Determine The Position of Basketball Players Using SMART (Simple Multi-Atribute Rating Technique) Method

by M Ali Syakur

Submission date: 08-Oct-2019 12:00PM (UTC+0700)
Submission ID: 1188409584
File name: eai.24-10-2018.2280567_Ali.pdf (911.93K)
Word count: 1877
Character count: 9688

Determine The Position of Basketball Players Using SMART (Simple Multi-Atribute Rating Technique) Method

Muhammad Ali Syakur[1], Sigit Susanto Putro [2], Achmad Roviqi[3], Achmad Jauhari[4], Devie Rosa Anamisa[5], Eka Malasari Rochman[6], Mula'ab [7]
{syakurali@yahoo.co.id[1], sigitida.06@gmail.com[2], achmadroviqi@yahoo.com[3]}

Informatic Engineering Courses, The Faculty of Engineering, Universitas trunojoyo Madura
Jalan Raya Telang, PO BOX 02 Kamal, Bangkalan – 69162[1234567]

Abstract. Basketball players usually have some playing position. A coach will determine the right position in the competition by looking the data of players. Therefore, with decision support system determine the position of the basketball player by coach is very helpful to achieve the maximum result in every competition. For building decision support system, selection position of the player comes from the player's data using the SMART method the purpose of providing recommendation to the coaches for the selection the each player's position, as well knowing the needs of the five player who matched is placed on the center position, point guard, Shooting guard, small forward and power forward. The result of SMART can be implemented in the election system player's position and has a 61% accuracy is obtained from the result of comparison between the result of the calculation system with the data of the coaches recommendation.

Keywords: basket ball, player position, SMART.

1 Introduction

Basketball is one exercise that is done for one's physical fitness. Many exercise can do it by someone with the abilities and their talents. One of Exercise in Indonesia is Basketball, this exercise have many fans from student in high school and collage. Basketball is exercise healthy body organs, entertaining and fun [1].

Basketball played by two team where each team has five core players with the goal of inserting the ball into the ring of opponent as much as possible, and block the opponent attack for that did not put the ball into the ring. While most replacement players are seven people, so each team consists of 12 people, such as Point Guard, small forward, center, big forward and, power forward [2]. To winning the competition, need a strong team. For building a strong team need a reliable players obtained by doing player's selection. The Selection of core player basketball in sports is very important for coach to bring the club to win.

Some basketball club in each year always receive registration new member who want to join the club. By looking the develop and high interest, so that make difficult for coach to determine the player's position. Because every each player has same skill.

ICCSET 2018, October 25-26, Kudus, Indonesia
Copyright © 2018 EAI
DOI 10.4108/eai.24-10-2018.2280567

Point guard player. Small forward, center, big forward, center, big forward, and power forward is a vital player, In basketball a lot of criteria that must be supplied so that a player can become a player basket from the body's endurance, posture, Shooting, Passing, Rebounding and Dribble. This player has the ability to manipulate the ball so good, good feeder and a good shooter. [2]

The purpose of this system was created to provide recommendations to the coach for a placement position of each player, as well as helping coach to know team player needs where a suitable position is placed on the center. This research using SMART method because SMART method is a method of settlement of multicriteria where in determining the position of the player's center many criteria to be considered. [3] the SMART Method is more suitable to use in this case study as compared to other methods, such as Profile Matching and AHP (Analytical Hierarchy Process). On the methods of profile matching mechanism in decision making by assuming that there is a level of an ideal predictor variables that must be met by the subjects examined, rather than the minimum levels that must be met or passed. [4]

The expected results in this study that is how accurate the utilization of SMART method taking into account criteria corresponding to a given player exercise trainer in an application decision support system determines the position of the player in the competition of basketball.

