

Selection of the Best Futsal Player at the Bhirawa Cup Event Using the Simple Multi Attribute Rating Technique Method

Arjulian Fatah¹, Pradityo Utomo², Candra Budi Susila³

^{1,2,3}Informatics Management, Faculty of Engineering, Merdeka Madiun University, Madiun, Indonesia

Email: arjulianmgt@gmail.com¹, pradityo@unmer-madiun.ac.id², candra.budi89@gmail.com³

Received: August 11, 2025

Revised: August 25, 2025

Accepted: Sept. 19, 2025

Published: Sept. 30, 2025

Corresponding Author:

Author Name*:

Pradityo Utomo

Email*:

pradityo@unmer-madiun.ac.id

DOI: 10.63158/IJAIS.v2i2.40

© 2025 The Authors. This open access article is distributed under a (CC-BY License)



Abstract. The selection of the best futsal player is an important aspect of a tournament, as it can motivate athletes to continuously improve their performance. However, manual selection processes tend to be subjective and prone to bias, thus reducing the objectivity of the assessment results. This study aims to design and develop a web-based decision support system using the Simple Multi-Attribute Rating Technique (SMART) method to assist the organizing committee in objectively and standardizedly evaluating player performance at the Bhirawa Cup 2024 futsal event. The research method used is the Waterfall software engineering model, which consists of the stages of requirements analysis, system design, implementation, testing, and maintenance. The system evaluates player performance based on four main criteria: contribution to the team, number of fouls, attitude, and leadership, each of which is assigned a weight according to its level of importance. The result of this study is a web-based decision support system that can be used by the event committee to assess and determine the best player. The strength of this system lies in its ability to present structured data and minimize assessment subjectivity. A suggestion for future development is to make the system accessible online to increase its flexibility

Keywords: Best Futsal Player, Decision Support System, SMART

1. INTRODUCTION

In the world of sports, especially futsal, the selection of the best futsal player is one of the important aspects in giving awards to individuals who show the best performance. The selection of the best futsal player is often a subject of debate due to its subjective nature [1] and relies on manual assessments that are vague and not standardized in that they are determined by a neutral assessment team [2]. This can reduce the objectivity and trust of related parties in the results of the selection because the best player award can provide encouragement or motivation for athletes to continue to develop [3],[4]. Therefore, a system is needed that is able to assist the assessment process by using a method that is measurable, transparent, and accountable. The ranking results will be used as a reference for decision making [5].

The Bhirawa Cup event, an annual work program organized by the Student Executive Board of Universitas Merdeka Madiun. The high interest in futsal sports in recent years has encouraged the emergence of many new talents from various circles [6]. The increase in the number of participants and the quality of the game is certainly a challenge for the committee, especially in assessing individual performance as a whole. The process of calculating the best player, which has been done manually, is prone to error and bias, so it does not provide effective results and is often not objective [7]. Therefore, the committee needs a decision support system that can assist in making more informed decisions.

In this case, the utilization of information technology is very necessary. One of the scientific branches of information technology is the development of Decision Support Systems (DSS) [8],[9] by using the SMART method, which is a system used to make a decision that serves to assist in solving problems with semi- and unstructured conditions [10],[11], so that it aims to assist decision makers in making a decision [12].

In this research, the SMART method is applied in the development of a Website-based system which is a collection of pages that serve to display various information in the form of text, still or moving images, animation, sound, or a combination of all of them. These pages can be static or dynamic and are connected to each other through a network

of pages that form an interrelated structure [13]. A web-based system was chosen because it can simplify, speed up, and accurately process data [14], and improve efficiency in the assessment process. This system is designed to evaluate player performance based on several criteria, such as contribution to the team, number of fouls, attitude, and leadership. With this system, the process of selecting the best players can be done objectively, and transparently.

2. METHODS

This research flow consists of four stages, namely: Literature Study, relevant data collection, best player selection using SMART method, and Testing, as shown in Figure 1.

