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Use of Technologies in Sport: A Review

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Abstract: Even though, the use of modern technology in sports is in sophisticated level in international context, India yet far behind in sports technology other than in cricket However, other sports like weightlifting, high jump, long jump and hurdles are holding higher popularity in India, but those events rarely use relevant technologies due to their high maintenance cost.

1. Introduction

Technology in sports is a technical means by which athletes attempt to improve their training and competitive surroundings in order to enhance their overall athletic performance. It is the knowledge and application of using specialized equipment and the latest modern technologies to perform tasks more efficiently [1]. The following are the very important Technologies used in major sports events:

I. Soccer Goal Line Technology

In association football, goal-line technology (sometimes referred to as a Goal Decision System)[2] is a method used to determine when the ball has completely crossed the goal line in between the goal-posts and underneath the crossbar with the assistance of electronic devices and at the same time assisting the referee in awarding a goal or not. The objective of goal-line technology (GLT) is not to replace the role of the officials, but rather to support them in their decision-making. The GLT must provide a clear indication as to whether the ball has fully crossed the line, and this information will serve to assist the referee in making his final decision.

A promising prospect has been a "smart ball" loaded with a computer chip, jointly developed by German companies Cairos Technologies and the Fraunhofer Institute for Integrated Circuits, and engineering research and software Development Company, along with the Adidas athletic clothing and Shoe Company. The companies' technology uses a network of receivers around the field designed to track the ball's precise position in real time – including exactly when it has fully passed the goal line. That information would be relayed in less than a second to a watch-like device worn by referee. However, this system has had its setbacks, and another system using, the Hawk-eye, is being looked at. [3]

II. Hawk – Eye Technology

Hawk-Eye is the system already employed by other sports such as tennis and cricket, and will be tested in football for the 2013–14 Premier League season. It uses a network of high-speed video cameras to track a ball's position at a given time viatriangulation. The trial set to take place in the Premier League will use seven cameras placed around the stadium. Knowing the ball's position, Hawk-Eye can tell when it's crossed the goalmouth, and the software alerts the match officials via a radio transmission to the referee's watch.

The system's software can also predict the future path of a ball – it's often used like this in cricket to determine whether the ball would have hit the wicket had it not hit the batsman first, and the predicted path can be drawn on-screen.
Because it can create this kind of visual display it's expected to be popular among viewers of televised games.
As used in tennis, Hawk-Eye has a margin of error of just 3.6 mm, better than the 3 cm required by football's governing body, FIFA. However it needs to be able to see at least a quarter of the ball to work – not always possible if there are multiple legs in the way.
Hawk-Eye has previously been tested in the Hampshire Senior Cup final and at a friendly between England and Belgium at Wembley – although the system's results were only used for evaluation, and the match officials didn't have access to them.

Hawk-eye is the name of a computer and camera system which traces a ball's trajectory. It is being used in international cricket and tennis, and many other sports are also looking at making use of this technology. The system is also being trailed in soccer. The Premier League of Foot ball in the UK has agreed to the introduction of goal-line sensors after being given approval by football's rule-makers. The system was invented by a young British computer expert, Paul Hawkins and was launched in 2001. Hawk-Eye would give a definitive decision on whether the ball had crossed the line. The Hawk Eye uses a camera taking 600 frames a second on the goal-line. The information is analyzed by computer and sent to the referee's headset or a device on his wrist. [4] [5]

III. **Computer Software**

There are numerous software packages that are designed for fitness and nutrition professionals to organize data and produce reports, ideal for visitors to this site. Here are a couple of packages that come recommended by Topend Sports.
• Team Beep Test – the most versatile and useful software for conducting and recording results of the bleep / beep test, with results recorded directly onto your computer.[6]

• Body Byte – a universal standalone computer software program specially developed to comprehensively organize and manage all the information associated with nutrition, training and fitness.
Cricket, has evolved and changed a lot since it was first played professionally in the 1880's. The game has gained immense popularity all over the world and has become one of the biggest sports which are played on this planet. Different forms of this game has emerged over the years like one day cricket and twenty 20 cricket. As the game has evolved, so has the technology. Technological changes has greatly affected the way this game is played and watched, today's cricket has become more accurate and fast paced due to the invasion of technology.

