

Impact of Artificial Intelligence on Sports Fan Engagement

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Abstract— This paper covers the impact of artificial intelligence on sports fan engagement. It talks about the development of AI in sports, the first software used, who created it and how it evolved over the next few decades. It is then followed by the recent addition of various Artificial Intelligence based services over the past few years for example: chat bots, automated journalism, automated highlights and many others like artificial audio and visual effects. The subject is explored and supported by a survey where questions are asked about the impact of the implementation of AI in a sport, activities related to watching sports on television and various streaming platforms as well as things participants as fans would like to change. It is then followed by a in depth data analysis and conclusion.

Index Terms— Artificial Intelligence, journalism .

I. INTRODUCTION

Computer Science, a boon or bane when it comes to fan engagement and sports? In recent years, this has sparked a debate between many pundits and fans. It has finally conquered sports as well and recent activity on social media has shown that many fans are unhappy after recent tech-additions to the sport. Sports has always been loved by everyone from watching the NFL and the NBA to individual sports like tennis and golf. It has become an integral part of many around the world, they may do it to remain fit, play competitively and certainly watch it. Computer Science has impacted many sectors and provided many with jobs. Jobs include managers and programmers while fans are provided with many other services as well as a chance to compete in esports and allowing them to make a career out of it. Recent comments have shown that both fans and pundits (retired players) are divided on whether some services that exist are beneficial to the sport or not.

II. REVIEW OF LITERATURE

Artificial Intelligence(AI) is the ability of machines to perform tasks using their intelligence and have a programmed skill to have similar decision-making abilities like a human. Tasks artificial intelligence can perform include speech and image recognition, decision-making, and analysis. An example of this includes Siri. Fan engagement in simple terms is how are the fans connecting with their favourite team, player, or sport. It is how the experience of the fans are enhanced by various services which help them connect to the who they support.

This AI technology was first introduced to sport in 2006 and was developed by Dr Paul Hawkins and few engineers at Siemens subsidiary Roke Manor Research Limited. It was introduced to the Wimbledon and the name of the device was Hawk-Eye. Then it was soon introduced to other sports as well.

About 3 years ago, the IBM introduced 'SecondSight' which not only monitored the speed of the ball but of the movement of the players as well. Furthermore, many broadcasters and analysts relied on the manufacturers 'Keys to match' technology to enhance their stream. This system was also an extension of their 'SlamTracker' technology and gave analysis of how the match might play out using previous encounters, personal analysis and play styles.

However, the use of Hawk Eye on 21st May 2001 between England and Pakistan sparked confidence among other sports to utilize this piece of technology. It provided a vast array of stimulations to provide decision where there was uncertainty to the umpire/ referee. However, in sports like football Hawk Eye was introduced in the premier league in the 2013-14 season. Soon in 2016, the VAR (Virtual Assistant Referee) was implemented in the USA and then in 2017 to other leagues. As the years progressed different sports developed, and it also affected fans. AI has now become an integral part even in fan engagement.

Recent additions include:

- Chat bots
- Communication (discord, social media)
- Automated video highlights
- Automated journalism
- Presentation using better Audio and visual effects
- Online video games created by the leagues

Chat bots are assistants at the bottom right of the webpage that often provide help by following a set of instructions and respond appropriately to key words. They respond to certain commands with a pre-written answers to give information. Most of the times people frame questions differently and the chatbot is not able identify the right command to reply with, hence many prefer minimal interaction whereas those who know how to interact with it or have previous experience find it quite easy to use. Automated video highlights are short parts of the match which are compiled into a video. These clips are selected based on noise around them, emotion, and movement. Since machines cannot identify useful clips or plays created, engineers have based this on emotion and noise created by the crowd. Automated journalism is when AI write articles on sports based on recent knowledge and their skill set. These are often used by many firms to expand their sports coverage capabilities and earn more revenue.

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Communication to fans has been enhanced over the past few years mainly through social media apps like twitter and Instagram. This has helped establish a stronger connection between the fans and their team/player/sport as they receive constant updates related to it. The next is the enhanced Audio and Visual effects involving presentation. Over the recent years as devices have developed computers have been equipped with better hardware as well as the ability to do more things. Audio and Visual effects were added to sports to entertain fans during intermissions, before the event or to add sound effects as well as animation if something good happened during the event. Recent impact of this was seen during the pandemic when fans were not allowed in the stadium hence broadcasters used these effects to stimulate a stadium like atmosphere for viewers at home. Many organisations have created games for their leagues like the NBA has their own game which gets upgrades annually while the Premier League has a feature on their app called Fantasy Premier League which is related to data analysis and is quite competitive. Over the years, comments on online forums suggest that this has helped fans connect with teams and players they didn't know and look at the sport in a slightly different way.