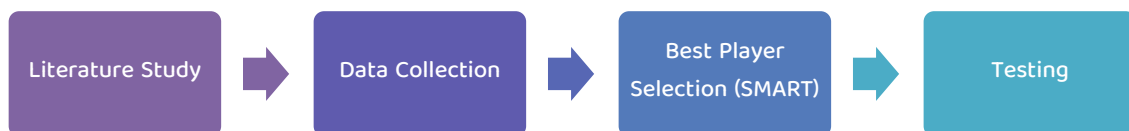


Figure 1. Research Flow

2.1. Literature Study

Researchers conducted a literature study of several journals to understand relevant methods in decision-making systems. Through this study, researchers can find out the advantages and disadvantages of each method that has been used in previous studies. The results of this literature study are the basis for choosing the most suitable method, namely SMART, to be applied in selecting the best futsal players. The results of the literature study were carried out by studying various decision-making methods, one of which is the Simple Multi Attribute Rating Technique (SMART) method. This study aims to understand how the SMART method can be used to help the process of objectively assessing and selecting the best players based on a number of predetermined criteria.

2.2. Data Collection

The results of data collection in this study were obtained through direct observation at the Bhirawa Cup event and official documentation from the committee. The data collected includes the value of each player based on four criteria, namely the number of goals, number of violations, attitude, and leadership. All of this data was then recapitulated in the form of an alternative table and used as the main input in the

calculation process. Data collection is carried out systematically and objectively so that the results obtained can describe the player's performance thoroughly and objectively.

2.3. Best Player Selection Using SMART Method

The SMART method is a multi-attribute decision-making technique used to assist decision makers in choosing between various alternatives in accordance with predetermined objectives. However, in certain situations, it is possible that there are sub-criteria related to the existing criteria [15]. The values are then averaged based on a predetermined scale. In addition, each attribute is given a weight that reflects its level of importance on the scale. This weighting and ranking is used to assess each alternative in order to obtain the best alternative [16]. The stages of the SMART method are as follows [17]:

- 1) Determine the alternatives and criteria that will be used to solve the decision-making problem.
- 2) Give weight to each criterion using a scale of 1 to 100 by paying attention to the most important priorities. After the weights are given, then calculate the normalization of the criteria weights of each criterion by means of the score on the criteria weight divided by the total criteria weight according to Equation 1.

$$\text{Normalization } i = \frac{W_j}{\sum W_j} \quad (1)$$

Description:

W_j = Criteria weight score

$\sum W_j$ = Total weights of all criteria

- 3) Provide a criteria score for each alternative. This criteria score can contain qualitative data or quantitative data (numbers). If the data is still qualitative, then the data will be made into lift/quantitative data first by creating parameter values on the criteria. Calculate the utility value by converting the criterion score for each criterion into the standardized data criterion score. For criteria with the benefit category, it is calculated with equation 2.

$$U_i(a_i) = \frac{(C_{out} - C_{min})}{(C_{max} - C_{min})} \quad (2)$$

Meanwhile, criteria with the cost category are calculated with Equation 3.

$$U_i(a_i) = \frac{(C_{max} - C_{out})}{(C_{max} - C_{min})} \quad (3)$$

Description:

$U_i(a_i)$ = utility score of the i-th criterion

C_{out} = i-th criteria score

C_{min} = minimum criteria score

C_{max} = maximum criteria score

- 4) Calculate the final score by adding up the total multiplication result of the normalization result of the criterion weight of the number obtained from normalizing the standard data criterion score with the normalization score of the criterion weight, as shown in Equation 4.

$$u(a_i) = \sum_{j=1}^m w_j * u_j(a_i) \quad (4)$$

Description:

$u(a_i)$ = alternative final score

w_j = normalization result of criteria weighting

$u_j(a_i)$ = value result of utility

- 5) Ranking

Ranking is the process of sorting the final values from largest to smallest. The best alternative is the alternative that gets the largest value.