IV. No Waiting for Result Now

Earlier people had to wait one day to read the results of last day's match in the newspaper and then came the radio on which many people listened to the commentary from one transistor. And then came the breakthrough technology, television, here also people had to wait for days to watch the broadcast of one match, until live transmission of cricket matches began. Now people could watch their favorite game as it was happening at the stadium, loud and clear. Nowadays, action replays of batsman's shot, bowler's action and his delivery and a good catch are shown so that viewers can relish amazing moments from a match again and again and again. Archives of recorded matches are stored, so that they can be played in the future.

V. New Monitoring Machines

Newer and more accurate camera techniques have enabled third umpires to give correct decisions about a stroke or a dismissal. A new technology called a red zone is inflicted between the wickets to determine where the ball touched, and in which direction did it go after being hit by a bats man. Even the recordings being used by the third umpire to monitor the stroke are displayed to the viewers so that they can see for themselves that the decision taken is correct. Now umpires can also consult the third umpire on any decision of which they are unsure by contacting him via a walky talky, for e.g. an air ball which landed near the boundary line, to know whether it's a six or a four.

VI. **Sincko Meter**

Another useful equipment is the Snick meter,[7] which can tell whether a ball hit the bat of the batsman before it went into the wicket keeper's gloves. It functions with the help of a computer and high speed cameras, which help in tracking the movement of the ball before and after hitting the bat. Slow motion camera techniques are also used widely. All these techniques have helped umpires to take better decisions; matches have been won and lost due to these techniques.

VII. **Betta - Batta**

Innovations have also been made in the making of bats. A bat designed by Dr. Richard Stretch of the University Of Port Elizabeth, called the 'betta batta' has been specially designed so that it can transmit signals to determine where the ball hit the bat [8]. Similarly soft wares have been developed to analyze player performances, fielding placements, Technological Transformation and Changing Sports bowling actions etc., Technology has wide implications on today's cricket. But leaving that aside, due to use of technology, one thing is for sure that gentleman's game is not gentle anymore.

VIII. Ultra Lite Cricket Leg Guards

People often want a pair of leg guards for playing cricket and especially of the type worn by Sachin Tendulkar, Sehwag ,Yuvraj, Mahinder Singh Dhoni and Harbhajan Singh or other famous batsman of different countries. These leg guards are very different in shape and style in comparison to the old hand stitched bulky leg guards. The new Ultralite leg guards are very light in weight and the batsman feels great comfort in these pads while running. Moreover the ultra-lite leg guards are having shock absorber tendency which provides full proof safety to batsman against the impact of the ball. All over the world this new technique in laggards gained appreciation.

IX. **Head Gear For Cricket**

Headgear or helmet is very important for cricketer. It is used to safeguard all possible damages while playing any sort of game. The significance of headgear is to manage the whole show without taking the risk of damaging your head. Good and comfortable fit, synchronizing with cricketer head, BSI pass headgear is today's call. They are made by polypropylene shall cover with high class fabric with good ventilation systems these parameters are set internationally for a quality headgear and the cricketers select the helmet of good companies like Albion,S.G, Gun and More, Dunken Frinley and many more.

X. **Innovative Face Guards**

The unparalleled face grill is made from Titanium wire for weight reduction and improved strength. The design has been refined to follow the contours of the jaw line, reducing the overall size thus allowing for greater head movement, improving player posture and line of sight.

2. Conclusion

Technology has brought about a significant change in the world of sports. Though originally the use of technology had its share of detractors, their argument being technology slowing down the speed of the game, no one can deny that the right of a sports team or a sportsperson's right to a fair game devoid of incorrect decisions. Technology has done away with all the squabbles regarding match decisions. In the earlier days, whatever decision was made by the match officials was considered the last word. Though efforts had been made by all the great sports governing bodies of the world to do away with bias, yet the element of human error still remained, and will continue to exist. What technology strives to do is to remove the element of human error in the course of a match being played. Today, in the world of sports, technology has become a part and parcel of the entire event. Other than in the area of broadcasting and televising a sporting event, technology also plays an extremely import-ant part in the game play.

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