International Journal of Society Reviews (INJOSER) e-ISSN: 3030-802X
Vol. 1 No. 9 2024, pages: 904~911

LOCAL SHOE SELECTION DECISIONS WITH A DECISION SUPPORT SYSTEM USING THE SIMPLE ADDITIVE WEIGHTING METHOD

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ABSTRACT

Shoes are a basic need that is very essential in everyday life. provides protection, comfort and adaptability to a variety of activities and environments. (Juliana iHutapea iet ial., i2018) However, when choosing shoes, the task can become quite complicated considering the many choices and factors that need to be considered. In Indonesia, there are many local shoe brands, each with its own characteristics and appeal. The diversity of shoe models available often creates confusion for buyers, who are looking for shoes that suit their needs and preferences. (Mario i& iLero, in.d.) To overcome this challenge, this research aims for the same. to develop a decision support system designed to provide assistance to buyers in choosing shoes. This research involves three main criteria, namely price, comfort, and quality, which are considered key factors in carrying out the decision-making process. purchasing shoes. By applying the Simple Additive Weighting (SAW) method (Apriani iet ial., i2020), this research attempts to produce weights for each criterion and provide a ranking of shoes that could be the right choice. Thus, this decision support system is expected to have the ability to provide advice or recommendations. shoes that suit customers' needs and preferences, helping them overcome the confusion in choosing among the various shoe models available in the market.

Keywords: Method, SAW, SPK, Shoe, Local

INTRODUCTION

In this era of globalization, shoe selection has become an integral part of everyday life, reflecting individual preferences and needs. As a basic necessity, shoes are not just a fashion accessory; they involve deeper considerations such as protection, comfort, and adaptation to various activities and environments. In Indonesia, the diversity of local shoe brands makes a major contribution to the global shoe market, with each brand offering its own uniqueness and characteristics. (Indrawan iet ial., i2022)

Although this diversity provides opportunities, on the other hand, it also creates challenges for consumers. The process of selecting optimal local shoes is often complex, involving consideration of price, comfort level, and product quality. To overcome this complexity, this research will develop a Decision Support System (DSS)

using the Simple Additive Weighting (SAW) method. (Simatupang, i2018). This research aims to provide a systematic and objective solution to guide consumers in selecting local shoes. 5 main criteria, namely price, comfort, quality, size and availability will be the main focus in implementing the SAW method. By taking into account the weights for each criterion, it is hoped that this SPK can provide accurate and relevant recommendations, helping consumers overcome the complexity of choosing shoes. (Kehi iMetak iet ial., in.d.)

It is hoped that the success of conducting this research will provide a positive contribution. for the local shoe industry, making it easier for consumers to collect kep. In previous studies conducted by previous researchers, there was an in-depth analysis of the application of the SAW method. The relevant reference for this research came from Arie Setya Putra and the research team in 2018 with the title "SAW (Simple Additive Weighting) Method as a Decision Support System for High Achieving Teachers". The aim of the study is to create a system that supports decision making for assessing teacher performance at the web-based Global Surya Vocational School, by applying the Simple Additive Weighting (SAW) method. The research used six criteria, and the results showed that the A10 was selected as the best alternative from the existing options. The study was successful in carrying out alternative rankings of outstanding teachers based on weight calculations using the SAW.utusan method, as well as encouraging the growth of related economic sectors. Next, this research will explain in detail the stages of the method applied to achieve the goal. the. This reference provides a strong reference base for this research, showing that the SAW method has been successfully used previously for ranking alternatives in the context of teacher achievement decisions. (Setya iPutra iet ial., i2018)

The next research is entitled "Implementation of the SAW Method in the Decision Support System for Selection of Paper Plano" written by Rakhmat Dedi Gunawan et al in 2023. In this research, the aim is to provide assistance to admins in determining paper layout settings. without the need to carry out manual calculations individually, reducing fatigue and speeding up the customer handling process. By implementing a decision support system (DSS) using the Simple Additive Weighting (SAW) method. In the paper layout selection process, it is hoped that it can reduce the admin workload and increase efficiency in decision making regarding paper layout at CV Retina Khatulistiwa. This research uses four criteria for evaluation, and the results are expected to provide information equivalent to manual calculations and the use of Microsoft Excel, thereby supporting appropriate and accurate decisions. The difference lies in the ability of the Decision Support System to provide information on calculation results more quickly compared to calculations. manually. This speed is considered capable of improving the quality of service to customers. Apart from that, the Decision Support System is also considered easier to use when compared to calculations using Microsoft Excel, which may experience problems such as missing

formulas or not being saved as in the original formula. Although there are some differences in the ranking results in some calculation cases, however, the Decision Support System is considered to provide advantages in efficiency and ease of use. (Gunawan iet ial., i2023)

Further research conducted by Ni Kadek Sukerti in 2014 explained that assistance from the government to several villages was important. To reduce the risk of being wrongly targeted in providing assistance to villages that really need assistance, this research was carried out using 4 criteria with several indicators, with the result that 5 villages could be recommended as recipients of assistance with a score of 0.7900. (II, in.d.)