2.4. Testing

In the testing stage, researchers use the blackbox testing method which is a method of testing software without having to pay attention to the details of the software. This test only checks the output value against the corresponding input value. This testing is needed to find out whether the program meets the requirements and runs as needed [18].

3. RESULTS AND DISCUSSION

3.1. Data Collection

Data collection in this study was carried out to obtain the information needed in the process of selecting the best futsal players at the Bhirawa Cup event. The data collected includes various assessment criteria and player data. The data collection methods used include observation, interviews with the committee, and documentation from the DSP (Standard Assessment List). This data is then used as input in calculations using the SMART method to produce objective results. The following is the criteria data used as shown in Table 1.

Table 1. Criteria Weight Table

No	Criteria Code	Nama Criteria	Criteria Name	Weight Attribute
1.	C1	Number of Goals	<i>Benefit</i>	0.3
2.	C2	Number of Fouls	<i>Cost</i>	0.3
3.	C3	Attitude	<i>Benefit</i>	0.2
4.	C4	Leadership	<i>Benefit</i>	0.2

The table 1 shows the assessment criteria for which there are four main criteria used, each of which has its own attributes and weights according to its level of importance. Criterion C1 (Number of Goals) has a benefit attribute with a weight of 0.3, which means that the more goals a player scores, the better his score will be. Criterion C2 (Number of Offenses) has a cost attribute with a weight of 0.3. Because it is a cost attribute, the fewer violations, the better the assessment. Criterion C3 (Attitude) is a benefit attribute with a weight of 0.2, assessing player behaviour or ethics during the match. Criterion C4 (Leadership) is also a benefit attribute with a weight of 0.2, which shows the captain has a positive influence on the team, with a total overall weight of 1 or 100%. This weighting will be used in the process of calculating the player's final score using the SMART method.

Table 2. Leadership Sub criteria Weight

No	Name of Sub Criteria	Value
1	Captain	2
2	Non-Captain	1

In the leadership criteria, two sub-criteria are used to provide a more specific assessment. The sub-criteria consist of Captain with a value of 2 and Non-Captain with a value of 1. Players who become captains are considered to have more responsibility in leading the team, so they are given a higher value. This assessment helps in measuring a player's non-technical contribution to the team more objectively.

Table 3 Attitude Sub criteria Weight Table

No	Name of Sub Criteria	Value
1	Good	2
2	Less	1

In the attitude criteria, two sub-criteria are used to assess player behavior and ethics. The sub-criteria consist of "good" with a score of 2 and "less" with a score of 1. Players who show good attitudes, such as sportsmanship, respect for referees and opponents, and discipline in playing, will get higher scores. This assessment aims to encourage players not only to excel technically, but also to behave positively on the field.

Table 4 Player Data Table

A_i	Name	Criteria			
		C1	C2	C3	C4
A1	Rizki Bima	1	0	2	1
A2	Muhammad Ilyas Fadly	0	0	2	1
A3	Tegar Bayu Wicaksono	0	0	2	2
A4	Angga Hendriawan Putra	3	1	1	1
A5	Dimas Agung Wibowo	0	2	1	1
A...
A24	Ribut Agus Santoso	2	0	2	1

The alternative data in this study consisted of 24 futsal players who entered the Final Grnad of the Bhirawa Cup event. Each player is identified using codes A_1 to A_{24} and assessed based on four predetermined criteria, namely the number of goals (C1), number of fouls (C2), attitude (C3), and leadership (C4). This data is taken from the Standard Assessment Document (DSP) used by the committee in the event, so it is official and

relevant to the context of the assessment. This data is then used as the basis for the calculation process using the SMART method to determine the best futsal players objectively.

3.2. Best Player Selection Using SMART Method

The selection of the best futsal players at the bhirawa cup event using the simple multi attribute rating technique method. Figure 1 shows the Player Data page of the designed system, where the admin has access to manage player data thoroughly. On this page, the admin can perform various actions such as adding new player data, editing existing player data, or deleting unnecessary data. This feature facilitates the process of managing player information so that the data used in the assessment process is always objective and up-to-date.