Considering the recent development of AI technology over the years, many theories have been developed. One theory suggests that after games have added virtual referees it likely that in the future many assistant coaches will be AI. Since AI gives the ability to analyse large data quickly and store more data as well. It can work at a much faster rate and analyse common mistakes (trends in data) immediately. Many suggest that this may be used to construct game strategies and may be used to make decisions on the pitch as well. This theory was put to test in the NFL recently.

Another interesting theory suggests that many other sports may be created using artificial intelligence since its use has become so prominent in all sectors from health to cooking. Theories suggest that games may be created through simulation by using virtual reality.

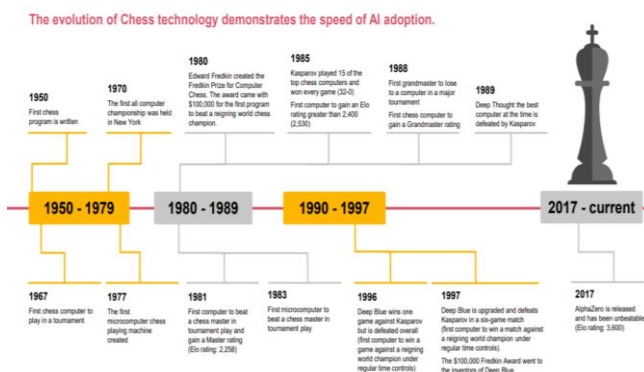


Figure 1 evolution of technology in a sport like chess

Age

203 responses

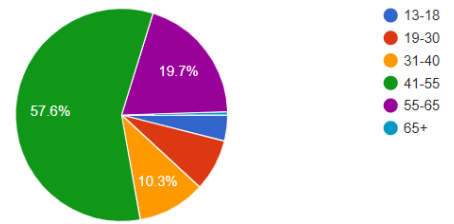


Figure 2 – Participating fans age groups

Many fans have been left stunned by this as it is new to them. Some believe that addition of technology to sports has been quite beneficial and should continue while others with mixed opinions suggest that it ruins the spirit of the sport and quite dependent on devices which restrict “physical activity”.

III. AIM

The aim of this research is to identify the impact of computer science on fan engagement and sports and also to gain knowledge about how it has benefitted spectators/fans and what challenges has it posed to them.

IV. METHODOLOGY

A survey was conducted and a total of 203 responses were received. Responses received were from age groups of 13-18, 19-30, 31-40, 41-55, 55-65 and 65+. These were scattered across various countries including: India, The United States of America, The United Kingdom, Singapore, Canada, The United Arab Emirates and Australia. This data was obtained through a survey conducted by me which was sent across to contacts around the world. The data I obtained was then analysed using bar charts, pie charts, linear scale and going through responses.

V. DATA ANALYSIS

The research was conducted, and these results were obtained.

As the pie chart in Fig.2 shows, most responses obtained are from the higher age groups including 41-55, 55-65 and 31-40. So, this shows that most of the data obtained will be from people who have actually seen this industry grow as the use of computer science/technology in sports was implemented in the early 2000's.

As a fan, how do you keep up with your favorite sport /sports team/player? (Select all that apply)

203 responses

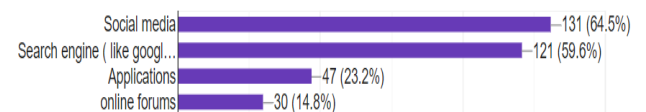


Figure 3 – Updates channels used by fans

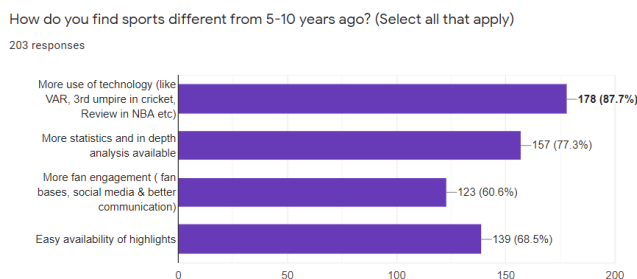


Figure 4 – Sports over last decade

Fig.3 graph shows that most of the participants kept up with their favourite team, player through the internet via the means of applications, social media, forums, or search engines like google. Whereas the rest received such information through the newspaper and television. This also shows that the internet has had an impact in fan engagement and has helped deliver news to people much more easily rather than waiting for scheduled programs on the T.V or waiting the next day for the newspaper.

