 0{,}42 & 0{,}61 & 0{,}52 & 0{,}33 & 0{,}32 & 0{,}41 \\ 0{,}42 & 0{,}46 & 0{,}39 & 0{,}33 & 0{,}16 & 0{,}27 \end{vmatrix}$$

Then proceed with multiplication with weights using the equation (5).

$$R= \begin{vmatrix} 0,42 & 0,46 & 0,39 & 0,33 & 0,80 & 0,54 \\ 0,69 & 0,46 & 0,65 & 0,82 & 0,48 & 0,68 \\ 0,42 & 0,61 & 0,52 & 0,33 & 0,32 & 0,41 \\ 0,42 & 0,46 & 0,39 & 0,33 & 0,16 & 0,27 \end{vmatrix} x \begin{vmatrix} \text{Criteria Weight} \\ 5, 4, 4, 3, 2, 3 \end{vmatrix}$$

$$R= \begin{vmatrix} 2,08 & 1,83 & 1,56 & 0,99 & 1,60 & 1,63 \\ 3,47 & 0,00 & 2,60 & 2,47 & 0,96 & 0,00 \\ 2,08 & 1,12 & 2,08 & 0,99 & 0,64 & 0,67 \\ 2,08 & 0,00 & 1,56 & 0,99 & 0,32 & 0,00 \end{vmatrix}$$

Determine the positive ideal solution (y max) using equation (6) and the negative ideal solution (y min) using equation (7)

Y_1^+= Max (2.08; 3,47; 2,08; 2,08)=3,47
Y_2^+= Max (1,83; 0; 1,12; 0) = 1,83
Y_3^+= Max (1,56; 2,60; 2,08; 1,56) = 2,60
Y_4^+= Max (0,99; 2,47; 0,99; 0,99) = 2,47
Y_5^+= Max (1,60; 0,96; 0,64; 0,32) = 1,60
Y_6^+= Max (1,63; 0; 0,67; 0) = 0

A^+ = (3,47; 1,83; 2,60; 2,47; 1,60; 1,63)

Y_1^-= Min (2.08; 3,47; 2,08; 2,08)=2,08
Y_2^-= Min (1,83; 0; 1,12; 0) = 0
Y_3^-= Min (1,56; 2,60; 2,08; 1,56) = 1,56
Y_4^-= Min (0,99; 2,47; 0,99; 0,99) = 0,99
Y_5^-= Min (1,60; 0,96; 0,64; 0,32) = 0,32
Y_6^-= Min (1,63; 0; 0,67; 0) = 0

A^- = (2,08; 0; 1,56; 0,99; 0,32; 0)

Calculate distances with positive ideal solutions using equation (8) is shown in table X.

TABLE X. VALUE OF POSITIVE IDEAL SOLUTION

D_1^+	2,28
D_2^+	2,53
D_3^+	2,60
D_4^+	3,59

Calculate distances with negative ideal solutions using equation (9) shown in table XI.

TABLE XI. VALUE OF NEGATIVE IDEAL SOLUTION

D_1^-	2,18
D_2^-	2,13
D_3^-	1,62
D_4^-	0,00

Determine the preference value of each alternative using equation (10)

$$V_1 = \frac{2,18}{2,28 + 2,18} = 0,49$$
$$V_2 = \frac{2,13}{2,53 + 2,13} = 0,46$$
$$V_3 = \frac{1,62}{2,60 + 1,62} = 0,38$$
$$V_4 = \frac{0}{3,59 + 0} = 0$$

Based on the preference value of each supplier, it can be concluded that V1 is supplier A1 has a value of 0.49, V2 is supplier A2 has a value of 0.46, V3 is supplier A3 has a value of 0.38 and V4 is supplier A4 has a value of 0. Supplier A1 is a supplier that has the best value from the other three suppliers.

V. CONCLUSIONS

The results of the test "Decision Support System for Determination of Medical Device Suppliers by Applying the Topsis Method" shows that this system can make decisions according to the criteria that exist in medical devices. This system provides a solution to the recommendation for the determination of the supplier of medical devices to the company in accordance with the criteria determined at the beginning of the calculation. The criteria used in the form of quality, price, complete and update, service and communication, order and payment, punctuality are indicators used in the selection of suppliers of medical devices and medicines. The results of supplier selection using the TOPSIS method can be used as a model in a decision support system in supplier selection which aims to improve the quality of hospital services.