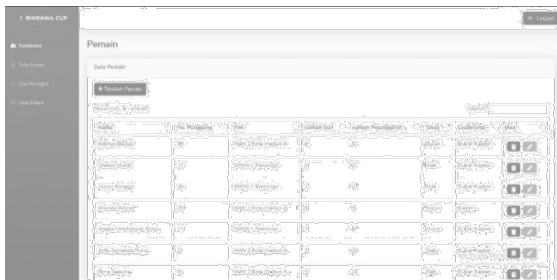


Figure 1 Page Data Player

Peringkat	Nama	No. Pemain	Tim	Jumlah Gol	Kategori Penanganan	Stap	Leadership	K1	K2	K3	K4	Nilai Akhir
1	Amanda Rizka	20	MSM 2 Kota Medan A	5	0	Back	Kapten	1	0.75	0	1	0.75
2	Adly Permana	2	MSM 2 Kota Medan A	7	0	Back	Kapten	0.4	1	1	0	0.62
3	Rizka Apri Sembel	26	MSM 2 Kota Medan A	1	0	Back	Kapten	0.4	1	1	0	0.62
4	Rina Gaudin	8	MSM 2 Kota Medan A	1	0	Back	Kapten	0.2	1	1	0	0.56
10	Rafhan Dha	1	MSM 2 Kota Medan A	0	0	Back	Kapten	0	1	1	0	0.5
12	Puqi Nuraida	5	MSM 2 Kota Medan A	0	0	Back	Kapten	0	1	1	0	0.5
14	Dia Princesa	24	MSM 2 Kota Medan A	0	0	Back	Kapten	0	1	1	0	0.5

Figure 2 Page ranking

Figure 2 is a ranking page showing the preference value which is the result of calculations using the SMART method. This page presents a table that displays the ranking of each alternative based on the final value (Vi). The greater the Vi value, the higher the preference level of the alternative. The ranking is determined based on the final value obtained by each alternative. The results of the player data in Table 4 can be converted into Matrix x as follows:

$$X = \begin{bmatrix} 1 & 0 & 2 & 1 \\ 0 & 0 & 2 & 1 \\ 0 & 0 & 2 & 2 \\ 3 & 1 & 1 & 1 \\ 0 & 2 & 1 & 1 \\ \dots & \dots & \dots & \dots \\ 2 & 0 & 2 & 1 \end{bmatrix}$$

To calculate the value, the normalization process of the decision matrix (X) is used. The normalization formula can be seen in Equation (2) and Equation (3). Based on this formula, the normalization calculation of the decision matrix can be obtained as follows:

First Column

$$r_{11} = \frac{(1 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{1}{5} = 0,2$$

$$r_{21} = \frac{(0 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{0}{5} = 0$$

$$r_{31} = \frac{(0 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{0}{5} = 0$$

$$r_{41} = \frac{(3 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{3}{5} = 0,6$$

$$r_{51} = \frac{(0 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{0}{5} = 0$$

...

$$r_{241} = \frac{(2 - (\min\{1; 0; 0; 3; 0; \dots; 2\}))}{(\max\{1; 0; 0; 3; 0; \dots; 2\} - \min\{1; 0; 0; 3; 0; \dots; 2\})} = \frac{2}{5} = 0,4$$

Second Column

$$r_{12} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 0)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{4}{4} = 1$$

$$r_{22} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 0)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{4}{4} = 1$$

$$r_{32} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 0)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{4}{4} = 1$$

$$r_{42} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 1)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{3}{4} = 0,75$$

$$r_{52} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 2)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{2}{4} = 0,5$$

...

$$r_{242} = \frac{((\max\{0; 0; 0; 1; 2; \dots; 0\}) - 0)}{(\max\{0; 0; 0; 1; 2; \dots; 0\} - \min\{0; 0; 0; 1; 2; \dots; 0\})} = \frac{4}{4} = 1$$

