

The Growth of Information & Communication Technology: How it changed the Scenario of Sports?

Dr. Yasir Zafar Khan

Faculty (Computer Science) STS, AMU, Aligarh

ABSTRACT : Sport and exercise science like most areas of life have been affected greatly by technological advancements. It is difficult to imagine modern sports and various sub-disciplines of exercise science without technologies. The use of technologies is, without exception, tainted with frustration and ambivalence. Paradoxically, it is the omnipresence of technology that has contributed most to people's inability to fully grasp the scope and depth of its influence and also uncertainty as to what role various technological advancements play in sports. Importantly, technology has in many ways changed what we think of as the athletic body. It is recommended that those managing, handling and using sport must be equipped to make wise choices on the type and use of sport technologies that would assist in the right performance. In this paper we have tried to assess the influx of sport technologies and the impact of technology on sport performance, types of sport technologies in modern day sports which have profoundly changed the landscape of sport and exercise science in this modern world.

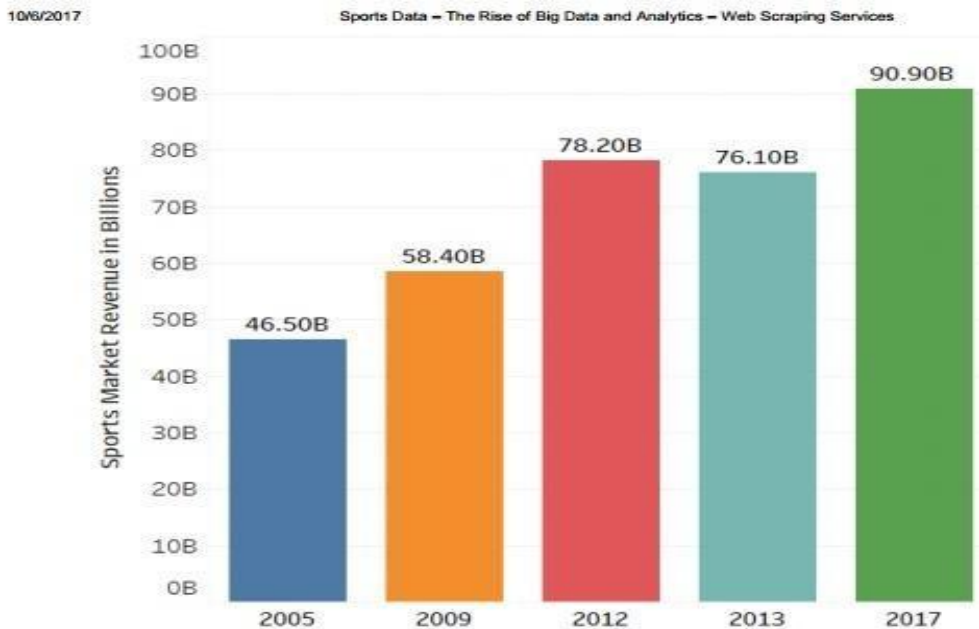
I. INTRODUCTION:

In recent years, technology has had a gigantic impact on almost every aspect of our society. The world has changed tremendously, and people are now about to gain information more quickly, communicate more directly and effectively, and grow ideas. Technology has impacted every corner of society and every industry--from healthcare, to government, education, business, and sports.

While it is not always instantly apparent, the impact that technology has had on sports is vast. Many processes are now easier and quicker, and the industry has seen an increase in attention and revenue because of it. Here are three ways that technology has changed the sports industry. Technology has an important role in sports, whether applied to an athlete's health, the athlete's technique or equipments characteristics. As sports have grown more competitive, the need for better and fancier equipment has arisen. Such as Golf clubs, bicycles, Footballs and helmets, tennis racket, baseball and cricket bats, hockey sticks. Ranging from nutrition to the treatment of injuries, as the knowledge of the human body has depended over time, an athlete's potential has been increased. Athletes are now able to play an older age, recover more quickly from injuries and train more effectively than previous generations of athletes. Advancing technology created new opportunities for research into sports. It is now possible to analyze aspects of sports that were previously out of reach of comprehensions. Being able to use motion capture to capture an athlete's movement, or advanced computer simulations to model physical scenarios has greatly increased an athlete's ability to understand what they are doing and how they can improve themselves.

II. SPORTINGTECHNOLOGIES

Sporting technologies are man-made means developed to reach human interests or goals in or relating to a particular sport. 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 specialised equipment and the latest modern technologies to perform tasks more efficiently.



Areas of Information Technology In Sports:

Administration: to produce documents/ lesson plans, to convert scores (using Ms-office) Management: Class organization and time management Feedback: video, P.C., heart rate monitor. Remedy: heart rate monitor, educational software. Evaluation: video, use the digital camcorder to analyze students in action.