REFERENCES

[1] ALAC, Patrik, 2015. Decision making and its importance in production planning within the word processing company, respectively in the whole supply chain. Procedia Economics and Finance, 2015, 34: 682-688.
[2] Yoserizal, Yosta, and Moses L. Singgih. "Integrasi metode dematel (decision making trial and evaluation laboratory) dan anp (analytic network process) dalam evaluasi kinerja supplier di PT. XYZ." Prosiding Seminar Nasional Manajemen Teknologi XV, Program Studi MMT-ITS, Surabaya. Vol. 4. 2012.
[3] GHODSYPOUR, Seyed Hassan; O'BRIEN, Christopher. A decision support system for supplier selection using an integrated analytic hierarchy process and linear programming. International journal of production economics, 1998, 56: 199-212.
[4] Chou, S. Y., & Chang, Y. H. (2008). A decision support system for supplier selection based on a strategy-aligned fuzzy SMART approach. Expert systems with applications, 34(4), 2241-2253.
[5] Weber, C. A., & Ellram, L. M. (1993). Supplier selection using multi-objective programming: a decision support system approach. International Journal of Physical Distribution & Logistics Management, 23(2), 3-14.
[6] Dweiri, F., Kumar, S., Khan, S. A., & Jain, V. (2016). Designing an integrated AHP based decision support system for supplier selection in automotive industry. Expert Systems with Applications, 62, 273-283.
[7] Kahraman, C., Cebeci, U., & Ulukan, Z. (2003). Multi-criteria supplier selection using fuzzy AHP. Logistics information management, 16(6), 382-394.
[8] Britton, K., Koseki, S., & Dutta, A. (2018). Expanding markets while improving health in Indonesia: the private health sector market in the JKN Era. Health Policy Plus Project, 69.
[9] Kar, M. B., Chatterjee, K., & Kar, S. (2014, July). A network-TOPSIS based fuzzy decision support system for supplier selection in risky supply chain. In 2014 Seventh International Joint Conference on Computational Sciences and Optimization (pp. 288-293). IEEE.
[10] Tarım, E. A., & Kandemir, E. K. (2017, October). Visual program application for supplier selection using fuzzy DEMATEL and fuzzy AHP. In 2017 International Conference on Computer Science and Engineering (UBMK) (pp. 1055-1060). IEEE.
[11] Rahim, R., Supiyandi, S., Siahaan, A. P. U., Listyorini, T., Utomo, A. P., Triyanto, W. A., ... & Khairunnisa, K. (2018, June). TOPSIS Method Application for Decision Support System in Internal Control for Selecting Best Employees. In Journal of Physics: Conference Series (Vol. 1028, No. 1, p. 012052). IOP Publishing.
[12] Rahim, R., Siahaan, A. P. U., Wijaya, R. F., Hantono, H., Aswan, N., Thamrin, S., ... & Sujito, S. (2018). Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method for decision support system in top management. Int. J. Eng. Technol, 7(3.4), 290-293.
[13] Meiriza, A., Ruskan, E. L., & Zulfahmi, R. (2019). Implementasi Metode Entropy dan Technique For Order Preference by Similarity to Ideal Solution (TOPSIS) dalam Pemilihan Biro Perjalanan Umroh. Teknomatika, 9(1).

[14] Kwok, P. K., & Lau, H. Y. (2019). Hotel selection using a modified TOPSIS-based decision support algorithm. Decision Support Systems, 120, 95-105.
[15] Rashidi, K., & Cullinane, K. (2019). A comparison of fuzzy DEA and fuzzy TOPSIS in sustainable supplier selection: Implications for sourcing strategy. Expert Systems with Applications, 121, 266-281.
[16] R. Puspasari, M. A. E. Nasution, B. Triandi, I. F. Rahmad and E. Ekadiansyah, "Decision Support System For Improving Electronic Pulse Buyer Services Based Sms Gateway," 2018 6th International Conference on Cyber and IT Service Management (CITSM), Parapat, Indonesia, 2018, pp. 1-7, doi: 10.1109/CITSM.2018.8674337.
[17] R. E. Sari, D. Y. H. Tanjung, John and H. Gunawan, "DSS in the Selection of Quality Snake Skin for Leathercraft," 2019 7th International Conference on Cyber and IT Service Management (CITSM), Jakarta, Indonesia, 2019, pp. 1-6, doi: 10.1109/CITSM47753.2019.8965405.
[18] R. E. Sari, A. Y. N. Harahap and A. Meizar, "Analizing Topsis Method for Selecting the Best Wood Type," 2018 6th International Conference on Cyber and IT Service Management (CITSM), Parapat, Indonesia, 2018, pp. 1-6, doi: 10.1109/CITSM.2018.8674263.
[19] Thanri, Y. Y. (2020). Rekam Jejak Kinerja Crew Sebagai Model Sistem Pendukung Keputusan Pengangkatan Leader. JURNAL MEDIA INFORMATIKA BUDIDARMA, 4(1), 96-102.
[20] Safrizal, S., & Susianto, S. (2019). Pengembangan Model Sistem Pendukung Keputusan Dengan Kombinasi Metode Fuzzy Tahani Dan Topsis Dalam Penilaian Kinerja Instruktur. J-SAKTI (Jurnal Sains Komputer dan Informatika), 3(2), 227-242.
[21] Tanti, L., Thanri, Y. Y., Adhar, D., & Fahrozi, W. (2019, November). Decision Support System Selection of Aviation Student Departments with TOPSIS method. In 2019 7th International Conference on Cyber and IT Service Management (CITSM) (Vol. 7, pp. 1-6). IEEE.
[22] Safrizal, S., Ambyar, A., & Verawardina, U. (2021). Development of Knowledge Sharing Model Using Decision Support System In Determine Feasible on the Job Training In Vocational School Using Vikor Method. IJISTECH (International Journal of Information System & Technology), 4(2), 583-590.
[23] Thanri, Y. Y., & Nasution, F. P. (2020). Model Sistem Pendukung Keputusan Dalam Menentukan Operator Caroline Officer Inbond 188 Terbaik dengan Metode AHP Dan SMART Berdasarkan Rekam Jejak Kinerja Operator. JURNAL MEDIA INFORMATIKA BUDIDARMA, 4(4), 1110-1118.
[24] Thanri, Y. Y., Sipahutar, L., Tanti, L., & Safrizal, S. (2021). SPK DALAM PEMILIHAN KARYAWAN TERBAIK MENGGUNAKAN METODE PADA PT. FANTASI ERESTAMA CEMERLANG. PUBLIDIMAS (Publikasi Pengabdian Masyarakat), 1(1), 85-91.