

## **TOPSIS METHOD ON PLAYER SELECTION IN MBA**

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### **ABSTRACT**

*This work has tried to yield a result on basketball player selection by using Multiple Criteria Decision-Making (MCDM) method. Player selection has always been one of the most critical subjects for the clubs from all over the world. There are many criteria effecting the selection of players, like the position of players, their attributes, salaries, etc. and generally all of these attributions are evaluated carefully to transfer the right players to the clubs. For presenting a scientific approach to this subject, MDCM, sports and transfers have been related and some of the well-known method TOPSIS have been used to clarify a problem about selecting one of the six NBA players.*

**Keywords:** MCDM, TOPSIS, Player Selection

### **1. INTRODUCTION**

In this project, the MCDM method TOPSIS are applied to a specific problem for presenting how to reach a final decision. The problem is about a basketball player selection process, which includes many different attributes, and how the decision making methods can be useful for obtaining the best alternative possible. All of the managers have to make critical decisions on materials, equipment, resources, staff, any other crucial criteria to create a successful job environment, to gain in higher performance or to sustain quality [1,2,3]. Sports managers focus almost on the same points to be successful. They make efforts to create a good team, but first step of creating a successful team is selecting the right and appropriate elements. In other words, player selection has a great effect on the first stepping stone to the success.

For applying the MCDM method to the case, it's assumed that the 31st team will join to the National Basketball Association of the United States (NBA) and this imaginary team has decided to transfer a center player to the squad. As an introduction to the selection process, some players are shortlisted and they are evaluated to find the most appropriate one.

Before going into the details, some points should be clarified to display all the criteria and their necessities for selecting a new player to the imaginary new team of NBA. As it can be easily expected, there are many important criteria affecting the decision on a player selection. For this case, it's assumed that, the head coach of the team has requested to the scouts to find a player who can dominate the play by getting both offensive and defensive rebounds, which points out a player with adequate rebound averages. The other attribute is, points per game. In modern basketball, especially at the most successful organization of the sports world like NBA, a center player can't be selected just according to a good rebound statistics, but he also has to make great contributions to the score. This makes it necessary for the scouts to find scorer centers.

The center of the new imaginary team has to be a defensive threat on the court. It is known that players playing as a center has to be effective at blocking. Opposition guards and forwards should not be allowed to penetrate to find easy baskets and centers should use their physical advantages to obstruct the opposition players. That is why the manager and scouts of the new NBA team seek for players with satisfactory block per game statistics.

Making assists is not seen as compulsory task for centers but receiving assists from centers has started to be a good way of opening the game and creating more chances to the players of other positions. Sometimes, coaches find it difficult to defense the opposition centers when they are so close to the basket and they assign extra help to the opposition centers in such conditions. The centers' ability to assist increases extra points and decrease the number of turnovers and inconclusive attacks. That is why the coach takes assisting ability into consideration in this case and adds it to the list as an attribute to notice.

Age is another important criterion for selecting the basketball player. Managers and coaches are more likely to form teams with younger players if they plan future success and if they want to force the physical limits of their players. Thus, age criterion is also taken into consideration in this player selection case.

The last criterion for this selection problem is salary. As it's stated earlier, this imaginary team is going to be the new entrant to the NBA and they are going to start from a scratch. The system of NBA for new entrants is very complicated, but in this case, it's assumed that, the manager and coach have to build the team and transfer all the necessary parts considering the budget factor. Player salaries can never be ignored like all the monetary affairs and they are evaluated with the other player attributes for finding out the ideal basketball player selection.

On the other hand, some criteria are ignored and are not included as a part of the main evaluation. For example, steals per game statistics are so close for most of the centers and players of that position can barely make differences with respect to others. Height is also one of the ignored criteria for the selected players that are stated below. Height of the players were checked and it was seen that the difference between the tallest and shortest player that could be evaluated with MCDM method was only 3 centimeters, which can be ignored because of offering only extremely slight advantages to the players. Finally, just to remind that, minutes per game (MPG) stats are not included as a part of evaluation, however the MPG stats for the shortlisted players are between 24.5 and 27.5 minutes, which makes it ignorable to see as another important criterion. Because it is almost impossible to change the stats drastically in only 3 minutes.