As the data in the Fig.4 graph shows, 87.7% of the participants believe that there has been more use of technology in sports (like virtual assistant referees) compared to the last 5-10 years. Furthermore, 77.3% of the people believe that more in depth statistics and analysis is available compared to the last few years. About 60.6% of the participants believe that technology has enhanced fan engagement through the means of fan bases, social media, and overall better communication. Lastly about 68.5% of the participants believe that highlights are much more easily available than the last 5-10 years.

Overall, this graph shows that the use of technology has been quite beneficial to the sports industry through additions like Virtual Referees, better statistics, highlights and has enhanced the overall fan experience.

As shown by Fig.5, majority of the participants prefer to use only one device while viewing livestreams whereas others prefer to use them occasionally. The remaining 10.3% of the participants prefer to use another device to view statistics, other live updates or watch something else simultaneously.

The research also shows as depicted in Fig.6, that 74.4% of the people believe that the addition of technology to sports has increased the fairness to the game whereas the remaining believe that it makes the games too clinical or loses the momentum of the game or delays the game time.

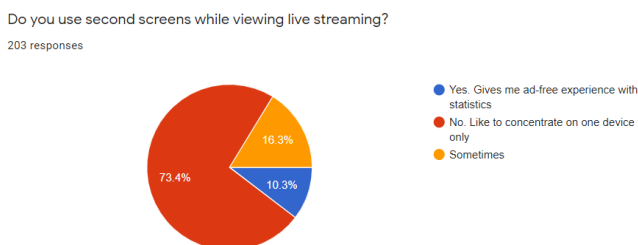


Figure 5 – Second screen viewing

Technology like artificial intelligence (AI) is used in sports like tennis, basketball, football, cricket etc. to assist referees, teams during the game. (e.g. simulation for LBW decisions in cricket, ball in/out of line decision in tennis) As a fan, what are your views on this:

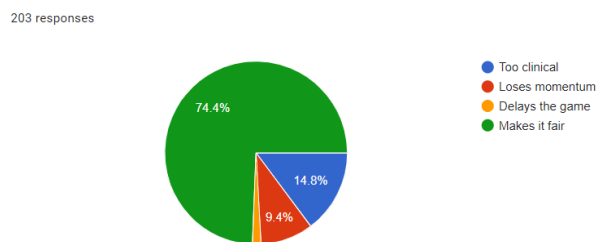


Figure 6 – Fans views on use of AI

The data obtained portrays as shown in Fig.7 that most of the participants rarely or never use the automated chatbots available on websites while the rest use it in the split of 22.7%, 15.3% and 6.4% respectively for 3,4 and 5 on the linear scale.

Using this data-set it can be concluded that this feature added to team websites to enhance fan engagement has not been successful as many believe that it “takes too much of their time” or “doesn’t respond correctly” to their messages.

Another creation made by sports organisations to enhance fan engagement through the means of videogames has not been successful. As shown in Fig.8, about 75.9% of the people rarely or never use it whereas the rest use it. The graph shows a downward trend on the scale for usage which also shows that it may not be the best.

This pie chart Fig.9 is nearly an even split however in this case the option of ‘Yes’ takes the edge when it comes to whether sports predictions make it enjoyable for you. This is of course based on past results and individual statistics.

Fig.10 bar chart portrays that relatively many people approximately 74.8% enjoy audio and visual effects while watching games. Whereas the rest remain on the scale of 1 or 2. The trend shown is a rising curve however at the end there is a dip.

Fig.11 graph shows a balanced split when it comes to game highlights. About 28.6% of the people prefer watching standard highlights while 29.6% of the participants prefer short length highlights. Then 16.7% of the participants prefer watching the full highlights or the full game. The remaining 14.3% prefer short highlights based on their viewing history whereas the remaining 10.8% would like to choose their own clips/moments of the game.

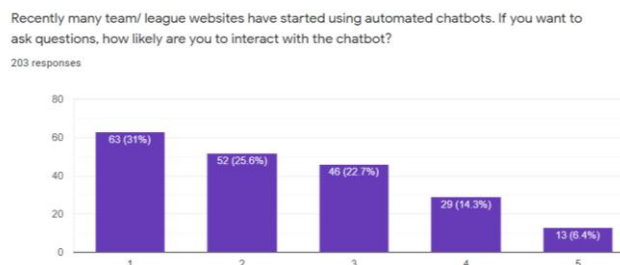


Figure 7 – Fans use of chatbot



Figure 8 – Use of virtual games by fans

VI. RESULTS AND DISCUSSIONS

Most of the viewers receive their news/ updates related to sports via social media whereas the rest receive it through the newspaper and television. The use of social media has been exhausted around the world due to its rapid response and there is no surprise here that many use it for sports updates. This also shows that computer science has increased fan engagement and has made it easier for both sides [teams/organisations and fans] to communicate with each other.

