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Video Assistant Refereeing (VAR) in the management of football matches: Are Football Fans Satisfied with this Technology

Karan, Kashveer

2023
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Karan, Kashveer. (2023). Video Assistant Refereeing (VAR) in the management of football matches: Are Football Fans Satisfied with this Technology [Master's dissertation, University of the Witwatersrand, Johannesburg]. WireDSpace.https://hdl.handle.net/10539/39993

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Video Assistant Refereeing (VAR) in the management of football matches: Are Football Fans Satisfied with this Technology.

Applied Research Project

Submitted by:

Kashveer Karan

Student Number: 2501810

A research article submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2023

Protocol number: WBS/BA2501810/754

(Version July 2023)

DECLARATION

I, Kashveer Karan , declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Kashveer Karan

Signed at: Randburg.

On the 25th day of July 2023

ACKNOWLEDGEMENTS

I would like to acknowledge all the challenging work of my supervisor Doctor Lumkile Mondi in his perseverance in motivating me to get this research done with such quality and accuracy. I would also like to thank the Wits Business School in ensuring during a time of uncertainty (COVID-19 Pandemic) for keeping me on the right track and providing all the necessary materials and skill sets to achieve this research project. During the pandemic, the online classes were a huge challenge, however, Wits Business School and its Faculty were always a call or email away to support.

A huge thank you to my wife and family who are always there for me particularly during the last two years of studies. Having a small kid before starting this MBA journey was not easy, however, my wife Rohini Karan ensure she played both roles whilst I was busy attending this course.

I would like to thank all the participants for answering the call and taking part in my online survey. Without their support and interest in my topic, my research would be incomplete.

Lastly, I would like to thank the FirstRand Bank Limited Group for sponsoring my bursary to achieve one of my long-standing goals by getting my master's in business administration. The bursary funding together with my global study tour has taken a lot of financial pressure off me and through this work I am ensuring that their sacrifice and trust is paid off. I would also like to thank my managers at the bank for allowing me the relevant time off to focus on this degree.

Supplementary Information

Supervisor: Dr Lumkile Mondi

Word Count: 13101

Supplementary Files:

- Survey Questionnaires,
- Consistency matrix,
- Participant sheet

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Abstract

Video assistant referee (VAR) is comprised of three people who work together to review controversial decisions made by the on-pitch referee in football matches. VAR is used in four match-changing situations; penalties, red cards, goals, and mistaken identity (Chandler, 2021; FIFA, 2021). There are various gaps in past literature; notably, previous studies have not explicitly focused on the emotional impact VAR is having on both players and fans. With the introduction of goal line technology and VAR, the International Football Association Board (IFAB) and Federation Internationale de Football Association (FIFA) finally made it possible for technology to assist referees in making decisions during games. Technology has long been a part of sports, and recently football has begun to modernize as well. In this research report, the impact that VAR has on football fans will be analyzed. The analysis will cover VAR's shortcomings, research into whether it is the best technology to correct human error, football fans' opinions of VAR, and whether AI and future technology might someday be used to assist referees in evaluating subjective in-game contentious situations.

A quantitative methodology was used in this research report using the Qualtrics online survey to assist in identifying the satisfaction amongst footballing fans. This exercise had a successful population sample size of fifty-six people. A good mixture of views from both male and female representation, together with a very experienced age and number of years of watching football. This online survey was distributed to local footballing teams, supporter’s clubs, social clubs, and footballing communities.

The overall results established is that the VAR technology and process is highly inconsistent, however this sample population see the merit in the VAR technology and believe there is a high potential for this technology to provide more fairness if certain aspects are changed. Some of the aspect which scored low in the survey, were related to the current process and how much this technology is impacting the games natural flow.

1. Introduction

This chapter provides an overall review of the research topic, the background, the problem statement, the motivation for doing this research, the context, the scope of the study, the assumptions as well as the limitations of this report.

1.1 Background of the Study

From the first picture finish photographs of horse races captured in the late 19th century to millimetric judgement made today in a variety of sports, technology has been employed in sports for an exceptionally long time. Technology has made the sports world a more accurate, fair, and pleasurable experience for everyone involved. It may be used to enhance officiating, coaches' judgments and analyses, players' performances, game fairness, and even the viewers' experience. Football refereeing is a challenging job that requires split-second analysis of complex and fast-paced in-game circumstances that may include many players and have very little visibility. (Lex, Essig, Knoblauch & Schack, 2015).

Concerns and a great deal of criticism have been raised over the technology's introduction into football fields, and these worries and criticisms still tend to be often aired amongst fans. VAR is "generating as much uncertainty as clarity," (Ogden, 2017). Others claim that the use of VAR is hurting football in its purest form and that it is overstepping its bounds by almost removing all human mistake, which is an inherent part of the game. In the end, this lessens ambiguity, which may be causing players and spectators to lose interest. Upsetting the natural flow and ambiance of the game could be robbing football of the raw passion that players and fans yearn to feel.