Table 1 shows the players to be evaluated, their statistics, ages and salaries. The selection of the center to be transferred is made between Kendrick Perkins of the Boston Celtics, Andris Biedrins of the Golden State Warriors, Samuel Dalembert of the Philadelphia 76'ers, Josh Boone of the New Jersey Nets, Joel Przybilla of the Portland Trailblazers and Brendan Haywood of the Washington Wizards.

*Table 1. Players and their stats*

NAME	RPG	PPG	BPG	APG	Age	Salary
Kendrick Perkins	6,9	6,1	1,5	1,1	24	4,1
Andris Biedrins	9,8	10,5	1,2	1	22	3,6
Samuel Dalembert	10,4	10,5	2	0,5	27	10,6
Josh Boone	7,3	8,2	0,9	0,8	24	1,2
Joel Przybilla	8,4	4,8	1,2	0,4	29	6,3
Brendan Haywood	7,2	10,6	1,7	0,9	29	5,5

In Table 1, RPG stands for rebounds per game, PPG for points per game, BPG for blocks per game and APG for assists per game. Player salaries are in million dollars and they are all given per year. As it can be seen, there are six alternatives but only one of them have to be the player to be transferred.

Some important points have to be reminded again before going through the calculations and selection. These are the real regular NBA season statistics of the players, which have been obtained in season 2007-2008. Assuming that the imaginary new NBA team is going to enter the league in season 2008-2009, the player salaries are listed according to their contract values of the next season.

The criteria are ranked below according to the importance in the concept of current player selection problem:

Rebounds per game (RPG); Points per game (PPG); Blocks per game (BPG); Age; Player Salary; Assists per game (APG).

RPG, PPG, BPG, APG are benefit attributes. Player salary is a definite cost attribute, whereas the criterion of age is also seen in the same class as player salary, because the younger the player the more preferable he is.

## 2. PROBLEM SOLUTION

TOPSIS have used to find the solution. Calculating the proximity to ideal solution is the last step of TOPSIS [1]. Because values can give us the possibility to rank the alternatives and find the best one among them. The decision-maker can get Table 2 below:

*Table 2. Proximity to ideal*

Player	C*
Kendrick Perkins	0,4675
Andris Biedrins	0,8250
Samuel Dalembert	0,5283
Josh Boone	0,5536
Joel Przybilla	0,2881
Brendan Haywood	0,5589

TOPSIS method states that, the alternative with the highest value of C\* is the most preferable one. According the results of this problem, Andris Biedrins, the center of the Golden State Warriors, should be the first player to be transferred by far. Andris Biedrins is followed by Brendan Haywood, Josh Boone, Samuel Dalembert, Kendrick Perkins and Joel Przybilla, respectively.

## 3. CONCLUSION

TOPSIS, gives the decision-maker the opportunity to assign weight vectors, which are found out by using AHP method, to each attribute of six alternatives. Some simple steps lead the decision-maker to get an accurate ranking of alternatives. As in Table 2, the player alternatives are ranked according to their proximities to the ideal solution. TOPSIS is more likely to serve to the subjective selection cases. Because of the possibility created by the subjective approach enabling and featuring structure of TOPSIS, the top alternative is believed to be the most dependable one. The final ranking reflect the results of weight values determined by the decision-maker. Topsis emphasizes on all the attributes, doesn't mislead the decision-maker and in this player selection problem, it doesn't give more than one players to be transferred to the team. Decision-maker has only one result.

In conclusion, even though the other methods present many different names, TOPSIS method should be the first method to be taken into consideration and Andris Biedrins, the Latvian player of the Golden State Warriors should be transferred to the team as the new center.

#### **4. REFERENCES**

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