IMPACT OF TECHNOLOGY ON CRICKET

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Abstract
Over the years cricket has incorporated into the game a few of the latest technological advances available. The purpose of the study was to highlight the technological advancement in cricket. Much advancement in cricket use are Speed gun, Decision review system, Hawkeye, Stump mic and camera, edge detection, Hotspot, LED stump and bails, Spider cam, Ball speed measurement, Supper shopper, Chips in bat etc. In the 21st century, the entire face of cricket has changed drastically with the use and advancement of modern technologies.
Keywords: Speed gun, Decision review system, Hawkeye, edge detection, Hotspot, LED stump and bails, Chips in bat, Drones, and sensor.

Introduction

Cricket is a sport which is played between two teams of eleven players each who score runs. This is done by hitting the ball across the boundary, or by running between two sets of three small, wooden posts called wickets. The field has an oval shape with a rectangular 22-yard-long pitch in the center. In the game process, one team bats and tries to score runs, the more, the better, while the second team fields and bowls, and attempts to dismiss the batsmen and limit runs received by the first team. The game started in England in the 16th century. The earliest definite reference to the sport is in a court case of 1598Then it was called cricket. Many facts make it clear that cricket was actively developing in the 17th century, and by its end, it became an organized activity that was played for high stakes. Cricket is one of the most popular games in India. The excitement of the game was there in listening to score updates on radio, but technology advancement made it possible to watch cricket on television. Technology has been utilized in sport for many years in various forms and play particularly vital role especially for the elite sport. Cave and Miller (2015) states that technology plays an increasing role in assisting professional athletes, amateur runners, and armchair fans to engage in the sport. Cricket, like many sports played these days, has integrated technology into its everyday lives. The technology advancement in sports seems never going to stop experimenting new concepts, so it's won't be wrong that in near future we can watch the technology enthralled action on the field which is quite remarkable both for players as well as we the viewers or audience. Cricket is arguably one of the most popular sports in the world that makes frequent use of technology during play. There is no other sport that has adopted technology in the way that cricket has. Technology helps the players to improve themselves as it helps them focus on the areas where they need to improve. It also helps the skippers in devising tactics. Technology has made life easier for the umpires to make an accurate decision. Let's look at the technological advancements in the cricket that has revolutionized the experience of the game.

Technological Advancements in the Cricket

Third Umpire

In international cricket, the third umpire has been used to supplement the role of the two umpires on the

ground. The third umpire is equally qualified and sits off the ground with access to TV replays of certain situations (such as disputed catches and boundaries) to advise the central umpires. Before 1992, all the decisions pertaining to what was happening on the field was decided by the two on-field umpires. The Third Umpire, also known as the TV Umpire, came into play in the first Test between India and South Africa in November 1992.

Speed Gun

It was only in 1999 when Cricket got introduced to the concept of Speed Gun which accurately measured the speed of the ball from one end of the pitch to the other. The device relays a beam from the radar head to detect movement across the pitch. It was only in 1999 when Cricket got introduced to the concept of Speed Gun which accurately measured the speed of the ball from one end of the pitch to the other. The device relays a beam from the radar head to detect movement across the pitch. A radio wave is reflected from the moving object which in this case is a cricket ball. This wave is detected by the gun which uses the principle of Doppler Shift to measure the speed that the ball is travelling when it is bowled.

Decision Review System (DRS)

Cricket has joined some other world sports and has included an umpire referral system in some international matches. Such a system was first trialed in 2008 (in a Test series between Sri Lanka and India). The Umpire Decision Review System (UDRS or DRS) is a technology-based system used in cricket to assist the match officials with their decision-making. On-field umpires may choose to consult with the third umpire (known as an Umpire Review), and players may request that the third umpire consider a decision of the on-field umpires (known as a Player Review). It all sounds great for the players and viewers at home, but the pressure is on the umpires. The process often takes too long and can distract from the game.

Ball Tracking System or Hawkeye

Hawkeye was invented in 2001 to show the trajectory of the ball once delivered from the bowlers' hand. This technology is vastly used in major outdoor sports. It uses cameras which are aligned under the stadium roofs and generates a three-dimensional representation of the trajectory of the ball. It is solely used to track the trajectory and is used in judging LBW decisions. While the ball-tracking technology supports numerous sports, Hawk-Eye's cricket technology has been used by host broadcasters at major Test, ODI and Twenty20 matches around the world. It was first used by Channel 4 during a Test match between England and Pakistan at Lord's Cricket Ground, in May 2001. In 2008, it was approved for use by the ICC and added as part of the Decision Review System. It is a commonly used and is an indispensable tool for cricket commentators around the world to confirm the umpire's decisions. It is used as part of the DRS for adjudicating LBW decisions.