Professional development: lifelong learning/ continuing education, sharing experiences. Public relations: communication with the outside world via video conferencing & Internet.

III. TECHNOLOGY USING IN SPORTS

Technology is extremely useful in sports for many reasons as video officials use ICT to help them make decisions which would be hard to see normally. The use of Technology makes the results more accurate and well-organized. Also Technology provides evidence for the officials so they will not receive complaints or abuse from the opposition.

Some sporting organizations may use a computer to assess sports injuries: In Athletics, technology is used to detect false starts. Use of websites for the advertisement of sporting events has become a common phenomenon in recent years. Computers can be used to design floors for Indoor Sports Computer Aided Design of sailing boats or for Kayaks or for Formula One.

- Computer Aided Design can be used for Tennis Racquets. Leisure Centers usually now use computerized booking systems and building management systems, and email their customers.
- Individuals watching sport Individuals can subscribe to RSS Sport feeds. Scores & Fixtures are available to view online.
- Use of Digital TV to provide interactive features when watching sport. Star Sports and Sky Sport use software to help cameras track the ball in cricket, tennis and other sports
- Telegraph article on this - Law-makers approve testing time for goal-line technology.
- "Snick meter" used in cricket to track the ball's passage past the batsman by picking up sounds from pitch and stump microphones.
- Some games are broadcast via live webcasts. Wireless technology is used by police to tackle football & cricket hooligans.
- Spectators can use PDAs or Smart Phones to receive live game content and instant replays.
- Electronic display boards to display results at matches Individuals may have their performance filmed frame-by-frame using a camcorder, to help them focus on their technique.
- Some clubs have used Apple iPods to play back these movies so that competitors can

- watch the frames over and over again.
- Use of the Internet to check weather conditions for sports such as skiing or surfing. Use a mobile phone to improve your golf swing! Systems can be fitted to helmets to inform when a concussion has taken place - Riddell Sideline Response System.
- Sensors can be used to monitor the force exerted by a swimmer Virtual Reality games can
- be used for practice of sporting techniques Nike + iPod Sport Kit can help to motivate runners when training Golfers can use a wrist-mounted computer to measure their swing and download statistics to computer.
- Sports watches and heart-rate monitor's help with keeping fit. In sailing races, navigation
- software is used, connected to the Internet and GPS for tracking location.

IV. ASSISTING THE UMPIRES/REFEREES

- Most professional sports in the United States have long used instant replay and other high-tech aids to help referees make the right call. Gridiron has used video replay systems
- to check referees' calls for many years.
- Basketball referees use replay systems to make sure players are shooting within the time allotted by the shot clock.
- In international cricket, the third umpire has been used, one sitting off the ground with
- access to TV replays of certain situations (such as disputed catches and boundaries) to advise the central umpires. The umpires out on the field are in communication via wireless technology with the other umpire. The third umpire is also asked to adjudicate on run out decisions, which he makes without consultation with the two central umpires.
- One sport that has resisted the use of high-tech assistance until very recently is
- soccer/football. Replays could be used to decide off-side decisions, whether a ball passes over the goal line, and clarify penalty decisions.

V. HAWK-EYE TECHNOLOGY

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 trialled in soccer as part of the goal line assessment. The Premier League of Football in the UK has agreed to the introduction of goal-line sensors after being given approval by football's rule-makers. The system being developed by the UK company 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, with the information is analyzed by computer and sent to the referee's headset or a device on his wrist. In 2015, Hawkeye technology was also used by rugby officials at the 2015, Rugby World Cup, to improve decision-making by the television match official (TMO) and also assist with player safety. In this case it is enhanced video review, rather than the ball tracking technology as used in other sports.

VI. BUYING TICKETS

Not too long ago, buying sports tickets was sometimes as hassle. If you had extra tickets or you wanted to buy some, your only option was scalping. Trading or otherwise obtaining tickets was a costly process that took time and was not very efficient. Now, however, sports fans are able to buy tickets online in a matter of minutes. New online platforms like Groundwala and Oyeplay have made it easy and convenient to check in and coordinate the entire ticketing process, which entices more people to attend sporting events. This has spiked growth across e-commerce, with websites like Facebook offering fans the chance to purchase and sell tickets without having to navigate through ticketing websites. Apps now offer ticket purchases, with their official apps such as BCCI official app bringing ticket orders to the palm of people's hands. For sports fans, making a last-minute decision to go to the game is now a reasonable possibility

VII. SPORTS SPECIFIC

- Tennis - it is now standard at the major tennis tournaments for a line review system to be in place, with players given power to review contentious line calls. It is powered by the Hawk-Eye ball tracking system.
- Soccer / Football - Soccer is looking at joining the 21st century, looking at various technologies for the goal line to determine if the pass passes over the line or not.

