

The Control of skincare and bodycare inventory decisions using the Multi Attribute Utility Theory (MAUT) Method

Ismi Novitasari Sinaga

Department Technology and Business, Institut Teknologi dan Bisnis Carnegie, Indonesia

ARTICLE INFO

Article history:

Received May 28, 2024

Revised Jun 10, 2024

Accepted Jun 19, 2024

Keywords:

Bodycare;
Control;
Decision Support Systems;
Inventory;
Methods of Multi Attribute Utility Theory (MAUT).

ABSTRACT

Skincare is a series of facial skin care activities to maintain the health and appearance of the skin, as well as overcome various problems with skin. This activity consists of using several types of products, each of which has a different function according to its contents. In companies operating in the supply and trading sector, it is one of the core variables of business operations. Inventory management is also very important in company operations. Inventory that is not managed properly will cause many operational problems, such as running out of products or raw materials when needed, losing customers, losing goods, and other aspects of loss that can have a significant impact on the company. For this reason, this research aims to make decisions on controlling skincare supplies so that they can be guaranteed in sufficient quantities with decision support using the MAUT method. The data used in this research is the number of supplies that run out per day, per week, per month. It is hoped that the results of this research with the Multi Attribute Utility Theory (MAUT) method can help companies in making decisions on controlling skincare supplies very well.

This is an open access article under the [CC BY-NC](#) license.



Corresponding Author:

Ismi Novitasari Sinaga,
Institut Teknologi dan Bisnis Carnegie,
Yang Lim Building, Jl. Emas No.10, Sei Rengas II, Kec. Medan Area, Kota Medan, Indonesia
Email: Ismi.novita22@itbcarnegie.ac.id

1. INTRODUCTION

Decision Support Systems (DSS) are part of computer-based information systems (including knowledge-based) that are used to support decision making in an organization or company. SPK can also be said to be a computer system that processes data into information in making decisions on specific semi-structured problems (Khair et al., 2021). SPK aims to provide information, guide, provide predictions, and direct solution options to information users so they can make better decisions. SPK as a process for selecting the best alternative from several alternatives systematically to use as a way of solving problems with utilizing certain technology or systems (Jureksi et al., 2024). Decision-making is the result of problem solving faced firmly. The decision must be answered questions about what is being discussed in relationship with planning (Wardhani et al., 2020).

The MAUT method is one method that is part of Multi-Criteria Decision Making on SPK. The MAUT method uses there are many criteria that can help in important decision making. DEADLY method produces the best ranking of alternatives as well from the analysis of several existing criteria to be made as a guide in decision making (Chacon-Hurtado et al., 2021). The MAUT method is one of the methods used for making a decision where the method MAUT is a final evaluation scheme, $v(x)$ of an object is added to its defined weights as x with a value relevant to the value dimensions. The statement that usually calls it is utility value (Kurniawati et al., 2021). The MAUT method works for converting some interests into values numeric on a scale of 0-1 with 0 representing worst option and 1 best.

Related research was conducted by (Setiawan et al., 2019) problems related to determining tourist destinations, such problems are generally resolved by making decisions, to shorten the time potential visitors give their opinions by creating a support system for selecting tourist destinations. The solution to this problem is to provide extensive information and provide access for visitors to search for tourist attractions using mobile. The results of this research succeeded in implementing an application for selecting tourist destinations using Weighted Products, so that tourists obtain information on tourist locations and descriptions of the history of the tourist destination. Then other research was carried out by (Ningsih et al., 2019). The problem that occurs is that sometimes most visitors feel confused about determining the tourist attractions they want to visit in Simalungun Regency. Solutions to solve the problems listed, create applications that are able to recommend tourist destinations according to visitors' assessments. The results obtained are the Bukit Indah Simarjarunjung tourist attraction.