When it comes to sport, football can be given the title as the most popular sport as it involves a larger association of millions of players together with billions of fans worldwide (Muller, Simons & Weinmaan, 2017). Football which also has an interchangeable name soccer in some parts of the world, has taken on the term as ‘the world’s game’ (Pifer, Wang, Scremin, Pitts & Zhang, 2018). In addition, and support of the footballing stance globally, Muller et. al (2017) and Pifer et.al (2018) are aligned in the facts that football has

billions of viewers in events such as the FIFA World Cup and various domestic club leagues across the world.

One of the most important aspects of sport is refereeing and adjudication (Marcio, Consta, Felipe, Rodrigo & Felipe, 2021). In football, referees together with their assistants are expected to apply the rules of the game and ensure that decisions are taken with speed, and are highly accurate (Marcio, Consta, Felipe, Rodrigo & Felipe, 2021). In an attempt to get rid of any inaccuracies and inconsistencies with decision making, the Video Assistant Refereeing (VAR) was developed (Marcio, Consta, Felipe, Rodrigo & Felipe, 2021). Samuel, Galily, Filho and Tenenbaum (2020) asserts that the Video Assistant Referee (VAR) system was brought in to reduce decision-making errors in the game's play.

In 2018, the International Football Association Board (IFAB) took a decision to introduce the technology of video assistant refereeing known as VAR into football's rules and regulations (Tamir & Bar-eli, 2021). A solution was needed to address the famous phrase of 'part of the game' which was commonly used to justify poor refereeing decisions that were made during the game and raised by fans (Tamir & Bar-eli, 2021). In addition, the justification to implement this technology in football has enabled the best athletes or teams to compete fairly and win without having wrongful decisions going against them impacting on the result, which could have bigger implications on both teams and sporting fans alike.

In the 1966 World Cup final between England and West Germany at Wembley stadium in London, when the score was tied 2-2, English striker Geoff Hurst made a shot that hit the underside of the crossbar, bounced down on the ground, and was cleared by the West German goalkeeper. The referee's potential influence on the outcome of a game is monumental, and major tournament results have been conditioned by contentious referee calls. One of the most contentious World Cup championship verdicts in history occurred when England won the game 4-2 in the final score. The phrase "Wembley goal" was also used to describe a "Ghost" or "Phantom" goal that was awarded in a comparable manner but was not actually scored.

The decision to introduce the VAR technology seemed to be forced onto FIFA due to pressures from footballing fan to create some fairness (Winand & Fergusson, 2018). Therefore, being a late adopter of this technology has led to many teething problems and footballing fans seem to be frustrated with how the VAR technology is currently being used and interrupted (Zglinski, 2020). The Video Assistant Referee (VAR) is a slow-motion replay that referees can make use off during a review process (Mather & Breivik, 2020). Video assistant referee (VAR) is used in more than 20 leagues throughout the world according to the International Football Association Board (IFAB). In the research done by Mather and Breivik (2020), VAR can be used to assist in making four potential decisions which are considered to be the most critical aspects of refereeing:

1. Goals- in this instance, was there any type of infringement that could rule out/ take away the goal that was given.
2. Penalty decisions- in this instance, is the decisions to either dismiss or reward a penalty kick the right choice.
3. Mistaken identity- in this instance, is the sanction of relevant disciplinary actions been properly applied to the correct player or team.
4. Red-card decisions- in this instance, is sending off a player or not the right choice given the circumstances reviewed.

The VAR technology increases the strength in the authority of the referee (Bar-eli 2021). However, whist conducting the research, Bar-eli (2021), mentions that Klein who was from the Israeli international Football Referees had disagreed with the implementation of this complex technology in football and as a result this damages the refereeing authority and how football matches are managed. In agreement with referee Klein, the Federation Internationale de Football Association (FIFA) has also been reluctant to introduce technologies that impact the way the game of football is officiated (Winand & Fergusson, 2018).

Despite earlier studies, the emotional component of VAR has not been studied. Many studies urged more investigation into the effects VAR is having on professional football (Winand & Fergusson, 2018). The closest comparable research, rather than the

emotional reaction of players and supporters, have concentrated exclusively on how spectators perceive VAR.The aim of this study is to address if football fans are satisfied with the implementation of VAR in the way in which football matches are managed.

