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Implementation of the Simple Additive Weighting (SAW) Method in a Decision Support System for Selecting the Chairperson of HIMA IFSI – S1

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ABSTRACT

The selection of the Chairperson of Student Association (HIMA) is a crucial process in student organizations as it influences policy direction and organizational sustainability. However, in practice, the selection process is often influenced by subjective factors, resulting in suboptimal decisions. Therefore, a method is needed to assist in making objective and measurable decisions. This study aims to implement the Simple Additive Weighting (SAW) method in a Decision Support System (DSS) for selecting the HIMA IFSI S1 Chairperson at STMIK Mardira Indonesia. This research employs a quantitative approach with data obtained through questionnaires using a Likert scale of 1-5. Three HIMA Chairperson candidates were assessed based on five criteria: leadership, organizational experience, responsibility, communication skills, and vision and mission.

The research results show that the SAW method can provide objective recommendations for HIMA Chairperson candidates based on the highest preference value. Alternative A2 obtained the highest preference value of 0.97, thus recommended as the HIMA IFSI S1 Chairperson. Therefore, the SAW method can be used as an effective decision-making tool in student organizational environments.

Keywords: Decision Support System; Simple Additive Weighting; HIMA Chairperson

ABSTRAK

Pemilihan Ketua Himpunan Mahasiswa (HIMA) merupakan proses penting dalam organisasi kemahasiswaan karena berpengaruh terhadap arah kebijakan dan keberlangsungan organisasi. Namun, pada praktiknya proses pemilihan Ketua HIMA sering kali masih dipengaruhi oleh faktor subjektivitas sehingga keputusan yang dihasilkan kurang optimal. Oleh karena itu, diperlukan suatu metode yang dapat membantu pengambilan keputusan secara objektif dan terukur. Penelitian ini bertujuan untuk menerapkan metode Simple Additive Weighting (SAW) dalam Sistem Pendukung Keputusan (SPK) untuk pemilihan Ketua HIMA IFSI S1 di STMIK Mardira Indonesia. Penelitian ini menggunakan pendekatan kuantitatif dengan data yang diperoleh melalui kuesioner menggunakan skala Likert 1-5. Penilaian dilakukan terhadap tiga calon Ketua HIMA berdasarkan lima kriteria, yaitu kepemimpinan, pengalaman organisasi, tanggung jawab, kemampuan komunikasi serta visi dan misi.

Hasil penelitian menunjukkan bahwa metode SAW mampu memberikan rekomendasi calon Ketua HIMA secara objektif berdasarkan preferensi tertinggi. Alternatif A2 memperoleh nilai preferensi tertinggi yaitu 0,97 sehingga direkomendasikan sebagai Ketua HIMA IFSI S1. Dengan demikian, metode SAW dapat digunakan sebagai alat bantu pengambilan keputusan yang efektif dalam lingkungan organisasi kemahasiswaan.

Kata kunci: *Sistem Pendukung Keputusan; Simple Additive Weighting; Ketua HIMA*

INTRODUCTION

Student organizations play an important role as a platform for developing leadership abilities, responsibility, and organizational skills among students. One of the strategic positions in student organizations is the Chairperson of the Student Association (HIMA), as the chairperson acts as the main decision-maker and determines the direction of organizational policy. Therefore, the selection process for the HIMA chairperson needs to be conducted objectively and measurably to produce leaders who align with organizational needs.

In reality, the selection process for the HIMA chairperson is often influenced by subjective factors, such as personal relationships, popularity, or assessments not based on clear criteria. This condition potentially leads to suboptimal decisions that do not fully reflect the comprehensive abilities of chairperson candidates. Selection not supported by a systematic assessment system can also trigger debates among organizational members.

Along with the development of information technology, Decision Support Systems (DSS) can be utilized to assist in decision-making processes involving multiple criteria. DSS are designed to provide recommendations based on data and specific methods so that the resulting decisions become more objective and rational. One of the methods frequently used in DSS is Simple Additive Weighting (SAW), because this method has a simple calculation concept, is easy to understand, and is capable of providing clear alternative ranking results.

The SAW method works by assigning weights to each assessment criterion and performing a normalization process on alternative values, thus producing preference values that can be used as the basis for ranking determination. By using this method, each HIMA chairperson candidate can be assessed fairly based on predetermined criteria, such as leadership, organizational experience, responsibility, communication skills, and vision and mission.

Based on these problems, this research aims to implement the Simple Additive Weighting (SAW) method in the Decision Support System for selecting the HIMA IFSI S1 Chairperson at STMIK Mardira Indonesia to obtain leaders who meet organizational needs.