Based on the description of the problem and related research, the author will carry out the creation of a decision support system in processing inventory for skin care and body care using the MAUT (Multi-Attribute Utility Theory) method. The reason for using this method is because the MAUT method has better accuracy than methods generally used for decision making. Apart from that, before carrying out calculations, first determine the criteria that will be used as benchmarks in evaluating each product. Then the Multi-Attribute Utility Theory method is a technique that can combine appropriate risk cost measurements and facilitate the calculation of the relative ranking of all alternatives considered based on the decision maker's preference structure.

A quantitative comparison that combines the above measurements different risk costs and benefits with the MAUT method. Decision support using the MAUT method where a number of criteria must be taken into account when creating important decisions (Wardhani et al., 2020). This MAUT method can provide control decisions for the skincare and bodycare warehouse which will help make it easier to manage skincare and bodycare supplies (Ramdhani Yanuarsyah et al., 2021).

Inventory management is one thing It is important that the stock in the warehouse is available controlled. Inventory management process Both will also produce accurate information regarding existing stock of goods (Aldo et al., n.d.). Lack of skincare and bodycare is the most important problem for human skin, especially for women. Stock management Efficiency is one of the most important factors important in successful management as a whole, and aims to ensure it availability of skincare and bodycare. Planning is the key to successful management skincare and bodycare supplies.

Controlling skincare supplies is used with using the Economic Order Quantity method (EOQ) and Reorder Point (ROP) with data collected in the form of skincare documents and interviews with results varying between 13-383 units when reordering each skincare product. Employee performance assessment to motivate enthusiastic in doing every activity then The highest value obtained was 0.7918 and the highest value lowest 0.0435. Excess inventory will making the costs incurred become greater and is at risk of damage or expiration, meanwhile if the inventory is low it will be at risk unfulfilled demand so it will experienced a decrease in cost of income (Kurniawati et al., 2021). Then the Multi-Attribute Utility method Theory is a technique that can be combined accordingly on measuring risk costs and making it easier calculation of the relative ranking of all alternatives considered based on the maker's preference structure decision. Promotion positions processed using the MAUT method are obtained The result is that employees have the best value namely 0.84. So this research using the MAUT method to help companies in skincare and bodycare inventory management decisions (Khair et al., 2021).

2. RESEARCH METHOD

The method of writing structure is a very important element before the author reports the research results and discusses them in in the analysis paragraphs. Methodology research is an objective stage in determining data that will be useful for research. The framework provides steps and methods in conducting research (Chacon-Hurtado et al., 2021). The step of analyzing the problem is a step to be able to understand the problem that has been determined on scope. By analyzing the problem that has been determined, so that the problem can be resolved well understood (Widodo et al., 2019). The problems that arise are: how to determine which drugs and medical devices that need to be provided so that this does not happen stockpiling, expiration, and

shortages can be solved using the method MAUT (Siregar et al., 2022). After analyzing the problem, next how to determine the goals you want to achieve this research. This is intended to produce results obtained is not much different from the previous decision will be done later (Widiyawati et al., 2022).

The data collection stage is carried out by observation by looking directly at several skincare products which still hasn't expired within that time period It has been determined and also the skincare that runs out before specified schedule, then conduct an interview with skincare business owners (Putri Rahmayanti et al., n.d.). Gather the right data and divide the data into predetermined criteria. After carrying out the analysis and processing mechanism data using the MAUT method at the next stage a suitable system design is carried out. The criteria that have been set for the skincare and bodycare business will therefore be carried out by the designer using the PHP Programming Language and MySQL databases (369-1521-1-PB, n.d.). Then the next step is interpreting the data that has been collected, then do the planning through UML diagram before being implemented into in program form. The aim of implementing this system is to be able to give comparison results which obtained using manual methods with the system computerization.

The aim of implementing this system is to be able to give comparison results which obtained using manual methods with the system computerization (Sri Hayati et al., 2021): a) Determine skincare product inventory data from skincare companies, b) The data is then processed manually using the MAUT method with criteria and specified weight, c) The results obtained are then carried out testing with the system, by implementing The MAUT method uses skincare product data which will be adjusted for accuracy with data processing carried out manually, d) From the processed results the highest value can be obtained serves as a guideline for inventory control skincare products.