Stump Mic and Camera

Attached to the stumps, the mic and camera gave the viewers an on-field experience, on how it feels to be in the center of the stadium. The Stump cameras are utilized to closely cover the game happening in the ground. Tiny yet quite advanced set of cameras are installed inside the stumps to provide a unique angle of coverage to the viewers, it is vertically aligned in the hollow middle stump through a small window on the side of the stump via a mirror. The mic is used to receive the sound waves and helps the umpire whilst taking decisions when the batsman nicks the ball. Much before stump cameras

came, stump mikes have been adding to the thrill of accessing the banter at the heart of all the action — the center of the field. They were introduced in the late 1970s by Kerry Packer, the owner of Channel 9 that covered cricket in Australia. Packer wanted fans to hear the game.

Edge detection

Often called snick meter, also known as "Snicko" in the cricket dialect and in its modern form as ultra-edge, the Snick-O-Meter was invented by Allan Placket to aid the umpires in detecting the edge and the preceding caught behind the wicket. This technology is used to tell whether the ball has touched the bat and route to the fielder. Invented in the mid-90s, Snicko produce a disturbance in the graph when the leather of the ball touches the bat or any other part of the batsman. The shape of the frequency helps the third umpire in making a conclusive decision. The technology uses a microphone, placed near the stumps, to detect the sound of the hit and determine the surface of the impact. It utilizes the variation of sound frequencies of the ball while hitting different surfaces. The frequency of the sound will be different if it hits the bat or the glove, from the sound of the ball hitting the pads.

Hot Spot

In the wake of wrong results by the Snick meter, Hotspot came into action. Hot Spot is an infrared imaging system used in cricket to determine whether the ball has struck the batsman, bat, or pad. With the use of two cameras located at the loggerhead of the ground, information is gathered based on the physical connection between ball and bat. These cameras sense and measure heat from friction generated by a collision, such as ball on pad, ball on bat, ball on ground or ball on glove. It made debut in the first Test match of the Ashes at The Gabba, in November 2006. In 2012, Melbourne-based BBG Sport introduced a new generation of Hot Spot using high-performance thermal imaging cameras. The hot spot technology is mostly used to review whether the bat has hit the ball, particularly when there is a small nick. If there is contact, the small amount of heat generated is indicated by a change to that area of the bat. Hot Spot uses two infra-red cameras positioned at either end of the ground. The technology is accurate but not widely used because it's expensive — its four camera system costs around £7,500 every day.

LED stumps and bails

Flashing stumps and bails are the latest additions to the game aimed at eliminating errors around touch and go cases during run outs and stumping's. Made by South Australian manufacturer Zing International, the system was first used in the 2012 edition of the Australian Big Bash League. In 2014, the ICC used it for the first time during the semi-finals and the final of the Under-19 Cricket World Cup in the UAE. The lights can be clearly seen and so there will be no doubt whether the bails have been dislodged or not. Having expensive technology, LED bails are used to assist on-field Umpires in making a precise decision at the time of taking a decision like of Run outs. The bails glow as it met with a force. It retains a sensor, a microprocessor, and a low-voltage battery.

Spider Cam

This technology is also used in several other sports. It is a system of wires that allows a camera to move both horizontally and vertically over the area of play. It can be used by television cameras so that they are able to broadcast every aspect of the match from the angle that shows the most action. It can also be used to help umpires look at the gameplay from several different angles so that they can be sure they

are making the correct decision.

Ball Speed Measurement

A camera can be used to measure how fast the ball is travelling. This works in the same way as speed cameras record the speed of vehicles. The device relays a beam from the radar head to detect movement across the pitch; a radio wave is reflected from the moving object which in this case is a cricket ball. This wave is detected by the gun which uses the principle of Doppler Shift to measure the speed that the ball is travelling when it is bowled. It was only in 1999 when Cricket got introduced to the concept of Speed Gun which accurately measured the speed of the ball from one end of the pitch to the other. Though this technology didn't take off as expected, it used highly incisive cameras to track the rotations of the ball once delivered by the bowler. It was firstly used in the 2013 Ashes series.

Super Sopper

To have the optimum conditions for playing cricket, the ground needs to be dry. If there has been a lot of rain before the match is due to start, then the match may need to be postponed or even cancelled altogether. The super sopper is a machine that helps to extract water from the ground meaning that it will dry quicker. Depending on the amount of rainfall that has taken place, this machine can be used to make sure that the ground is dry enough to play on. It can also be used during the match if rain has stopped play to try and get things up and running again.

