RESEARCH INVENTY: International Journal of Engineering and Science
ISSN: 2278-4721, Vol. 1, Issue 3 (Sept 2012), PP 05-07
www.researchinventy.com

Data Mining System for Selection of Best Basket Ball Team

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Abstract: *Selection of a team for any game is a difficult task. It is totally governed by the selection committee members, which may be bias and therefore appropriate team is not selected. This may cause the failure in the National & International level competitions. In the current scenario there is no scientific method available and used for the team selection.*

In this research paper, Data Mining techniques are suggested to design & develop a software tool for the selection of a team for a sport/game especially for Basketball.

Keywords: *Sports Science, Sports Skill Tests, Basketball, Data mining, Classification, K- Nearest Neighbor.*

I. Introduction:

Sport is a physical activity that is fair, competitive, non deviant, and that is guided by rules, organization, and/or tradition. Selection of a team for any game is a difficult task. In the current scenario there is no scientific method available and used for team selection.

The performances of our National teams in International competitions have become a matter of worry. The Government is now looking at it with the serious concern. That performances have been disheartening cannot be denied.

Mostly, a team is selected depending upon the past performance of the players and the impact of players on selection committee members. The team selection is influenced by the territory problems, political interference and the other antisocial factors. Selection of team is governed by the selection committee which may be bias and therefore selection of team is not done appropriately. This may affect the effectiveness of selection criteria for team members, which may directly result on the performance of a team. As a result there is a great failure of country in the national and international level competitions.

Our society is collecting a tremendous amount of data and statistics about games, players and athletes. From hockey scores, basketball passes and car-racing lapses, to swimming timings, boxer's pushes and chess positions, all the data is stored. Commentators and journalists are using this information for reporting, but trainers and athletes would want to exploit this data to improve performance and better understand opponents. [1]

Yet there is no scientific method available and adopted for the team selection. Therefore it becomes necessary to provide a scientific approach to record the skills of a (Basketball) player.

There is no scientifically proven appropriate method available for team selection. In this research paper, a methodology is suggested which uses the DM techniques in collaboration with the sports skill test developed by the researchers in sports and physical education for selection of a team for sports game especially the Basket-Ball.

The testing of physical fitness enables the tester to select the potential probable for specific professions or sports categories at a young age so as to give advanced professional training to the promising individuals having higher pre-training basic level of physical fitness for the sport for which the selection is being made.

Data mining is a tool that can extract predictive information from large quantities of data, and is data driven. It uses mathematical and statistical calculations to uncover trends and correlations among the large quantities of data stored in a database. Data mining uses many statistical functions such as standard deviation, regression analysis, and variance which are valuable tools that allow people to study the reliability and relationships between data. Much of what data mining does is rooted in statistics, making it one of the cornerstones of data mining technology.

In this research work it is proposed to design a system to suggest a method for selection of a better Basketball team. Data Mining tools will be used to determine the best selection of players to form a better Basketball team.

Literature Survey:

The selection of teams for different sports competitions is based on the measurement of sports skill with the help of quite objective and scientific means. [1] From last 60 years the science of sport skill test is evolved. Skill tests have many important functions. They may be used for selection, evaluating training effects, prediction, comparative evaluation and motivation. The sports skill testing is comprised of more complex, coordinated and specialized abilities involved in particular sports such as basketball, Volleyball, badminton, soccer, handball, gymnastics, track & field. [1]

Sports Authority of India (SAI) is using its own standards in Sports Talent Content Scheme for spotting and nurturing of basketball talent in young boys and girls. The basic objectives of all SAI skill tests prescribed for ten Olympic disciplines (athletics, badminton, basketball, gymnastics, hockey, swimming, table-tennis, football, volleyball and wrestling) are to start a movement in India to broad base sports at grass root level and to scout the talent among school boys and girls who are genetically gifted and are endowed with natural motor qualities and suitable physical growth potentials. [1]

Various factors come into play while selecting a team. A human selection committee will invariably suffer from the shortcomings of unfair or biased judgment, human error, and overlooking of certain important points. A system is thus required which can effectively take into account all factors involved and give the optimal team, with out human interference. [2]

Data Mining is often finding hidden information in the database. It has two main models i.e. Predictive and Descriptive. The various tasks under Predictive model are Classification, Regression, Time series analysis and Prediction. The Descriptive model consists of tasks like Clustering, Summarization, Association rules and Sequence discovery. Classification maps data into predefined groups or classes. It is often referred to as supervised learning as the classes are determined before examining the data. Classification algorithms require that the classes be defined based on data attribute values. They often describe classes by looking at the characteristics of data already known to belong to the classes. [3]

Proposed System:

The system can be developed for University Basket Ball team selection. The standard scores of best performers in Inter-Collegiate Basketball competitions and Basketball trials will be searched. These scores can be used as a standard to select the players to form a better team.