Next, carry out testing on skincare and bodycare product data by implementing it MAUT method manually or with a system which has been designed so that it can be towed conclusions regarding decisions regarding the supply of skincare and bodycare products.

3. RESULTS AND DISCUSSIONS

The data that has been analyzed will be processed using MAUT method regarding skincare product inventory control decisions. Next the process will be carried out system design in system creation Decision Support is useful for proving has the calculation process been carried out? appropriate or not (Zhai et al., 2020). The problem analysis in this research is determine which skincare products you need provided using the MAUT method. Some products have not been used up within the specified time period or the products have reached their expiration date and cannot be used anymore. then data the right data and divide the data into predetermined criteria.

he first step to take is to determine Criteria also determine the weight of each criterion which will be carried out in data processing using the MAUT method. criteria and weights for each The criteria used are presented in Table 1.

Table 1. Criteria and weight

No	Criteria	Weight
1	Skincare and bodycare run out in a month	1
2	Skincare and bodycare finished in a week	2
3	Skincare dan bodycare habis sehari Skincare and bodycare finished in a day	3
4	Lots of supplies	4

In Table 1 the criteria are obtained based on a questionnaire research that has been agreed upon by the skincare business owner. Weighting for the criteria weight column determined from the order of each criterion (Sutton et al., 2020).

Alternative data is data from skincare products which is taken from the skincare business. There are 350 types of skincare and 100 types of bodycare for alternatives required and processed in decisions inventory control. For each Criteria Value alternatives that will be used in processing data namely with the condition that 1 is the information value little, 2 medium description values, 3 description values quite a lot, and 4 description values is a lot, obtained from interviews with the

owner skincare and bodycare business (Rahmat Deddy Rianto et al., 2022). Where for alternatives and The skincare product data processing process only displays 10 and 10 for alternative bodycare products. On alternative data. These are presented in Table 2 and Table 3.

Table 2. Skincare alternatives

No	Alternative	alternative code
1	Wardah	A01
2	Make over	A02
3	Safi	A03
4	Emina	A04
5	Sari Ayu	A05
6	Skintific	A06
7	The Originote	A07
8	Davviena	A08
9	Ms Glow	A09
10	Hanasui	A10

Table 3. Bodycare alternatives

No	Alternative	Alternative Code
1	Scarlett Whitening	A31
2	Marina	A32
3	Nivea	A33
4	Vaseline	A34
5	WPL	A35
6	Diamante	A36
7	Grace and Glow	A37
8	Iswhite	A38
9	Jestham	A39
10	Shinzui	A40

In the Alternative Code column, it is abbreviated with letters and numbers, namely A1 to A40, where letters A stands for alternative and number taken from the number sequence of each alternative. After the alternative data is determined, the data is next For this alternative, matrix calculations will be carried out After obtaining alternative assessment data based on the criteria are converted into numbers, the goal to be included in the calculation analysis on each alternative using the method MAUT (Kumar, 2016). Results from conversion of alternative assessment data can be presented in Table 4 and Table 5.

Table 4. Skincare alternative number data

No	Alternati ve Code	Skincare run out in a month	Skincare run out in a week	Skincare run out in a day	Lots of supplies
		Bobot = 1	Bobot = 2	Bobot = 3	
1	A01	2	3	4	4
2	A02	4	3	4	4
3	A03	4	4	4	4
4	A04	4	2	3	3

No	Alternative Code	Skincare run out in a month	Skincare run out in a week	Skincare run out in a day	Lots of supplies
5	A05	4	3	2	3
6	A06	2	2	1	1
7	A07	2	2	1	1
8	A08	3	3	2	2
9	A09	2	1	2	2
10	A10	4	2	3	4