Chips in Bat

This is the latest technology which has been incorporated in the ongoing Champions Trophy tournament, 2017. The chip is inserted in the handles of the bat and stores bat movements, strokes and images which can all be accessed via software on the computer. The batsman studies their bat-swing pattern and their favorite shots with the help of the data stored in these chips. Technology has helped the game vastly and the game is becoming more 'smarter'. These new innovations have vastly been effective and serve as a treat for the viewers. They also help in analyzing various nuances of the game.

Future Technological Advancement in Cricket

Ever since cricket originated in the 16th Century, the sport has come a long way. With its constant evolution with time, the technology has also kept up with the pace and has changed according to new trends. The **international cricket organizers** are taking revolutionary steps to introduce **technological advancement** in the sports to **boost** the interest of the audience and bring **more attraction to the game**. The technology is growing so fast and in twenty-five years who knows what may be available to the cricketing community, a list of such technological developments has been considered here, which either could become the part of the Cricket.

- Umpire may wear goggles with built in hawk-eye, hot spot technologies.
- As we are watching glowing stumps, we may witness glowing crease and glowing boundary.
- Some fluorescent material may be applied to bat and jerseys to detect edges.
- Ball tracker cameras may be introduced so that cameras move automatically with the ball.
- Some drones may be installed to retrieve the ball when they go into places which are hard to reach.
- Microphones could be installed in shoe or cap of players to avoid abusing. They get activated automatically when they go near the players of opposite team.

- Equipment which can clear off the water immediately could be used in World Cups in case of rain.

Rapid advancement in technology and numerous path-breaking inventions in the last few years have graced the limelight, and cricket, as well, few more are listed below.

Retractable roof

It is not surprisingly to find matches being curtailed due to rain several teams on several instances have suffered the consequences of a crucial match being called off owing to downpour, sometimes amounting to their knockout from major tournaments like the ICC World Cup. Handling of weather is an urgent need for the ICC. Currently, this type of retractable roof is being used at Wimbledon. The 16-metres high moving roof at the Wimbledon Centre Court spans an area of 52,000 square meters. The fabric used is strong, flexible, and translucent to provide light and an airy feel. Lighting installed within the roof come on automatically as the roof is closed. The atmosphere within is maintained by a unique air management system that sucks out condensation and creates a close-to-normal environment within 30-40 minutes, courtesy a supplementary oxygen system. While the idea seems novel, there are but a few issues that need to be sorted out before this is adapted into cricket stadiums. Financially, the difficulties are overwhelming – the construction of the roof has been estimated to be around 150 million pounds.

Compression garments

They are pieces of clothing that provide support which is especially useful for people who must stand for long periods or have poor circulation. Thus, to completely understand this, having an idea about venous circulation in the human body is a prerequisite. Its uniqueness lay in the fact that within the muscle substance are present venous sinuses (spaces) that collect blood from the superficial veins. This blood within the spaces is pumped against gravity towards the heart aided by the contractions of the soleus (as in walking or running). Further, to arrest retrograde movement of the anti-gravity flow of blood, the drainage point into deep veins are guarded by one-way valves that allow blood to flow from superficial to deep. Rugby It only remains to be seen whether international cricket teams also jump into the bandwagon soon.

No -ball sensor

The device appears to be simple, working on the basic principle of a door chime. It shines a light sensor from one side of the popping crease which is duly picked up by the reflector strip placed on the opposite side. Once the foot crosses the line, the speakers emit a beeping sound, like what is often heard during tennis matches.

Inertia sensors

An inertia sensor is basically an instrument that senses change in spatial position of something. A detailed understanding would be possible if one appreciates the working of accelerometers, MEMS gyroscopes and inertial gyroscopes.

Cricket- Drones and Sensors

Drones are all about the data that they gather. The amount of data that they gather is huge. They are the new flying computers. Then there is data-packets that comes from a drone to a Cloud or a device. The

data can then be loaded on a PC or in Cloud. We can visualize that information on a tablet, phone, or computer worldwide. So, it's stored in Cloud, and we can look at it in different places. In the case of Pitch report, images captured by the drone using HD and infrared cameras will provide rich visual data on pitch conditions, such as grass cover, grass health and topology. This useful information can be used by experts to generate pitch reports.

Conclusion

Technology in cricket has come a long way and there are many great positive benefits that have come out of technology. The main positive gained from technology in sport is the fairness that it creates. Technologies used in game situations are always so helpful and benefit both the teams in a very positive manner. Technology in cricket brings a higher quality performance level. With the help of technology, teams can analyze their strength and weaknesses. Players can see some specific aspects of the training like body movement, physical stress over different body parts, core temperature etc. using on-body monitors. Adding to this, coaches and team managers can study this information and use it for their team's benefit.

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