- Basketball - the NBA uses replay vision to review 'last touch' decisions in the final two minutes of games, and also to determine whether players release the ball before the shot clock expires.
- Cricket - technology in cricket has been driven by advances in the TV coverage. Things that were once extra information provided by the TV networks are now being incorporated into the decision referral system (DRS), such as hawk-eye and hot spot, and maybe even the old favourite snicko.
- Aussie Rules Football - umpire review system has also been implemented in AFL, with an off field umpire in certain circumstances adjudicating on whether the ball passes over the goal line or is touched, using video evidence via multiple camera angles.
- Baseball - In 2014 a challenge system was put in place for the MLB to use replays to challenge certain umpiring decisions.
- Rugby Union - In 2015, Hawkeye technology was used by rugby officials at the 2015
- Rugby World Cup. The video review technology with synchronised camera views was used to improve decision-making by the television match official (TMO) and also used by medical staff to assist with player safety by identifying possible concussion instances and behind play incidents.
- Rugby League - The NRL was an early implementer of using the video referee to help adjudicate questionable tries.

VIII. COMPUTERSOFTWARE

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.

BodyByte : a universal standalone computer software program specially developed to comprehensively organize and manage all the information associated with nutrition, training and fitness.

Visual Analysis : The visual analysis software allows students to view captured movement and to analyse them. This particular technology can help teachers to control student's progress towards motor skills goals; provide feedback opportunities and assessing students learning (Fiorentino and Castelli, 2005). Using digital video camera to record pupils' performance in table tennis for example, can be a useful tool to help students improve their techniques. With the addition of motion analysis software, pupils have a professional supportive tool.

Desktop publishing A combination of text, graphics and layout to produce a document.

Presentation software – For example, Microsoft® PowerPoint – software displaying information in slide form...

Tools(Devices)usinginSports: : Recent developments in sporting technologies have created a variety of products aimed at improving and increasing athletic performance.

Pedometers : Theses apparatus also called step counters are mechanical sensors used to count steps and can easily be incorporated in PE classes. They address motivation, assessment, and advocacy. Furthermore, they are portable and can be worn under the belt and be kept the whole day. Today, it can be said that the pedometer has become a recognized acceptable tool for measuring physical activity. Students can wear a pedometer and receive immediate and continuous feedback regarding their activity

Heart Rate Monitors : Based completely on the student ability level and current level of fitness, the heart rate monitor makes learning more student centered. It also provides immediate feedback that can make students work harder (Bian, Partridge, King, Andon, Boyer, 2007). As fitness level increases, student feel that their cardiovascular system is working and can set individualized goal to work more effectively.

Digital Video camera and visual analysis software : The use of the motion analysis system will surely enhance many areas of the physical education curriculum both in research and teaching. Using digital video camera has indeed simplified the collection of data. These results can then be imported to carry out interactive multimedia presentation to provide students with a better understanding of the importance of breaking skills into components and the consequences of subtle variation in techniques (Ladda, Keating, Adam, Toscana, 2004). Internet A global network providing the capability to communicate, share ideas and access information and resources from around the globe. It is important to note that computer networks need not be limited to a single site or facility. Wide Area Networks (WANs) can link together sports administrators located throughout a country. For example, all of the regional offices of a national sports governing body such as the National Football Association can be linked together regardless of their geographic location. All of the operatives so linked can share administrative and programming information and communicate with each other cheaply and efficiently through the medium of e-mail.

Intranet is similar to the Internet, but information from within a school or organisation.

CD-ROM Information is presented in the form of graphics and text with sound and moving video Data handling Information can be stored in a database.

Through using Information technology to improve the standard of Sports in the following process:

To update the health status of players

- Preparing training schedule
- Video Feed back for players practices
- To assessment of physical activity by using Information Technology. Storing the results
- To analysis the team performance at the time of competition.
- Online registrations and profile verifications.
- The Coach can have the self-appraisal through the Information technology. Storing the personal data's of athletes.
- Search engine for the latest training in sports.

IX. CONCLUSION

As it is stated above during the recent years there has been a constant change in the use of technology. Cricket is the main reason behind attracting a large amount of revenue in India. With the involvement of private sector in sports, technology has changed the face of sports. Since the inception of IPL 2007, and with the existing consumer base in India together with the collaboration of BCCI has impacted the sports. Advances in technology have had a profound impact on sport including: Analysis of sport performance and enabling coaches to greatly improve the quality of feedback to players/athletes. Increase accuracy in time measurements of sport performance. Improvements in the design of sport equipment and apparel.

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