Table 5. Skincare Alternative Number Data

No	Alternative Code	Bodycare run out in a month	Bodycare run out in a week	Bodycare run out in a day	Lost of Supplies
		Bobot = 1	Bobot = 2	Bobot = 3	Bobot = 4
1	A31	3	2	4	4
2	A32	4	4	4	4
3	A33	3	2	3	3
4	A34	2	2	3	3
5	A35	2	2	1	3
6	A36	3	3	3	3
7	A37	4	4	3	2
8	A38	3	2	2	2
9	A39	3	3	2	2
10	A40	4	4	3	4

The stages of the matrix normalization process are carried out matrix normalization calculations. In order to make the calculation process easier with the MAUT method with normalization so can be determined in advance the highest value and the lowest value for each criterion where the highest value for skincare alternatives is K1 to with K4 you get 4, and for the lowest value K1 he got 1, K2 got 2, K3 got 1, K4 got 4, Next for the bodycare alternative, namely K1 up to K4 you get 4, and the lowest value for K1 you get 1, K2 you get 2, K3 you get 1 and for K4 we get 2. After obtaining the highest and lowest values on each alternative is calculated Matrix normalization is carried out by the calculation process.

Ranking of each alternative value that has been arranged from the highest value to the lowest value marked with an alternative code, so the owner Skincare businesses can find out and determine which skincare and bodycare are appropriate to provide so that there is no stock shortage.

Table 6. Ranking of skincare alternatives

No	Alternatif Code	Results	Rangking
1	A06	8.33	1
2	A07	8.33	2
3	A09	7.67	3
4	A01	7.33	4
5	A08	7.00	5
6	A10	7.00	6
7	A07	6.67	7
8	A04	6.67	8

No	Alternatif Code	Results	Rangking
9	A02	6.67	9
10	A13	5.67	10

Table 7. Ranking of bodycare alternatives

No	Alternative Code	Result	Rangking
1	A06	8.33	1
2	A07	8.33	2
3	A09	7.67	3
4	A01	7.33	4
5	A08	7.00	5
6	A10	7.00	6
7	A07	6.67	7
8	A04	6.67	8
9	A02	6.67	9
10	A13	5.67	10

In Tables 6 and 7 you can see the results of the ranking. The skincare alternative obtained the highest score was obtained with the value 8.33 is the 1st alternative with an alternative code A06 while the lowest value is obtained by value 5.67, namely with alternative code A13, for ranking bodycare alternatives. The highest score was obtained with a score of 8.67 alternative alternative code A35 meanwhile the lowest value was obtained with a value of 0.33, namely with alternative code A32.

After the ranking results are obtained, then go to carry out the decision making process for 30 skincare products and 10 bodycare products. Ranking results from the skincare and bodycare ranking table. The ranking of bodycare products was selected by 10 rankings alternative names for skincare products and 5 alternative names for bodycare products that need to be provided from all alternatives who processed using the MAUT method. Where the final result of skincare and bodycare inventory decisions which ones need to be provided in the research this can be seen in Table 8.

Table 8. Results of skincare inventory decisions

No	Code	Alternative	Result	Decision
1	A06	Skintific	8.33	Disediakan 1
2	A07	The Originote	8.33	Disediakan 2
3	A09	Ms Glow	7.67	Disediakan 3
4	A01	Wardah	7.33	Disediakan 4
5	A08	Davviena	7.00	Disediakan 5
6	A10	Hanasui	7.00	Disediakan 6
7	A05	Sari Ayu	6.67	Disediakan 7
8	A04	Emina	6.67	Disediakan 8
9	A02	Make over	6.67	Disediakan 9
10	A03	Safi	5.67	Disediakan 10

Table 9. Result of bodycare inventory decision

No	Code	Alternative	Result	Decision
1	A35	Vaseline	8.33	Disediakan 1
2	A39	Jestham	8.33	Disediakan 2
3	A31	Scarlett Whitening	7.67	Disediakan 3
4	A33	Marina	7.33	Disediakan 4
5	A34	Nivea	7.00	Disediakan 5

Results of analysis using the MAUT method in Skincare and bodycare inventory control decisions can result in decision choices Best for stocking skincare and bodycare products taken from 10 skincare product data and 5 bodycare product data with highest value that can be provided by skincare business owner.

