Amalgamation of Data Analytics & Sports

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Abstract:
Today’s world is driven by electronic data & the amount of this data is massive & growing rapidly. Management of this enormous data can be done with the help of big data & analytics technology. Big data and Analytics are capable to drive the next evolutionary phase of sports& games. Team sponsors, coaches, managers & team players now perceiving the requirement of performance tracking for study so they can take corrective measures to improve players & team's performances. As a consequence, sponsors & team managements are competing to secure a competitive edge against the peers in the arena of play. This requirement produces the need of data analytics in sports& games.

Keywords: Applications of Big Data, Data Analytics, Physical Education, Sport & Games.

I. INTRODUCTION

Before digital data like statistical reports, images, position charts, graphs & videos introduced in sports tournaments & practice sessions, coaches& trainers uses statistical sheets for who played, who scored and who didn’t. Based on this reports players on any particular sport were evaluated. Decisions about who to play, draft, coach or develop were being made with a gut feeling or adhering to previous performance. Data analytics today used in developed competitive sports world for collection of apposite, historical, statistics that when properly applied can provide a competitive advantage to a team or individual sports players. Through the collection and analysis of these data, sports analytics inform players, coaches, sponsors other staff in order to facilitate decision making both during and prior to tournaments and matches [1]. Adding revolutionary machines, devices, algorithms & software for manipulating data can provide forecast of a future sporting event. Before a tournament is even happened, it comes up with the most likely results based on numbers; as opposed to a gut feeling. Data analytics being relatively common in the many modern sports &amp;amplitude of statistical data that have become crucial in the analysis of the game.

II. WHY DO DATA ANALYTICS NEED IN SPORTS?

Sports analytics is a huge field & combination of new age of experts who provides solutions to a wide range of users. There are three main factors that define a sports analytics solution:
I. For what sports solution needed? For e.g. Badminton, Cricket, Soccer, Tennis etc.
II. What is the need of solution? For e.g. performance improvement of players, virtual viewer experience, etc.
III. Who are the users? For e.g. players, coaches, managers, referees, sponsors, etc.

III. APPLICATIONS OF SPORTS ANALYTICS

Visual Data Intelligence: It is used to provide graphical reports of game by choosing from live and historical data and statistics, social media feeds, video and telemetry, all integrated into compelling graphics for display on video boards, scoreboards, and screens of all kinds.

Motion Detection for Accurate Decision: This application uses live game play record to find out precise result of event using graphical conversation of objects in motion. For e.g.: checking badminton serve of player using a motion analysis-based approach to recognize the basic player action in momentum of serve style[2].

Wearable Ubiquitous Devices: Wearable technology devices track player’s real-time biometrics during practices and games. A program uses GPS to track the field position of every player at every moment of a game. Wearable devices report in real time the heart rate of players & this data can help to gather other statistics about player’s physical conditions.

Live on the Field Data Collection: Currently, lots of data is collected manually during games and sports competitions. But much of the live data moves so fast that it's a moment lost in time. Using radio-frequency identification tags which is attached to equipment like balls, sticks, rackets and players to track movement, distance and speed.

Fan Preferences: This proprietary real-time player tracking solution enhances fan viewing through television broadcasts, mobile engagement and in-stadium, enabling fans to view never-before-seen real-time player data and compelling new performance insights.

Influence Coaching Decisions: It deliver the most important data to coaches for better results on the field.

IV. DATA ANALYTICS IN GAME PLANNING

Player & Team Selection: One of the most important

Running (Marathon): Running a marathon is hard, but the training can be even harder. Using wearable sensors decisions
taken by coach & manager in big sports teams is to find the most appropriate role and position for particular players for a match. Every single data gathered, from the player’s tactics, fitness routines & physical abilities helps coaches for decision making.

Real-time Game Strategy: Coaches and managers use technologies to track characteristic like a player’s physical endurance on the field in real time. This session’s data is used to alternate or advance how they sustain a player’s performance while player exhausted on field. During training session’s data about heart rate, acceleration, speed, distance and power used to measure player performance. This data helps coaches and managers to find outfit players and those who need a rest.

Revamp players on the Field of Play: Analytics helps coaches determine not only who the best players are, but even deeper the best combination of players. Coaches can also predict how the opposing team will respond to certain situations, which is bonus in game planning. For e.g. For example in NBA, data can help coaches to discover if the pass was perfect or the defense was weak. Results of play can be used to build game strategies. If the pass is good, it identifies players that work well together and use them for the same.

Injury avoidance: The protective equipment’s like - pads, helmets, shoes, gloves - has supported to additional safety in sports. But, players can still be vulnerable to injury. For e.g. in contact sports like boxing sensor fitted with mouth guard can measure when an impact of punch in pounds that is above the preset safety standards during play. This can helps coaches to remove out boxer from the ring and examine him for signs of serious head trauma.

Movement Prediction: Analyzing player’s behavior based on past game records and in real time game. It will help to predict how match will be played against certain competitors. Previous point table data & video recordings used to detect playing styles, & strategic patterns before matches ends.

V. USE OF DATA ANALYTICS IN DIFFERENT SPORTS

Tennis: an analysis is done based on a whopping millions data point collected from past matches, an equation results vital data points based on of serve percentage, points, serve speed, scores, winner, duration, player types, surface, etc.

Cricket: Prediction of Team performance in the live match based on historical data, current environmental data like bouncy pitch, moisture condition.

NBA: In NBA cameras installed in arenas to track the movements of every player during match& The data collected by the software provides statistics based on speed, distance, player separation and ball possession. attached in shorts & shoes an athlete can get data about speed, location, orientation, foot data, dehydration warning, calories burned, and heart rate. Etc. These sensors provide essential information which lets runners reach an edge over the competitive environment.

Ice Hockey: In Ice hockey data collected for from league, team-by-team, player-by-player, and can incorporate other ideas such as goal difference, time remaining, current form, history against opponent. Ice hockey is aggressive sport so data about collision of players with their opponents also gathered for injury& trauma identification in real-time match.

Skiing: In skiing data analytics used to predict future factors such as snow slides or snowfall.

Chess: it is a mathematical game where past games records like moves, strategies & player’s behavior in a particular situation used to develop plan & strategy against opponents for upcoming tournament.

Golf: Using big data3D images are created which provide great insight into where the golfer needs slight improvements to get more power and accuracy.

VI. ADVANTAGES OF SPORTS ANALYTICS

Accuracy: Tracking momentum of sports equipment or athlete during game or training sessions provide better clarity to referees for decision making

High Performance: Decisions involving player acquisition, fielding the best possible rotation on a given game, which areas the team must focus on to win games are a few of the processes analytics plays an important role in. Player Health & Injury

Probability Analysis: Prediction of the situations when players will be most prone to injuries, so that time off or alternatives can be arranged in advance, thereby intensify team effectiveness.

VII. CONCLUSION

Data analytics offers coaches, managers & players an extraordinary approach to make use of the information gained from the field and make detailed & precise decisions that can help teams not only trounce in game, but outmaneuver their opponents.

VIII. REFERENCES


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