RESEARCH METHODS

The SAW method is often also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative from all criteria. (Sulistiya iPutra et al., 2019) This method requires the calculation step of normalizing the decision matrix (X) to a scale that can be compared with all existing alternative ratings. The SAW method recognizes two types of criteria, namely cost and benefit. Cost is a type of criterion that prioritizes the lowest value, while benefit is a type of criterion that prioritizes the highest value as a selection reference. (Pulungan iet ial., i2023) Procedures or steps for implementing the SAW method include [10]:

a. Determine the criteria (C) that will be used as a reference in decision making.
b. Provide a weight value (W) for each predetermined criterion.
c. Provide a suitability rating value for each alternative from all criteria

$$X= \begin{bmatrix} x11 & \cdots & xij \\ \vdots & \ddots & \vdots \\ x21 & \cdots & xij \end{bmatrix} \quad \text{equality (1)}$$

d. Calculating the decision matrix based on criteria (C), then a matrix normalization calculation is carried out based on an equation adjusted to the type of attribute (cost or benefit), so that the results of the normalized performance value matrix (rij) are obtained.

If j is the benefit attribute $R_{ij} = \frac{X_{ij}}{Max\ X_{ij}}$ equality (2)

If j is the cost attribute (cost) $R_{ij} = \frac{Min\ R_{ij}}{R_{ij}}$ equality (3)

The results of the normalized performance values (rij) form a normalized matrix (R).

$$R = \begin{bmatrix} r11 & \cdots & rij \\ \vdots & \ddots & \vdots \\ r21 & \cdots & rij \end{bmatrix}$$ equality (4)

e. The final result is obtained from the addition process of multiplying the normalized matrix (R) with the weight vector which is then ranked, so that the highest alternative value is obtained as the best solution.

$$V_i = \sum_{j=1}^{n} W_j r_{ij}$$ equality (5)

Information:

Vi : ranking for each alternative

Wj : weight value of each criterion

rij : normalized performance rating value

RESULTS AND DISCUSSION

Determining Criteria(C)

Determine the criteria that will be used as a reference for selecting the best teacher. These criteria are in Table 1.

Table 1. Criteria table

Code	Criteria
C1	Price
C2	Material
C3	Size
C4	Availability
C5	Quality

Determining Each Weight (W)

Determining the weight of each criterion uses percent. Criteria that are considered high priority are given a higher weight than criteria that are considered low priority. Table 2 is a table of the weight values for each criterion.

Table 2. Table of weight values

Criteria i	Description i	Weight
C1	Price	30%
C2	Material	20%
C3	Size	20%
C4	Availability	15%
C5	Quality	15%

Provide a suitability rating value for each alternative from all criteria

At this stage, teacher data is collected according to predetermined criteria. Table 3 is the suitability rating value for each alternative.

Table 3. Shoe data

Alternatif	Criteria				
	C1	C2	C3	C4	C5
A1	70	60	80	50	70
A2	80	70	70	80	50
A3	60	50	80	80	70

Normalizing Matrices (R)

Before carrying out the matrix normalization process, first determine the type of cost criteria or benefits. In this case, all the existing criteria are benefit criteria. (Indra iBorman, i2018) to make it easier for someone to find the shoes that best suit their preferences. There are five alternatives that will be evaluated in the shoe selection process, as listed in Table 1.

Price criteria (C1) – benefits
Max Xij value = {70;80;60} = 80
r11 = 0,875
r21 = 1
r31 =

Material criteria (C2) – benefits
Max Xij value = {60;70;50} = 70
r12 = 0,857
r22 = 1
r32 = 0,71

Size criteria (C3) – benefit
Max value Xij = {80; 70; 80} = 80
r13 = 1
r23 = = 0,875
r33 = = 1

Availability criteria (C4) – benefit
Max Xij value = {50;80;80} = 80
r14 = = 0,625
r24 = = 1
r34 = = 1

Quality criteria (C5) – benefits
Max Xij value = {70;50;70} = 70
r15 = = 1
r25 = = 0,714
r35 = = 1

After carrying out the process of normalizing the values of each alternative for each criterion, a normalization matrix is obtained as in table 4

Table 4. Normalization matrix table

	C1	C2	C3	C4	C5
R	0,875	0,857	1	0,625	1
	1	1	0,875	1	0,714
		0,714	1	1	1

Ranking

At the ranking stage there is a process of adding up the results of multiplying the normalized matrix with the weight values. The results of these calculations are then ranked. (Setiawansyah i& iSaputra, i2023) The alternative with the highest value is the best recommendation in determining decisions. The following is an example of the ranking process calculation:

$\mathbf{V_1}$ = (0,3)(0,875) + (0,2)(0,857) + (0,2)(1) + (0,15)(0,625) + (0,15)(1) = 0,877
$\mathbf{V_2}$ = (0,3)(1) + (0,2)(1) + (0,2)(0,875) + (0,15)(1) + (0,15)(0,714) = 0,932
$\mathbf{V_3}$ = (0,3)(0,75) + (0,2)(0,714) + (0,2)(1) + (0,15)(1) + (0,15)(1) = 0,867

Table 5. Ranking Results Table

Rank	Alternative	Value
1	A2	0,932
2	A1	0,877
3	A3	0,867

From the table above, it can be seen that A2 has the highest value among the other two alternatives. So from the case example above it can be concluded that the SAW method has provided the best recommendations for A2.