4. CONCLUSION

Designing a Decision Support System by applying the MAUT method managed to provide recommendations to shop selectors to pick up decisions in selecting skincare and bodycare products. With the decision support system application in determining the selection of products that are suitable for marketing using the Multi Attribute Utility Theory method (DEATH), then the shop owner can be more objective in the assessment of product determination so can minimize the risk of complaints from customers. For further research, you can develop this research by conducting research that focuses on the implementation of the MAUT method will result in more accurate results when it is designed Decision Support Systems add the number of subcriteria variables, and increasing the number of alternatives. Future research can combine several methods as support Calculation of weight values so that ranking results are more accurate. Apart from a combination of methods, research can also be carried out with a focus on comparison of methods in determining final results.

REFERENCES

- 369-1521-1-PB. (n.d.).
- Aldo, D., Putra, N., Munir, Z., Studi Sistem Informasi, P., & Gici, S. (n.d.). *SISTEM PENDUKUNG KEPUTUSAN PENILAIAN KINERJA DOSEN DENGAN MENGGUNAKAN METODE MULTI ATTRIBUTE UTILITY THEORY (MAUT)*. Retrieved from <https://ejournal.stmikgici.ac.id/>
- Chacon-Hurtado, J. C., & Scholten, L. (2021). Decisi-o-rama: An open-source Python library for multi-attribute value/utility decision analysis. *Environmental Modelling and Software*, 135. doi: 10.1016/j.envsoft.2020.104890
- Jureksi, J., Menentukan Penerima Bantuan Lansia Berbasis Web, U., Lutfiyani, N., Sri Hayati, R., Kunci, K., & Pendukung Keputusan, S. (2024). Penerapan Metode Multy Attribute Utility Theory(Maut). *Januari*, 2(1), 337–350.
- Khair, F. El, Defit, S., & Yuhandri, Y. (2021). Sistem Keputusan dengan Metode Multi Attribute Utility Theory dalam Penilaian Kinerja Pegawai. *Jurnal Informasi Dan Teknologi*, 215–220. doi: 10.37034/jidt.v3i4.155
- Kumar, V. (2016). Perspective of Natural Products in Skincare. *Pharmacy & Pharmacology International Journal*, 4(3). doi: 10.15406/ppij.2016.04.00072
- Kurniawati, R. D., & Ahmad, I. (2021). SISTEM PENDUKUNG KEPUTUSAN PENENTUAN KELAYAKAN USAHA MIKRO KECIL MENENGAH DENGAN MENGGUNAKAN METODE PROFILE MATCHING PADA UPTD PLUT KUMKM PROVINSI LAMPUNG. *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, 2(1), 74–79. Retrieved from <http://jim.teknokrat.ac.id/index.php/JTSI>
- Putri Rahmayanti, N., & Pancasetia Banjarmasin, S. (n.d.). *MENJALANKAN BISNIS DENGAN STRATEGI GILA MARKETING SOCIETY 5.0*. Retrieved from <https://ejurnal.stimi-bjm.ac.id/index.php/BBJM/>
- Rahmat Deddy Rianto Dako, & Wrastawa Ridwan. (2022). Pengukuran Usability terhadap Aplikasi Tesadaptif.Net dengan System Usability Scale. *Jambura Journal of Electrical and Electronics Engineering*, 4(2).
- Ramdhani Yanuarsyah, M., & Napianto, R. (2021). ARSITEKTUR INFORMASI PADA SISTEM PENGELOLAAN PERSEDIAAN BARANG (STUDI KASUS: UPT PUSKESMAS RAWAT INAP PARDASUKA PRINGSEWU). *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, 2(2), 61–68. Retrieved from <http://jim.teknokrat.ac.id/index.php/JTSI>

