

Web Based Selection of Football Striker Using Weight Product Method

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Abstract. Striker is a front line position player that directly face to face with defender and responsible for scoring goals. A striker not only must be have a good shooting accuracy but also can create a shooting space, and purpose a goal. In choosing a striker, a football coach can not only depends on his observation, but also have to check the data records to support the decision, therefore decision support system is needed to solve this problem. This system is web based application system using WP (Weight Product) method to provide recommendation for coach in choosing position for each players, and which one is the best for striker's position. From the result, WP shows an accuracy rate of 55% based on comparison between calculation system results and coach data recommendation.

Keywords: web based application, weight product, football striker selection.

1 Introduction

Football is one of the most worlds popular sports. Football is playing by two teams where each teams have eleven players or known as starting eleven [1]. Football is about how to scoring many goal to the opponent's goal and keeping own goal not to conceded [2]. The eleven players has each own positions and jobs to keep a teamwork well-balance that is Defender, Midfielder, Forward [3]. At the same time, each players have to opens up an opportunities to get a goal and keeping their own goalpost not to concede depends on condition and situation. The player that have to scoring goal is a striker. Striker is front line player whose directly face to face with defender [3]. A striker need some skills such as good shooting accuracy, speed, heading, dribbling, and passing to past through defender and scoring a goal for team. There are 3 striker positions often use in modern football such as Center Forward, Wing Forward, and Second Striker/Trequartista. Every practice has its own purpose where one of them is choosing a position for each players [4]. A common problem in football team is unspecific player position that have a major impact on teamwork. Every players has a preferred position but sometimes the position is not the best position based each their ability observation. All the time, coach decide player position based on coach observation, without significant data recorded that can supported the decision. Therefore decision support system is needed to solve this problem. The purpose of this research is to give recommendation for coach to decide position placement for every players, and help coach to know what the team need and which player whose suitable. This research used Weight Product method because it is one of multicriteria methods that suitable to decide striker position, which is multicriteria should be considered. Calculation in

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WP method does not need normalization, so the time required is also faster than SAW method [5]. This system is not replace coach function to make decision but help the coach in make decision faster and correct, according to criteria required or at least, close to it.

2 Methodology

2.1 Weight Product

Weight Product method is a decision support method by multiplying to connect rating attribute, where every rating attribute must be raised first with the weight of concerned attribute. WP method is one of the proposed settlement methods for resolving Multi Attribut Decision Making (MADM) problem, it means a decision making to establish the best from alternatives based on certain criteria[6].

The data used is from EL FAZA Surabaya Football School. The selection of new positions is done according to criteria required used in EL FAZA Surabaya Football School, such as First Touch, Heading, Dribble, Passing, Shooting, Acceleration, Tackling, Intercept. These criteria have been discussed with coach of EL FAZA Surabaya Football School. Thus criteria are used as guidelines to determine new positions.

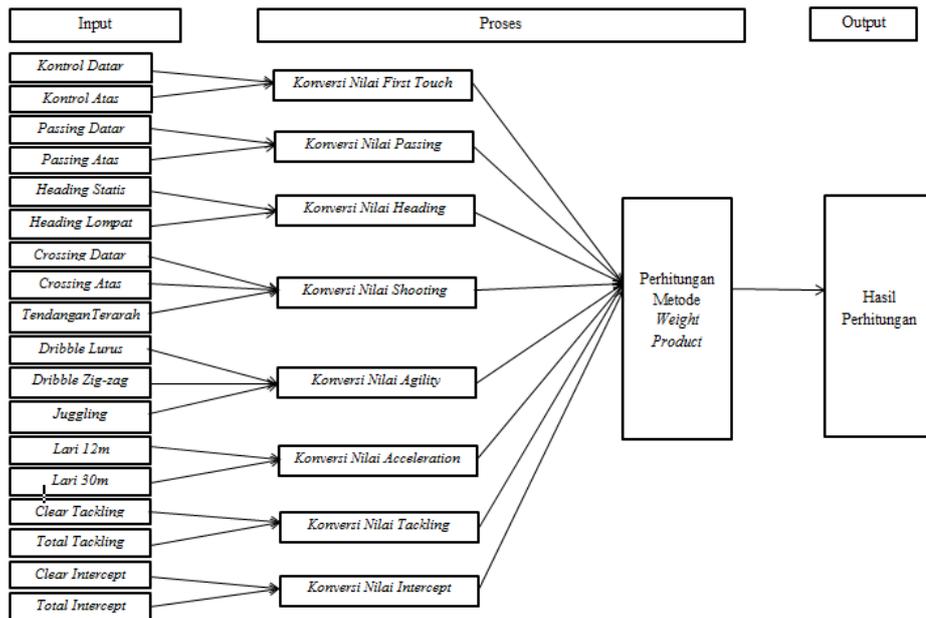


Fig. 1. General Sytem Analysis.