Third Column

$$r_{13} = \frac{(2 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{1}{1} = 1$$

$$r_{23} = \frac{(2 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{1}{1} = 1$$

$$r_{33} = \frac{(2 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{1}{1} = 1$$

$$r_{43} = \frac{(1 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{0}{1} = 0$$

$$r_{53} = \frac{(1 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{0}{1} = 0$$

...

$$r_{243} = \frac{(2 - (\min\{2; 2; 2; 1; 1; \dots; 2\}))}{(\max\{2; 2; 2; 1; 1; \dots; 2\} - \min\{2; 2; 2; 1; 1; \dots; 2\})} = \frac{1}{1} = 1$$

Fourth Column

$$r_{14} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{0}{1} = 0$$

$$r_{24} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{0}{1} = 0$$

$$r_{34} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{1}{1} = 1$$

$$r_{44} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{0}{1} = 0$$

$$r_{54} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{0}{1} = 0$$

...

$$r_{244} = \frac{(1 - (\min\{1; 1; 2; 1; 1; \dots; 1\}))}{(\max\{1; 1; 2; 1; 1; \dots; 1\} - \min\{1; 1; 2; 1; 1; \dots; 1\})} = \frac{0}{1} = 0$$

From the calculation process above, the normalized value for each criterion has been obtained. Furthermore, all the calculation results are arranged into a normalized matrix R.

$$R = \begin{bmatrix} 0,2 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 \\ 0,6 & 0,75 & 0 & 0 \\ 0 & 0,5 & 0 & 0 \\ \dots & \dots & \dots & \dots \\ 0,4 & 1 & 1 & 0 \end{bmatrix}$$

The final stage in this stage is to calculate the final value for ranking purposes, namely by adding up the results of the multiplication between the normalized matrix (R) and the weight vector which can be seen in equation 4. The highest value resulting from the calculation will be chosen as the best alternative.

$$V1 = Rizki Bima = (0,2 \cdot 0,3) + (1 \cdot 0,3) + (1 \cdot 0,2) + (0 \cdot 0,2) = 0,56$$

$$V2 = Muhammad Ilyas Fadly = (0 \cdot 0,3) + (1 \cdot 0,3) + (1 \cdot 0,2) + (0 \cdot 0,2) = 0,5$$

$$V3 = Tegar Bayu Wicaksono = (0 \cdot 0,3) + (1 \cdot 0,3) + (1 \cdot 0,2) + (1 \cdot 0,2) = 0,43$$

$$V4 = Angga Hendriawan Putra = (0,6 \cdot 0,3) + (0,75 \cdot 0,3) + (0 \cdot 0,2) + (0 \cdot 0,2) = 0,41$$

$$V5 = Dimas Agung Wibowo = (0 \cdot 0,3) + (0,5 \cdot 0,3) + (0 \cdot 0,2) + (0 \cdot 0,2) = 0,15$$

...

$$V24 = Ribut Agus Santoso = (0,4 \cdot 0,3) + (1 \cdot 0,3) + (1 \cdot 0,2) + (0 \cdot 0,2) = 0,62$$

From the results of the above calculations, Ananda Alnoer obtained the highest score of 0.725. the player with the highest score indicates that the player has the best value based on the weight of the criteria that have been determined, so that it can be used as the main alternative in decision making.

3.3. Testing

Through this Blackbox method, it is expected that the system developed is able to meet user needs optimally. Recap of system testing can be seen in Table 5.