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METHODOLOGY

This research was conducted by following systematic stages to produce an objective and measurable decision support system. The research methodology used consists of several stages as follows:

1. Preparation Stage

At this stage, identification of problems related to the selection of HIMA Chairperson which is still subjective was conducted. Then, a literature study was conducted on Decision Support Systems and the Simple Additive Weighting (SAW) method from various sources such as journals, books, and related documentation. The preparation stage also includes determining the research object, namely the selection of HIMA IFSI S1 Chairperson at STMIK Mardira Indonesia.

2. Determination of Criteria and Alternatives

Assessment criteria were determined based on the needs of HIMA organization in selecting competent leaders. The criteria used include: (1) Leadership (C1), (2) Organizational Experience (C2), (3) Responsibility (C3), (4) Communication Skills (C4), and (5) Vision and Mission (C5). All these criteria are benefit-type, meaning the higher the value of a criterion, the better the alternative.

The alternatives in this research are three HIMA Chairperson candidates coded as A1, A2, and A3 to maintain objectivity and confidentiality of candidate identities during the research process.

3. Data Collection

Data were obtained through questionnaires distributed to respondents who understand HIMA organizational activities, namely active organizational members and supervising lecturers. Questionnaires used a Likert scale with a range of values from 1 to 5, where value 1 indicates very low assessment and value 5 indicates very high assessment. Each respondent provided an assessment of each candidate based on the five predetermined criteria.

4. Data Processing with SAW Method

The data processing stage was carried out by following the steps of the SAW method as follows:

a. Preparation of Decision Matrix

Questionnaire values from each respondent were recapitulated and the average value was calculated for each alternative on each criterion. These average values were then arranged in the form of a decision matrix showing the assessment level of each HIMA Chairperson candidate on each respective criterion.

b. Determination of Criteria Weights

Criteria weights were determined based on the importance level of each criterion in selecting the HIMA Chairperson. Weights are expressed in percentage form with a total of 100%, then converted to decimal form for use in calculations.

c. Normalization of Decision Matrix

Since all criteria are benefit-type, normalization is performed by dividing the value of each alternative on a criterion by the maximum value on that criterion using the formula: $r_{ij} = X_{ij} / \max(X_{ij})$. The normalization process produces values between 0 and 1 indicating the relative superiority level of each alternative.

d. Calculation of Preference Value

Preference value (V_i) is obtained by multiplying the normalized result value with the weight of each respective criterion, then summing all the multiplication results. This preference value becomes the basis for determining alternative rankings.

5. Analysis and Conclusion Drawing

The results of preference value calculation were analyzed to determine the ranking of HIMA Chairperson candidates. The alternative with the highest preference value is recommended as the best candidate. The final stage is drawing conclusions regarding the effectiveness of implementing the SAW method in selecting the HIMA Chairperson.

RESULT AND DISCUSSION

1. Decision Matrix

The decision matrix was compiled based on the results of processing averaged questionnaire data. The values in the decision matrix indicate the assessment level of each HIMA Chairperson candidate on each respective criterion. The results of the decision matrix preparation can be seen in Table 1 below.

Table 1. Decision Matrix

Alternative	C1	C2	C3	C4	C5
A1	4	3	4	3	4
A2	5	4	5	4	5
A3	3	4	3	5	4

2. Determination of Criteria Weights

Criteria weights were determined based on the importance level of each criterion in selecting the HIMA Chairperson and expressed in percentage form (%) with a total of 100%. The determination of criteria weights can be seen in Table 2 below.

Table 2. Criteria Weights

No	Criteria	Description	Weight	Decimal
1.	C1	Leadership	25%	0.25
2.	C2	Organizational Experience	20%	0.20
3.	C3	Responsibility	20%	0.20
4.	C4	Communication Skills	15%	0.15
5.	C5	Vision and Mission	20%	0.20
Total			**100%**	**1.00**

The percentage weights were then converted to decimal form before being used in preference value calculations. Leadership criterion (C1) has the highest weight of 25% or 0.25 because leadership ability is considered most crucial in running the organization.