2 Method

2.1 SMART (*Simple Multi-Atribute Rating Technique*)

SMART using Adaptive linear model to predict the value of each alternative. SMART more used because of its simplicity in responding to the needs of decision makers and how to analyze the response. The best analysis is transparent so that this method gives an understanding of the high problems and be accepted by decision makers. Weighting on SMART using a scale of 0 to 1, so make easier the calculation and comparison of the values on each alternatives. [5] SMART Model used :

$$u(a_i) = \sum_{j=1}^{m} w_j u_i(a_i), \qquad i = 1, 2, \ldots m \tag{1}$$

Description :

w_j = weight value of the j criteria and the k criteria

$u(a_i)$ = value of $_{\text{utility}}$ the i criteria for the i criteria

SMART has some advantages compared to other decision-making methods, namely :

1. May perform addition/subtraction On alternative methods of SMART addition or alternative reduction will not affect the calculation of weighting because each assessment alternative are not mutually dependent.
2. The calculation method on SMART more simple so is not need a complicated mathematical calculations with a strong mathematical understanding.

3. Process in analyzing alternatives and criteria in SMART can be seen by the user so the user can understand how certain alternatives to choose from. The reasons how it selected alternatives can be seen from the procedures performed in a SMART beginning from the determination of the criteria, weighting, and the giving of value on any alternative.
4. The Weighting used in the SMART method there are 3 types namely direct weighting, swing weighting, weighting centroid. [6]

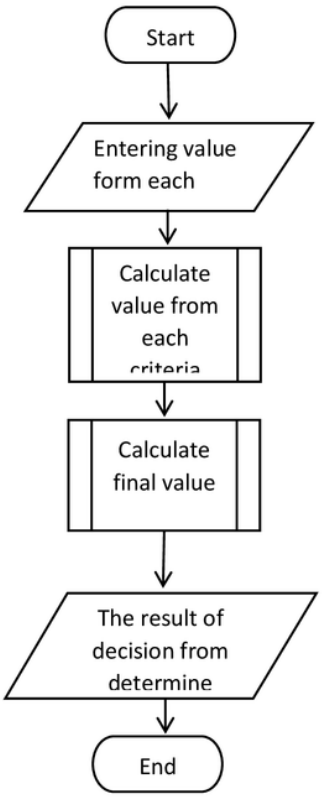

Fig. 1. flowchart SMART method.

The figure 1 is a SMART method of system flowchart describes the flow calculation of weighting :

1. Enter the criteria value of each alternative and that the data stored directly into the database. In this process the values inputted values are not real but the result of the train will be converted to numbers in the process in the system.

2. Next process i.e. calculating utility, final value and the results of the selection decision. The process directly into a process which will be processed in the system.

2.2 Basketball

The Player position on basketball sports is not just any player, a basketball player at this position the player must meet the criteria and requirements as follows:

1. Durability of the body
2. Posture
3. Shooting
4. Passing
5. Dribble

2.3 Decision support system

Decision support system is a computer-based information systems combines the models and data to provide support to decision makers in solving problems of semi structured or dependency problem that involves the user in depth. [7] the purpose of the decision support system are: help managers in decision-making on issues of semi structured. Provide support for the consideration of the Manager and not intended to replace the function of the Manager. Increase the effectiveness of the decisions taken the Manager over on the efficiency improvements. Speed of computation. The computer allows the decision makers to do a lot of computing rapidly and low costs .

3 Result and Discussion

3.1 Implementation

This section will describe the interface of a system that has been developed which includes the following pages:

1) Management Page Criteria

Fig. 2. Management Page Criteria.

On this page an admin user can make changes to the weighting of the criteria. In addition the user admin can also make changes to the weighting of sub criteria.

2) The Player test Page

Fig. 3. The Player test Page.

On this page coach users can adding the value of the players, change the value of a player, and remove the value of players. In addition the coach can see the values per period and the results of the average value of all periods.

Test scenario system. This system analysis using the data of the test results obtained in practice basketball club. Data will be compared with the data that is referenced by the coach. The percentage of data comparison is the accuracy of this system.

a) Test the functionality of the system
The functional test is carried out with the aim to find out whether the translator into a conceptual decision support system has been done properly or not.

b) Accuracy Test System with the recommendation of Coach
Analysis of this system is the result of a test exercise results data that will be used by coach to determine the position of player Center, Point Guard, Shooting Guard, Small Forward, and Power Forward. The data used as many as 18 players and 23 data training divided into 5 criteria.