Table 5 Blackbox testing

No	Test Scenario	Test	Test Expected	Conclusion
1.	Input the login data, namely username and password correctly.	<i>Username:</i> admin <i>Password:</i> admin123	The system accepts login access and displays the dashboard page	As expected
2.	Access the player data menu, add player data, change player data, and delete player data	Add, edit and delete player data	The system accepts input, update and delete player data commands.	As expected
3.	Access the criteria data menu, change the criteria data	Edit criteria data	The system receives updated criteria data.	As expected
4.	Accessing the ranking data menu, printing ranking data	Calculation process, ranking process and printing ranking results	The system receives access to receive and display ranking result data, and print ranking results	As expected
5.	Admin logout	<i>logout</i>	The system accepts exit access from the application.	As expected

Based on Table 5 System Testing, several test parameters have been carried out, including:

1. Input the username and password data correctly and then select the Login button
2. Inputting new player data on the player data page by selecting the 'Add Player' button then clicking the 'Save' button and changing player data on the player data page by selecting the 'Edit' icon button available on the action then clicking the 'Save' button. And delete player data by selecting the 'Trash' button icon.
3. Change the criteria data on the criteria data page by selecting the 'Edit' button icon available on the action then clicking the 'Save' button.
4. View the calculation data and ranking of the SMART method decision support system by clicking the ranking data menu and printing the results by clicking the 'Print' button
5. Log out by clicking the 'Logout' button.

3.4. Discussion

The findings of this study offer a different perspective compared to previous research, which primarily focused on decision support systems for selecting entire futsal teams. For example, a study by [19] used the Analytical Hierarchy Process (AHP) method for selecting school futsal teams, while [20] utilized the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method to select futsal players for the Bhineka FC Futsal Team.

One key difference from these studies is that most research has concentrated on the selection of entire futsal teams, whereas this study focuses specifically on the selection of individual futsal players using the Simple Multi-Attribute Rating Technique (SMART) method. This method stands out for its simplicity, effectiveness, and ability to handle multiple criteria with different weight levels, which allows for more objective, systematic, and transparent decision-making. This approach is particularly valuable in the context of futsal, where decisions need to be based on a variety of technical and non-technical factors.

The decision support system developed in this research, using the SMART method, is intended to be a professional and standardized tool for the selection of the best futsal players. While the system is designed for the Bhirawa Cup 2024, its flexibility makes it a

sustainable tool for future editions of the event as well, providing consistent and accurate results over time.

Data collection for this study involved gathering criteria and player data for the Bhirawa Cup event. The data collection methods included observations, interviews with the committee, and documentation from the Standard Assessment List (DSP). This data formed the basis for the subsequent calculations using the SMART method to produce objective and systematic results. The criteria used in the evaluation are outlined in Table 1, with each criterion assigned a specific weight according to its importance. The four main criteria used for assessing the players:

- 1) C1 (Number of Goals), with a weight of 0.3, where a higher number of goals contributes positively.
- 2) C2 (Number of Fouls), with a weight of 0.3, where fewer fouls contribute to a better assessment.
- 3) C3 (Attitude), with a weight of 0.2, assessing player behavior and ethics during the match.
- 4) C4 (Leadership), with a weight of 0.2, evaluating a player's leadership qualities and their influence on the team.

Additionally, sub-criteria were used to refine the evaluation of Leadership and Attitude (Tables 2 and 3). Leadership was assessed based on whether the player was a captain (value 2) or a non-captain (value 1), while Attitude was assessed based on whether the player displayed a good attitude (value 2) or a less positive attitude (value 1). These sub-criteria help evaluate a player's non-technical contributions to the team, offering a more comprehensive assessment.

The alternative data in this study consisted of 24 futsal players who participated in the final grand event of the Bhirawa Cup, each assessed according to the four criteria presented in Table 4. This data, drawn from the DSP, served as the foundation for the SMART method calculations that determined each player's final score. The decision matrix (X) was normalized to eliminate any bias due to differing scales in the criteria. This normalization process allowed for a fair comparison of players by adjusting their scores relative to the values within each criterion. The normalized data was then used to

calculate the final preference values (V_i) for each player. For example, as shown in the calculations, Rizki Bima received a final score of 0.56, and Ribut Agus Santoso scored 0.62, with the highest score being 0.725, achieved by Ananda Alnoer. This final score reflects the player's overall performance, factoring in the weighted importance of each criterion, allowing the committee to objectively select the top players.