Figure 1 explain about general analysis within system, the following details are:

1. Input process is done by input each player criteria earned by performing tests and experiments
2. Determine the criteria of subcriteria value
3. Calculation process using WP from predetermined criteria to evaluate player's value
4. Output process display results obtained in calculation of ranking process and also the placement of ideal position

The WP method is a finite set of decision alternatives described in terms of some decision criteria. So this method does not need to be normalized [7]. Weighting is calculated based on importance level, which importance of WP method are [8] :

1. Very unimportant
2. Unimportant
3. Quite important
4. Important
5. Very important

$$\sum^w = 1 \text{ where : } W_j = \frac{W_j}{\sum W_j} \quad (1)$$

$$S_i = \prod_{j=1}^n X_{ij}^{w_j}, \text{ with } i = 1, 2, \dots, m \quad (2)$$

Where :

S = stated alternative prefraction is analogous to vector S.

X = states the criteria value

W = states the weight value

i = declare an alternative

j = states the criteria

n = states the number of criteria $\sum w_j = 1$.

$\prod_{j=1}^n X_{ij}^{w_j}$, = Multiplication of alternative ratings per attribute of $j = 1 - n$

W_j = is a positive-valued rank for a profit attribute and a negative value for the cost attribute.

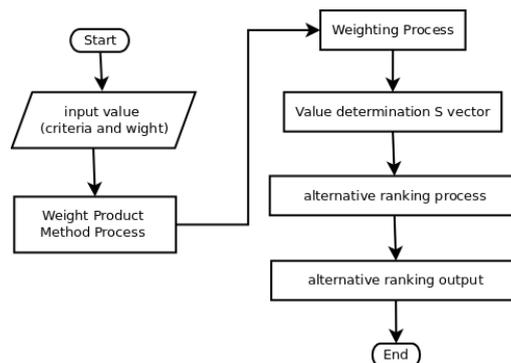


Fig. 2. Flowchart WP.

The relative preferences of each alternative are given in Formula 3 :

$$V_i = \frac{\prod_{j=1}^n X_{ij}^{w_j}}{\prod_{j=1}^n (X_j^*)^{w_j}}, \text{ with } i = 1, 2, \dots, m \quad (3)$$

Where :

S = stated alternative preference is analogous to vector S.

X = states the criteria value.

W = states the weight value.

i = declare an alternative.

j = states the criteria.

n = states the number of criteria.

* states the number of criteria that have been assessed in the vector S.

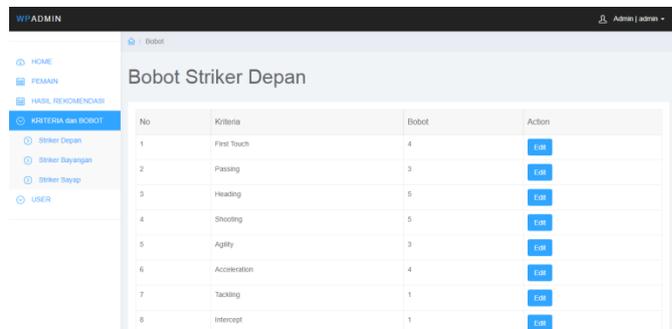
$\prod_{j=1}^n X_{ij}^{w_j}$ = multiplication alternative rank each attribut.

$\prod_{j=1}^n (X_j^*)^{w_j}$ = addition multiplication alternative rank each attribut [9].

3 Result and Discussion

3.1 Result

The implementation on decision support system within single player, multiple and mixed has been made in accordance with the design. Here the interface of system that has been discussed previously :



No	Kriteria	Bobot	Action
1	First Touch	4	Edit
2	Passing	3	Edit
3	Heading	5	Edit
4	Shooting	5	Edit
5	Agility	3	Edit
6	Acceleration	4	Edit
7	Tackling	1	Edit
8	Intercept	1	Edit

Fig 3. Page Managing Criteria and Weights.