Most viewers believe that there has been more use of technology in sports and there has been more detailed statistics and analysis compared to the last 5-10 years. The use of technology has increased significantly. From the virtual world to the real world. From using artificial sounds to virtual assistant referees in games. Technology has evolved both sports and related fields. With higher processing power and complex function, machines can now predict results based on past results and overall performances. They can also give in depth analysis and statistics.

73.4% of the viewers prefer not to look at other streams while live streaming while 10.3% do. 74.4% of the viewers believe that the use of technology makes the game fair whereas the contrary 14.8% of the viewers believe that it makes the game clinical. This is because constant pauses during the game often make the game boring and it loses the intensity and momentum. People believe that some errors are bound to happen, and it only makes the game more natural rather than clinical. However, its better to make the game fairer so that errors made are rectified and it evens out the playing field.

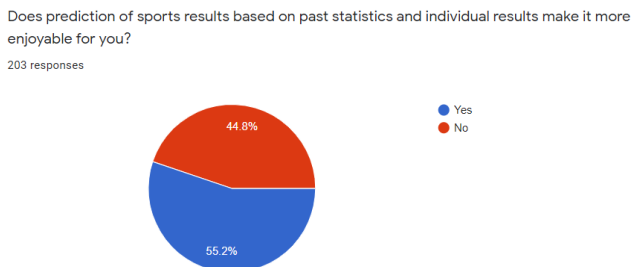


Figure 9 – Do fans enjoy games prediction?

Using different tools, Sports organizations are enhancing audio and visual effects in the stadiums/ online live streams. e.g. artificial sounds in empty stadiums during the pandemic. To what extent has this enhanced watching games?

203 responses

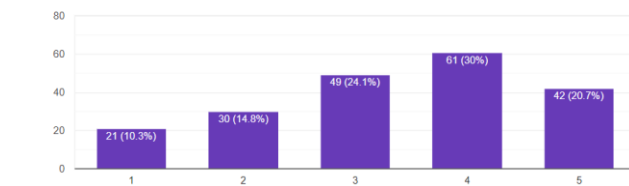


Figure 10 - Enhancing audio visual effects using AI

Nearly 55% of the respondents never use automated chatbots while visiting sports related websites whereas 13 people always use chatbots on sports related websites. This is because the concept of chatbots is new to many and they are reluctant since they may have past interactions which may not have been good. A chat bot is supposed to act like a human and respond with the correct/appropriate answer however since they are machines, they respond based on certain key words and hence the response may not be accurate. Because of this reason many do not prefer interacting with chat bots.

122/200 people never play fantasy games created by sports organisations whereas 4 people play it regularly. This concept is relatively new to people, and many enjoy watching the games rather than spending time analysing them.

112/200 people enjoy sport predictions when statistics are presented and nearly 75% of the people believe that audio and visual effects have enhanced viewing on live streams and physically in stadiums. Nearly 75% of the people enjoy audio and visual effects since they simulate a real-life event just like the ones in stadiums however at this point in time no audience is present due to the pandemic. The rest believe that it does not create a natural and real atmosphere and hence do not like the use of these tools.

Lastly, majority of the votes 29.6% were given by people who prefer watching short highlights while the minority 10.8% would like to create their own set of highlights based on moments they liked. Highlights are based on personal preference some prefer short highlights; some prefer customized clips, and some prefer watching the whole game. Hence the responses received are scattered.

Your preference for watching short length game highlights based on different criteria like best game moments/ highest scores/ game changer events etc?

203 responses

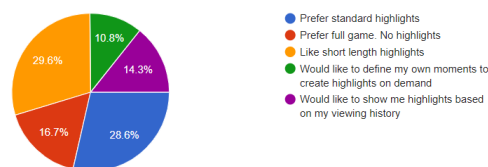


Figure 11 – Highlights viewing experience by fans

VII. CONCLUSION

AI technology has affected sports, and viewers have mixed opinions. However, it has increased the fairness of the game and enhanced fan engagement worldwide through social media, websites and enhanced online streams to audio and visual effects.

VIII. ACKNOWLEDGMENT

I take this opportunity to thank my survey respondents for giving their time to participate and provide valuable inputs. I also thank my mentor Ms. Rajni for guiding me through the research.

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