The decision support system was thoroughly tested using the Blackbox testing method, ensuring that it met user needs and operated correctly. As shown in Table 5, the system was tested across several scenarios, including logging in, adding and editing player data, updating criteria, and viewing and printing ranking results. In each case, the system performed as expected, confirming its reliability and user-friendliness.

4. CONCLUSION

It can be concluded that the Simple Multi Attribute Rating Technique (SMART) method is able to make a significant contribution in the process of selecting the best futsal player at the Bhirawa Cup event. This method can help make decisions objectively, systematically, and measurably based on several predetermined assessment criteria, such as the number of goals, number of violations, attitude, and leadership. With the weighting and value normalization process, the SMART method is able to process player data fairly and produce a final ranking that can be used as a basis for determining the best player. Therefore, this method can be used in similar activities that require multi-criteria assessment objectively and transparently.

ACKNOWLEDGMENT

The authors would like to thank themselves for the perseverance, patience, and enthusiasm that were maintained throughout the process of preparing this research, despite the challenges and limitations. I would also like to express my gratitude for all the learning and valuable experiences gained during this process. My deepest gratitude also goes to the supervisor, Mr. Pradityo Utomo, who has provided direction, guidance, and motivation consistently from the beginning to the end of the preparation of this

final project. The guidance given is very meaningful in deepening the author's understanding and completing this research well.

REFERENCES

- [1] O. Iskandar, G. Abdillah, and A. Komarudin, "Rekomendasi Pemilihan Pemain Sepak Bola Terbaik Pada Liga X Menggunakan Metode Topsis," *Prosiding SISFOTEK*, pp. 187–192, 2020.
- [2] D. S. Anwar, "Sistem Pendukung Keputusan Pemilihan Pemain Terbaik Pada Ariadikusumah Cup Menggunakan Metode Topsis," *Seminar Nasional CORIS 2022*, Sep. 2022.
- [3] M. S. Anam, Y. B. Utomo, and H. Kurniadi, "Sistem Pendukung Keputusan Seleksi Pemain Futsal dengan Menggunakan Metode Naive Bayes," *Jurnal Teknologi dan Sistem Informasi*, vol. 11, no. 1, pp. 97–103, 2025.
- [4] M. N. D. Satria, "Sistem Pendukung Keputusan Penerimaan Staff Administrasi Menggunakan Metode VIKOR," *Jurnal Artifisial Intelligence Teknologi Informasi*, vol. 1, no. 1, pp. 39–49, 2023, doi: 10.58602/jaiti.v1i1.24.
- [5] Ilham, I. G. Suwijana, and Nurdin, "Sistem Pendukung Keputusan Penerimaan Beasiswa Pada SMK 2 Sojol Menggunakan Metode AHP," *Jurnal Elektronika Sistem Informasi dan Komputasi*, vol. 4, no. 2, pp. 48–58, 2018.
- [6] B. Setiawan, U. Wahyudi, and G. Fitriady, "Hubungan Minat Siswi Mengikuti Kegiatan Ekstrakurikuler Futsal Dengan Hasil Belajar PJOK di SMA/SEDERAJAT Se-Kota Batu," *Jurnal Ilmu Keolahragaan*, vol. 5, no. 3, pp. 542–551, 2024.
- [7] I. P. D. Suarnatha, "Sistem Pendukung Keputusan Seleksi Ketua BEM Menggunakan Metode Profile Matching," *Jurnal Sistem Informasi Manajemen*, vol. 4, no. 2, pp. 73–80, 2023, doi: 10.24076/joism.2023v4i2.952.
- [8] P. Utomo and A. Budiman, "Penerapan Metode Weighted Product (WP) Dalam Pendukung Keputusan Pemilihan Rektor Unmer Madiun," *Jurnal Komputer dan Sistem Teknologi Manajemen*, vol. 3, no. 2, pp. 74–82, 2020.
- [9] P. Utomo and D. N. Amadi, "Pemilihan Tanaman Pangan Untuk Ketahanan Pangan Masa Pandemi Dengan Simple Additive Weighting Di Kabupaten Madiun," *Fountain Informatics Journal*, vol. 5, no. 3, pp. 12–16, 2020, doi: 10.21111/fij.v5i3.4924.