CONCLUSION

Indicates that (A2) has significant advantages compared to other shoe alternatives in terms of the value given to each criterion. Affordable price, excellent quality, and various factors such as size, availability, and optimal materials support a positive assessment of the shoes (A2).

Thus, the results of this research can provide valuable guidance for consumers, manufacturers, or related parties in making informed decisions regarding shoe selection. In addition, the application of the SAW method as an evaluation tool contributes to further understanding of how to analyze and compare alternatives based on relevant criteria. These implications can stimulate further research interest in the field of multi-criteria decision making related to the footwear industry.

REFERENCES

Apriani, N. D., Krisnawati, N., & Fitrisari, Y. (2020). Implementasi Sistem Pendukung Keputusan Dengan Metode SAW Dalam Pemilihan Guru Terbaik Implementation Of A Decision Support System With SAW Method In Selecting The Best Teacher. In *JACIS : Journal Automation Computer Information System* (Vol. 1, Issue 1).

Gunawan, R. D., Ariany, F., & Novriyadi. (2023). Implementasi Metode SAW Dalam Sistem Pendukung Keputusan Pemilihan Plano Kertas. *Journal of Artificial Intelligence and Technology Information (JAITI)*, *1*(1), 29–38. https://doi.org/10.58602/jaiti.v1i1.23 *II*. (n.d.).

Indra Borman, R. (2018). Sistem Pendukung Keputusan Menentukan Lokasi Perumahan Di Pringsewu Selatan Menggunakan Fuzzy Multiple Attribute Decision Making. In *JTKSI* (Vol. 01, Issue 01).

Indrawan, M. R., Mulyadi, M., & Furkan, L. M. (2022). PENGARUH CELEBRITY ENDORSER DAN ETNOSENTRISME KONSUMEN TERHADAP MINAT BELI SEPATU LOKAL "COMPASS" PADA MAHASISWA S1 DI INDONESIA. *Jurnal Riset Pemasaran*, *1*(1), 30–42.
https://doi.org/10.29303/jrp.v1i1.1752

Juliana Hutapea, B., Ananda Hasmi, M., & Karim, A. (2018). Sistem Pendukung Keputusan Penentuan Jenis Kulit Terbaik Untuk Pembuatan Sepatu Dengan Menggunakan Metode VIKOR. In *Jurnal Riset Komputer (JURIKOM)* (Vol. 5, Issue 1). http://ejurnal.stmik-budidarma.ac.id/index.php/jurikom|

Kehi Metak, T., de Rozari, P. E., Fanggidae, R. P., Manajemen, P., Ekonomi, F., & Nusa Cendana Kupang, U. (n.d.). *PENGARUH FAKTOR PRIBADI KONSUMEN TERHADAP KEPUTUSAN PEMBELIAN SEPATU VANS PADA KONSUMEN REMAJA DI KOTA KUPANG The Influence of Consumer Personal Factors to the Purchase Decision of Vans Shoes on Teenage Consumers in Kupang City Koresponden: a)*.

Mario, Y., & Lero, A. (n.d.). *Analisis Followers to Likes Ratio Tik Tok Pada 5 Brand Sepatu Lokal Indonesia Terbaik*.

Pulungan, A., Hendrik, B., Raya, J., Begalung, L., Xx, N., Lubuk Begalung, K., & Padang, K. (2023). Implementasi Metode SAW Pada Sistem Penunjang Keputusan Untuk Penerimaan Guru Di Pesantren Darul Mursyid. *Jurnal Penelitian Teknologi Informasi Dan Sains*, *1*(3), 47–53. https://doi.org/10.54066/jptis.v1i3.766

Setiawansyah, S., & Saputra, V. H. (2023). Kombinasi Pembobotan PIPRECIA-S dan Metode SAW dalam Pemilihan Ketua Organisasi Sekolah. *Jurnal Ilmiah Informatika Dan Ilmu Komputer (JIMA- ILKOM)*, *2*(1), 32–40. https://doi.org/10.58602/jima-ilkom.v2i1.16

Setya Putra, A., Rahma Aryanti, D., & Hartati, I. (2018). *Seminar Nasional Teknologi dan Bisnis 2018 IIB DARMAJAYA Bandar Lampung*.

Simatupang, J. (2018). *SISTEM PENDUKUNG KEPUTUSAN PENENTUAN KARYAWAN TERBAIK MENGGUNAKAN METODE SAW STUDI KASUS AMIK MAHAPUTRA RIAU*. *2*(1).

Sulistiya Putra, I., Ferdinandus, F., Bayu, M., Tinggi Teknologi Cahaya Surya Kediri, S., & Tinggi Teknik Surabaya, S. (2019). *Sistem Pendukung Keputusan*

Pemilihan Paket Pernikahan Dengan Metode Saw Berbasis Web (Vol. 8, Issue 2)