In Figure 3, user not only can see the weight of criteria but also can make changes. In Figure 4 user can view player's ranking based on the WP method.

No	Pemain	Hasil Striker Depan	Hasil Striker Bayangan	Hasil Striker Sayap	Rekomendasi
1	Azmi Ananda	0.056540358456507	0.056679423534607	0.056209067711584	Striker Bayangan
2	Andi Ferdian	0.057816783861149	0.05623655738327	0.057322978962088	Striker Depan
3	M. Fauzan	0.056661203465231	0.057114369941668	0.05626436827012	Striker Bayangan
4	Kaeli M. Santos	0.05595123903898	0.057074844995071	0.056302869466982	Striker Bayangan
5	Lukas Andrianyah	0.05323226342701	0.053682146020499	0.053831143694551	Striker Sayap
6	Alfan Qiom	0.054470887682117	0.054235733265848	0.053586241221036	Striker Depan
7	David Setiawan	0.054946714903866	0.055267549032013	0.054821151673632	Striker Bayangan
8	Robby Andrianyah	0.055807773355186	0.048423067189675	0.048063195740277	Striker Depan
9	Novian Awan D.	0.056789601286999	0.05588856612679	0.057504688797276	Striker Sayap
10	Komona Fajar	0.055800182778076	0.054868404403391	0.056290968889283	Striker Sayap

Fig 4. Players Page with Weight Product Method.

3.2 Discussion

The analysis of this system using experimental training results data obtained at EL FAZA Surabaya Football School. The data taken compared to coach data observation.

3.2.1 System Functionality Testing

This functional test is conducted in order to know whether implementation of conceptual translator into a decision support system of player positioning has been done correctly or not.

Table 1. System Functionality Test.

Description	Testing procedures	Input	Output
Login to system	Admin and coach input the username and password then push <i>login</i> button	Username and password correct	Sign in on main page according to privilege respectively
		Username and password correct	Will issue username or password wrong
		Username and password incorrect	Will issue username or password wrong
Entry / update master data	The user selects the entry menu or updates the master data	Username and password incorrect	Will issue username or password wrong
		Entry data is completely filled in accordance with the form provided the contents of the form update the correct data	The data will be stored, and will be displayed by the system data in the table will change as has been edited
		Select the menu data to be displayed	Data will be displayed
Description	Testing procedures	Input	Output

3.2.2 Test System Accuracy with Trainer Recommendations

The data used are 18 data players and 5 exercise data that divided into 8 criteria. The system calculating value for each player, which are each position of the front striker, shadow striker, and wing striker. Table 2 show comparison between data system and coach observation, the accuration value of $10/18 \times 100\% = 55\%$.

Table 2. Comparison of Systems with Coach Recommendations.

Name	Coach	System	Tesing
Azrul Ananda	Defender	Shadow Striker	Unsuitable
Ardi Ferdian	Striker	Forward Striker	Suitable
Alfan Qirom	Midfielder	Forward Striker	Unsuitable
David Setiawan	Defender	Shadow Striker	Unsuitable
Kelvin Ardiansyah	Midfielder	Wings Striker	Suitable
Billy Andri	Midfielder	Shadow Striker	Unsuitable
Lukas Ardiansyah	Midfielder	Shadow Striker	Unsuitable
Naufal Zidane	Midfielder	Shadow Striker	Suitable
Ilham Zaenal A.	Midfielder	Shadow Striker	Suitable
Yoga Endik	Midfielder	Shadow Striker	Suitable
Fery Widyatana	Defender	Forward Striker	Unsuitable
Rifqy Ardiansyah	Striker	Forward Striker	Suitable
Moch. Sofyan	Midfielder	Shadow Striker	Unsuitable
Novan Awan D	Striker	Shadow Striker	Suitable
Kresna Fajar	Striker	Shadow Striker	Suitable
M. Fauzan	Defender	Shadow Striker	Suitable
Kael M. Santos	Midfielder	Shadow Striker	Suitable
Febri Yuri Perka	Defender	Shadow Striker	Unsuitable

4 Conclusion

The final result of comparison system with coach recommendation is quite good. It can be seen with 18 data players, from the data system can only produce 10 players who fit the front striker position, shadow striker and winger striker. The system accuracy is 55%, while the accuracy value is obtained from comparison of system results and coach recommendation.

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