3. Normalization of Decision Matrix

Since all criteria are benefit-type, normalization is performed using the formula $r_{ij} = X_{ij} / \max(X_{ij})$, where the value of each alternative on a criterion is divided by the maximum value on that criterion. The normalization process is carried out for each criterion as follows:

a. For Leadership criterion (C1), the maximum value is 5. Thus, the normalization value for alternative A1 is 4/5 = 0.8; for alternative A2 is 5/5 = 1; and for alternative A3 is 3/5 = 0.6.

b. For Organizational Experience criterion (C2), the maximum value is 4. Thus, the normalization value for alternative A1 is 3/4 = 0.75; for alternative A2 is 4/4 = 1; and for alternative A3 is 4/4 = 1.

c. For Responsibility criterion (C3), the maximum value is 5. Thus, the normalization value for alternative A1 is 4/5 = 0.8; for alternative A2 is 5/5 = 1; and for alternative A3 is 3/5 = 0.6.

d. For Communication Skills criterion (C4), the maximum value is 5. Thus, the normalization value for alternative A1 is 3/5 = 0.6; for alternative A2 is 4/5 = 0.8; and for alternative A3 is 5/5 = 1.

e. For Vision and Mission criterion (C5), the maximum value is 5. Thus, the normalization value for alternative A1 is 4/5 = 0.8; for alternative A2 is 5/5 = 1; and for alternative A3 is 4/5 = 0.8.

4. Calculation of Preference Value

Preference value is obtained by multiplying the normalized result value with the weight of each respective criterion, then summing all the multiplication results. The results of preference value calculation and ranking can be seen in Table 3 below.

Table 3. Preference Value and Ranking

Alternative	C1	C2	C3	C4	C5	Total (Vi)	Rank
A1	0.2	0.15	0.16	0.09	0.16	0.76	3
A2	0.25	0.2	0.2	0.12	0.2	**0.97**	**1**
A3	0.15	0.2	0.12	0.15	0.16	0.78	2

Based on these calculation results, alternative A2 obtained the highest preference value of 0.97 and ranked first, thus recommended as the HIMA IFSI S1 Chairperson at STMIK Mardira Indonesia. Alternative A3 ranked second with a preference value of 0.78, and alternative A1 ranked third with a preference value of 0.76.

5. Discussion

The research results show that the Simple Additive Weighting (SAW) method is capable of assisting in the objective and systematic decision-making process for selecting the HIMA Chairperson. Alternative A2 obtained the highest preference value because it has superior values in most of the main criteria, especially in the Leadership (C1), Responsibility (C3), and Vision and Mission (C5) criteria, all of which received perfect scores (5) from the questionnaire assessment results.

The advantage of the SAW method in this research lies in its simplicity in performing calculations and ease in understanding the ranking process. This method also provides transparency in the assessment process because each calculation stage can be traced and verified. The normalization process carried out ensures that each criterion can be compared fairly even though they have different measurement units.

The determination of criteria weights in this research was conducted based on the importance level of each criterion in the context of student organizations. Leadership was given the highest weight (25%) because it is considered the most crucial factor in running the organization. Meanwhile, other criteria such as Organizational Experience, Responsibility, and Vision and Mission were each given a weight of 20%, while Communication Skills was given a weight of 15%. Thus, the SAW method can be used as an effective decision-making tool in student organizational environments.

CONCLUSION

Based on the research results, it can be concluded that the implementation of the Simple Additive Weighting (SAW) method in the Decision Support System for selecting the HIMA IFSI S1 Chairperson is capable of providing objective and measurable decision recommendations. This method produces rankings of HIMA Chairperson candidates based on the highest preference value, thus minimizing subjectivity in the selection process.

Alternative A2 was determined as the best candidate with a preference value of 0.97, followed by alternative A3 with a value of 0.78 and alternative A1 with a value of 0.76. The advantages of the SAW method lie in ease of calculation, process transparency, and its ability to integrate multiple criteria with different weights. This research demonstrates that the Decision Support System with the SAW method can be an effective solution to improve objectivity in the process of selecting leaders of student organizations.

For future research, it is recommended to develop an application-based system that can facilitate the assessment and calculation process automatically, as well as consider using other methods such as AHP (Analytical Hierarchy Process) or TOPSIS to compare results and decision validity.

REFERENCES

Kusumadewi, S., Hartati, S., Harjoko, A., & Wardoyo, R. (2006). *Fuzzy Multi-Attribute Decision Making (Fuzzy MADM).* Yogyakarta: Graha Ilmu.

Nofriansyah, D. (2014). *Konsep Data Mining vs Sistem Pendukung Keputusan*. Yogyakarta: Deepublish.

Turban, E., Sharda, R., & Delen, D. (2011). *Decision Support and Business Intelligence Systems* (9th ed.). Pearson Education.

Yoon, K. P., & Hwang, C. L. (1995). *Multiple Attribute Decision Making: An Introduction*. California: Sage Publications.

Zavadskas, E. K., & Turskis, Z. (2011). Multiple criteria decision making (MCDM) methods in economics. *Technological and Economic Development of Economy,* 17(2), 397–427. https://doi.org/10.3846/20294913.2011.593291