- Siregar, V. M. M., & Sugara, H. (2022). SISTEM PENDUKUNG KEPUTUSAN PEMILIHAN SEPEDA MOTOR BEKAS MENGGUNAKAN METODE WASPAS. *Jurnal Teknik Informasi Dan Komputer (Tekinkom)*, 5(2), 263. doi: 10.37600/tekinkom.v5i2.393
- Sri Hayati, R., Lestari Rahayu, S., Sanjaya, A., Studi Informatika, P., Studi Rekayasa Perangkat Lunak, P., & Studi Informatika, P. (2021). Pemilihan Susu Formula Menggunakan Metode Multi Attribute Utility Theory (MAUT) Selection of Formula Milk Using the Method Multi Attribute Utility Theory (MAUT). *InfoSys Journal*, 6, 42–51.
- Sutton, R. T., Pincocock, D., Baumgart, D. C., Sadowski, D. C., Fedorak, R. N., & Kroeker, K. I. (2020). An overview of clinical decision support systems: benefits, risks, and strategies for success. In *npj Digital Medicine* (Vol. 3, Issue 1). Nature Research. doi: 10.1038/s41746-020-0221-y
- Wardhani, A. K., & Anindyaputri, A. (2020). SISTEM INFORMASI PEMILIHAN TEMPAT WISATA MENGGUNAKAN METODE WEIGHTED PRODUCT. *Indonesian Journal of Technology, Informatics and Science (IJTIS)*, 2(1), 27–32. doi: 10.24176/ijtis.v2i1.5649
- Widiyawati, D., Dedih, D., & Wahyudi, W. (2022). Implementasi Metode Maut Dan Saw Dalam Pemilihan Tempat Wisata Di Kabupaten Karawang. *Jurnal Interkom: Jurnal Publikasi Ilmiah Bidang Teknologi Informasi Dan Komunikasi*, 17(2), 71–80. doi: 10.35969/interkom.v17i2.231
- Widodo, W., & Nastoto, I. (2019). SISTEM PENDUKUNG KEPUTUSAN DENGAN MENGGUNAKAN MENGGUNAKAN METODE MULTI ATRIBUTE UTILITY THEORY (MAUT) UNTUK PENENTUAN BANTUAN RUMAH TINGGAL SEHAT. *Indonesian Journal of Business Intelligence (IJUBI)*, 1(2), 76. doi: 10.21927/ijubi.v1i2.911
- Zhai, Z., Martínez, J. F., Beltran, V., & Martínez, N. L. (2020). Decision support systems for agriculture 4.0: Survey and challenges. In *Computers and Electronics in Agriculture* (Vol. 170). Elsevier B.V. doi: 10.1016/j.compag.2020.105256
- Jureksi, J., Menentukan Penerima Bantuan Lansia Berbasis Web, U., Lutfiyani, N., Sri Hayati, R., Kunci, K., & Pendukung Keputusan, S. (2024). Penerapan Metode Multy Attribute Utility Theory(Maut). *Januari*, 2(1), 337–350.
- Khair, F. El, Defit, S., & Yuhandri, Y. (2021). Sistem Keputusan dengan Metode Multi Attribute Utility Theory dalam Penilaian Kinerja Pegawai. *Jurnal Informasi Dan Teknologi*, 215–220. doi: 10.37034/jidt.v3i4.155
- Kumar, V. (2016). Perspective of Natural Products in Skincare. *Pharmacy & Pharmacology International Journal*, 4(3). doi: 10.15406/ppij.2016.04.00072
- Kurniawati, R. D., & Ahmad, I. (2021). SISTEM PENDUKUNG KEPUTUSAN PENENTUAN KELAYAKAN USAHA MIKRO KECIL MENENGAH DENGAN MENGGUNAKAN METODE PROFILE MATCHING PADA UPTD PLUT KUMKM PROVINSI LAMPUNG. *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, 2(1), 74–79. Retrieved from <http://jim.teknokrat.ac.id/index.php/JTISI>