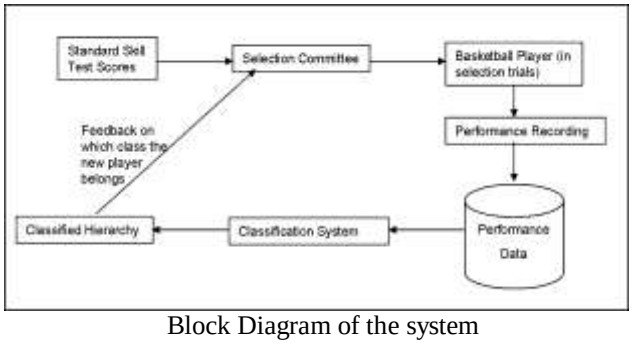
Sports skill tests (Test Battery) developed by the researchers in sports and physical education for selection of a team for a particular sports/game especially for the Basket-Ball, can be applied on the number of players each time. The data can be collected or obtained from the standard skill test scores previously taken. K-Nearest Neighbor, technique of Data Mining can be applied on the obtained skill test result to get best players among all the players who will match or are nearest to the standard scores.

KNN technique assumes that the entire training set includes not only the data in the set but also the desired classification for each player. Thus the training data becomes model for selection. When classification is to be made for new player, its distance to each player in training set is to be determined. Only the K closest entries in the training set are taken into consideration for further process. The new player is then placed in the class that contains most players from the set of K closest players.

Thus best performing players can be selected to form a better team. Thus we can have a better Basket ball team which satisfies the standard skills for competitions.

A scientific training tool can be made available for the selection committee, which can be used for selection of team member upon the performance.

This will come out with 12 best performing players, whose scores are closer to the standard score. Thus we can have a better Basket ball team which satisfies the standard skills for competitions.



Block Diagram of the system

Methodology:

The system will be developed for University Basket Ball team selection. The standard scores of best performers in Basketball will be searched, which will be used as a standard to select the players to form a better team. These scores will be used to get best players among the players who will matches or nearest to the standard scores.

Sports skill tests (Test Battery) developed by the researchers in sports and physical education for selection of a team for a particular sports/game especially for the Basket-Ball, will be applied on the players each time, appearing for University Basket Ball team selection, the data will be obtained from the standard skill test scores.

A tool will be developed for the research purpose. A real data will be analyzed using this tool and will be compared with the standard reports for its efficiency. A scientific training tool will be made available for the selection committee, which can be used for selection of team member upon his performance.

Data mining started with statistics. Statistical functions such as standard deviation, regression analysis, and variance are all valuable tools that allow people to study the reliability and relationships between data.

Our society is collecting a tremendous amount of data and statistics about games. Players and athletes would want to exploit this data to study & improve their performance and better understand opponents. Data mining technology allows using the mass quantities of data that it has compiled and developing correlations and relationships among the standard set of data and test scores to select proper players to improve performance of a Team.

The tool will be using Data Mining technique K-Nearest Neighbor which will be applied on the obtained skill test result. This will come out with 12 best performing players, whose scores are closer to the standard score. Thus we can have a better Basket ball team which satisfies the standard skills for competitions.

All the test scores or results of all players will be recorded. Data mining technique i.e. K-Nearest Neighbour will be applied on these results and the obtained scores will be matched with the standard scores to get the nearest best score making players to form a team.

Expected Results:

All the test scores or results of all players will be recorded. Data mining technique i.e. K-Nearest Neighbour will be applied on these results and the obtained scores will be matched with the standard scores to get the nearest best score making players to form a team.

Conclusion:

The investigator will analyze the data collected during the studies, analyze and make the implications using the tools developed in the design process. A better selection tool to select the better player suggested.

Selection test scores and will be monitored and by applying the Data Mining technology a list of 12 players will be suggested, which will form better Basket ball team.

Limitations:

This research work is limited for Basket ball only. The delimitations of this tool are that selection of a better Basket ball team will be studied and other sports are not included.

The latest standard scores may not be available always. This may affect the outcome to be analyzed. The players appearing for University selection process are only considered.

The other limitation of this research is it is mainly concentrating on the selection of players who are performing best and not on improving the performance of the players. Training plans can be considered for improving the performance but there may be other factors also like diet, psychology, etc that are not included in present study.

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