Table 1. Comparison of the accuracy of the system with the recommendation of Coach.

Name	Coach	System	Testing
ADRIAN ISMI FEBRIANTO	SHOOTING GUARD	POINT GUARD	NOT MATCH
UMAR ZAMZAMI	POWER FORWARD	POWER FORWARD	MATCH
MAKSUM ALQORNI	SMALL FORWARD	SMALL FORWARD	MATCH
FARHIS ANGGARA	POINT GUARD	POINT GUARD	MATCH
DONI RAFIKA	CENTER	CENTER	MATCH

Name	Coach	System	Testing
KRISNANDA AHADIAN	POINT GUARD	POINT GUARD	MATCH
GATAN PRASETYO	SHOOTING GUARD	POINT GUARD	NOT MATCH
MOHAMMAD EFENDI	SHOOTING GUARD	POINT GUARD	NOT MATCH
ALFIN ALFARIS	POINT GUARD	POINT GUARD	MATCH
ADIE BAGUS SATRIO	SHOOTING GUARD	SHOOTING GUARD	MATCH
ABIE BAGUS SATRIO	POINT GUARD	POINT GUARD	MATCH
NURUT TAXIS	CENTER	CENTER	MATCH
ACHMAD FARIS	SMALL FRWARD	POINT GUARD	NOT MATCH
BADRIL RIZA	POINT GUARD	POINT GUARD	MATCH
MOH AS'AD	SHOOTING GUARD	POINT GUARD	NOT MATCH
HAFID HARIYADI	POINT GUARD	POINT GUARD	MATCH
MOH NABIL ROHMAN	SMALL FRWARD	POINT GUARD	NOT MATCH
ROMANSA SEPTA BINTANG	SMALL FRWARD	POINT GUARD	NOT MATCH

Based on the election and the perception of a coach as many as 18 players, coaches chose 11 players that match with the system. This is because a coach based on qualitative consideration of the experience of the coach to choose players. While the system of selecting based on qualitative methods by using rank techniques of SMART (Simple Multi Attribute Rating Technique) which produced the recommendation system accuracy of 11/18 x 100% = 61%

4 Conclusion

The end result of comparison of the recommendation system with recommendations from coaches approached the same relative, so that can be seen by as many as 11 players that data is suitable with the recommendation of coach of the 18 players who tested, then the value of the accuracy of the system is 61%.

References

[1] D. W. Prasetyo, *Basic Skill Level of Playing Basketball Students Follower Extracurricular in SMPN 3 Pandak*. Yogyakarta, 2013.

[2] B. Aryanto, *Characteristics of Basketball Players*. J. Dahlia, 2012.

[3] M. G. G. Valiris, P. Chytas, "Making decisions using the Balanced Scorecard and the Simple Multi-Attribute Rating Technique," *Perform. Meas. Metrics*, vol. 6, pp. 159–171, 2005.

[4] B. W. Sari, "Comparison of Profile Matching Method and Simple Additive Weigting on Determination of The students Grade X SMAN 2 Ngaglik," *J. Ilm. DASI*, vol. 16, p. 7, 2015.

[5] R. Yunitarini, *Decision Support System for Selection of Best Radio Broadcasters*. 2013.

[6] D. Kosasih, *Fundamental Basketball First Step to Win*. 2008.

[7] F. H. H. Risa, "Application of SAW and Fuzzy Methods In Decision Support System of Receipt of Scholarship in Decision Support System Scholarship," *Citec J*, vol. 3, pp. 89–101, 2016.

Determine The Position of Basketball Players Using SMART (Simple Multi-Atribute Rating Technique) Method

ORIGINALITY REPORT

8%	5%	6%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

MATCH ALL SOURCES (ONLY SELECTED SOURCE PRINTED)

2%

★ E S Soegoto, D Y Panggabean. "Building Futsal Competition System Based on Website to Increase Participants and Profit", IOP Conference Series: Materials Science and Engineering, 2018

Publication

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		

Determine The Position of Basketball Players Using SMART (Simple Multi-Atribute Rating Technique) Method

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7