- Putri Rahmayanti, N., & Pancasetia Banjarmasin, S. (n.d.). *MENJALANKAN BISNIS DENGAN STRATEGI GILA MARKETING SOCIETY 5.0*. Retrieved from <https://ejournal.stimi-bjm.ac.id/index.php/BBJM/>
- Rahmat Deddy Rianto Dako, & Wrastawa Ridwan. (2022). Pengukuran Usability terhadap Aplikasi Tesadaptif.Net dengan System Usability Scale. *Jambura Journal of Electrical and Electronics Engineering*, 4(2).
- Ramdhani Yanuarsyah, M., & Napianto, R. (2021). ARSITEKTUR INFORMASI PADA SISTEM PENGELOLAAN PERSEDIAAN BARANG (STUDI KASUS: UPT PUSKESMAS RAWAT INAP PARDASUKA PRINGSEWU). *Jurnal Teknologi Dan Sistem Informasi (JTSI)*, 2(2), 61–68. Retrieved from <http://jim.teknokrat.ac.id/index.php/JTISI>
- Siregar, V. M. M., & Sugara, H. (2022). SISTEM PENDUKUNG KEPUTUSAN PEMILIHAN SEPEDA MOTOR BEKAS MENGGUNAKAN METODE WASPAS. *Jurnal Teknik Informasi Dan Komputer (Tekinkom)*, 5(2), 263. doi: 10.37600/tekinkom.v5i2.393
- Sri Hayati, R., Lestari Rahayu, S., Sanjaya, A., Studi Informatika, P., Studi Rekayasa Perangkat Lunak, P., & Studi Informatika, P. (2021). Pemilihan Susu Formula Menggunakan Metode Multi Attribute Utility Theory (MAUT) Selection of Formula Milk Using the Method Multi Attribute Utility Theory (MAUT). *InfoSys Journal*, 6, 42–51.
- Sutton, R. T., Pincocock, D., Baumgart, D. C., Sadowski, D. C., Fedorak, R. N., & Kroeker, K. I. (2020). An overview of clinical decision support systems: benefits, risks, and strategies for success. In *npj Digital Medicine* (Vol. 3, Issue 1). Nature Research. doi: 10.1038/s41746-020-0221-y
- Wardhani, A. K., & Anindyaputri, A. (2020). SISTEM INFORMASI PEMILIHAN TEMPAT WISATA MENGGUNAKAN METODE WEIGHTED PRODUCT. *Indonesian Journal of Technology, Informatics and Science (IJTIS)*, 2(1), 27–32. doi: 10.24176/ijtis.v2i1.5649
- Widiyawati, D., Dedih, D., & Wahyudi, W. (2022). Implementasi Metode Maut Dan Saw Dalam Pemilihan Tempat Wisata Di Kabupaten Karawang. *Jurnal Interkom: Jurnal Publikasi Ilmiah Bidang Teknologi Informasi Dan Komunikasi*, 17(2), 71–80. doi: 10.35969/interkom.v17i2.231
- Widodo, W., & Nastoto, I. (2019). SISTEM PENDUKUNG KEPUTUSAN DENGAN MENGGUNAKAN MENGGUNAKAN METODE MULTI ATRIBUTE UTILITY THEORY (MAUT) UNTUK PENENTUAN

BANTUAN RUMAH TINGGAL SEHAT. *Indonesian Journal of Business Intelligence (IJUBI)*, 1(2), 76.
doi: 10.21927/ijubi.v1i2.911

Zhai, Z., Martínez, J. F., Beltran, V., & Martínez, N. L. (2020). Decision support systems for agriculture 4.0: Survey and challenges. In *Computers and Electronics in Agriculture* (Vol. 170). Elsevier B.V. doi: 10.1016/j.compag.2020.105256