- [10] M. D. Damara and S. N. Anwar, "Sistem Pendukung Keputusan Dengan Metode Profil Matching Untuk Seleksi Pemain Futsal (Studi Kasus Di Asosiasi Futsal Kota U-19 Jepara)," *Sendiu*, pp. 978–979, 2020.
- [11] P. Utomo, S. D. Cahyono, Sutomo, and T. Tristono, "Selection of Talented Archery Athletes Using Weighted Product Method," in *Journal of Physics: Conference Series*, 2019. doi: 10.1088/1742-6596/1211/1/012037.
- [12] J. D. Manik, A. R. Samosir, and M. Mesran, "Penerapan Metode Simple Additive Weighting dalam Penerimaan Siswa Magang Pada Universitas Budi Darma," *Sudo Journal of Technical Informatics*, vol. 1, no. 2, pp. 51–59, 2022, doi: 10.56211/sudo.v1i2.14.
- [13] Rina Noviana, "Pembuatan Aplikasi Penjualan Berbasis Web Monja Store Menggunakan PHP dan MySQL," *Jurnal Teknik dan Sains*, vol. 1, no. 2, pp. 112–124, 2022, doi: 10.56127/jts.v1i2.128.
- [14] S. Fauziah and Y. Sugiarti, "Literature Review: Analisis Metode Perancangan Sistem Informasi Akademik Berbasis Web," *Jurnal Ilmiah Ilmu Komputer*, vol. 8, no. 2, pp. 87–93, 2022, doi: 10.35329/jiik.v8i2.229.
- [15] S. S. Putro, E. Rahmanita, and F. Khumairoh, "Penerapan Metode SMART Untuk Seleksi Peserta Turnamen Pada Cabang Olahraga Bola Basket," *Jurnal Simantec*, vol. 7, no. 2, pp. 60–71, 2019, doi: 10.21107/simantec.v7i2.6691.
- [16] A. B. Marendra, D. Nugroho, and I. A. Prabowo, "Klasifikasi Pemain Futsal Menggunakan Metode Simple Multi Attribute Rating Technique (SMART)," *Jurnal Teknologi Informasi dan Komunikasi*, vol. 6, no. 2, Jan. 2019, doi: 10.30646/tikomsin.v6i2.377.
- [17] H. Sibyan, "Implementasi Metode SMART pada Sistem Pendukung Keputusan Penerima Beasiswa Sekolah," *Jurnal Penelitian dan Pengabdian Kepada Masyarakat UNSIQ*, vol. 7, no. 1, pp. 78–83, 2020, doi: 10.32699/ppkm.v7i1.1055.
- [18] F. C. Ningrum, S. Dandi, S. Aryanti, H. Angga Prasetya, and A. Saifudin, "Pengujian Black Box pada Aplikasi Perpustakaan Menggunakan Teknik Equivalence Partitions," *Jurnal Teknologi Sistem Informasi dan Aplikasi*, vol. 4, no. 4, pp. 125–130, 2020, doi: 10.32493/jtsi.v3i3.5343.
- [19] L. S. Sihombing, "Sistem Pendukung Keputusan Pemilihan Tim Futsal Sekolah Dengan Metode AHP," *Jurnal Informasi dan Teknologi Ilmiah*, vol. 8, no. 1, pp. 37–41, 2020.

- [20] Y. C. Giap, R. Krishna, and W. Purbaratri, "Sistem Pendukung Keputusan Penerimaan Pemain Futsal Dengan Menggunakan Metode TOPSIS (Studi Kasus: Tim Futsal Bhineka FC)," *Jurnal Teknologi Informasi dan Komunikasi*, vol. 1, no. 1, pp. 0–4, 2022.