1.2 Problem Statement

VAR was implemented to make football fair and accurate, however due to the elements of human judgement associated with the VAR process, this has only heightened the footballing debates with football fans. It has been demonstrated that the VAR has a detrimental effect on the opinions expressed on social media by English Premier League fans (Kolbinger & Knopp, 2020), and it is probable that this is true in other leagues that have implemented the VAR. In a similar vein, football managers often dispute or disagree with VAR rulings when they favour the opposition, and VAR has emerged as a key topic of conversation following games.

IoT use is accelerating across a wide range of industries and is expected to continue for some time. For instance, wearable sensors and motion sensors are already employed in sports training and health monitoring. Medical sensing devices are also getting increasingly portable, enabling players to wear them throughout training sessions for monitoring. This gives training personnel the possibility to record their players' data at any time from anyplace. (Zhan, 2021). Its quick development and advancement may pave the door for fresh approaches to sports game observation and support referees in reaching more precise conclusions.

1.3 Scope of Research Report

This research report aims to investigate the extent in which the introduction of the technology of video assistant refereeing (VAR) has impacted traditional football and to determine if footballing fans are satisfied with this technology. A Quantitative approach using a Qualtrics online survey was used to uncover some of the key questions such as (i) how consistent do fans think this technology is in terms of its application, use and understanding within the football context. The next element focuses on, (ii) does this technology impact the refereeing performances, mindsets, and abilities (Bar-eli, 2021)

which can lead to complacencies. Another important aspect uncovered is (iii) how well have the fans and players taken to this type of technology and its implementation from a spectator point of view, seeing the large audience base football has gained globally (Muller, Simons & Weinmaan, 2017). The last focus area is aimed at how much Video Assistant Refereeing (VAR) slows down the game play, as all VAR decisions go through many check lists before final consensus is determined. What impact does this newly introduced stop-start approach have the football fans experience.

This research report aims to unpack if football fans are satisfied with the introduction of the VAR technology by either proving or disapproving the following hypotheses based on the literature:

(i) Technology has a future in football when making officiating decisions.
(ii) The VAR technology is creating more controversy amongst football fans due to the inconsistencies associated with the process.
(iii) Slow motion replays create false narratives in the VAR replay process.
(iv) VAR technology disrupts the natural flow of the game for football fans.
(v) Football fans do not want VAR used for making refereeing decisions.

The methodology used in undertaking this research is quantitative, with the use of an online survey as a method to gain information about how video assistant refereeing (VAR) has impacted on football management for the footballing fan. This sample size was distributed using the Qualtrics online survey tool and was sent to one hundred and fifty (150) participants which were distributed to local footballing teams, supporter's clubs, social clubs, and footballing communities. A positive of fifty-six (56) responses have given their feedback which was used in this research report. VAR is a technology that local (South African) leagues and fans are not exposed to directly which makes it challenging to obtain a greater sample size which would add complete value to this research report. However, the assumption is targeting individuals who have mid to extensive footballing knowledge and watch overseas leagues were the VAR is currently active and in use would be more beneficial, therefore the targeted approach for distributing this survey was taken.

1.4 Assumptions

This research report initially started, complied, and completed between July 2022 until November 2022. All the information regarding the VAR processes and protocols in this report was subject to those timelines. Over the course of this research report, all the VAR rules and regulations have not been amended and are still as stated in this research report, nor has it been changed or by any football body to date.

Ethical clearance was granted by the Wits Business School (WBS) on the 01 September 2022 to start the collection of data for this research project. The survey was constructed on Qualtrics, shared, and distributed on the 23rd of September 2022 and was made available to participants until the cut-off date of 7th October 2022. Any other responses received after the 7th of October 2022 was not included in this research.

1.5 Limitations

Limitation or potential weaknesses of this study will come down to getting the appropriate participants to provide feedback for this research project. This technology is fairly new and complex so not all football lovely fans understand how it works and the actual impact it could have on the game. Some participants may be reluctant to click links in order to access the survey, but the appropriate steps will be taken to ensure the most positive feedback from participants as possible. Managing the quality of responses will be done by checking all raw data for any missing details and using the necessary tools on SPSS to mitigate those risks. The survey was kept as simple as possible to ensure all the respondents answer all the questions without any difficulties.

2. Literature Review

The literature review for this research report aims to cover the various aspect in which the VAR technology has an impact on football management for the spectators and fans. In today's world, all footballing clubs are best recognized as a brand with the massive amounts of revenue they bring in and its customers that are fan (Tapp, 2003). Therefore, keeping them satisfied is incredibly important. Unpacking previous work and research done by the various scholarly academics will give better insight in which can assist this research report in understanding the role that VAR technology plays in football and how this impacts all its stakeholders. The theoretical framework for this under study will comprise of the following topics to be researched. The first key highlight will look at how technology has impacted football and compare it to other sports using similar technology in decision making. Secondly, it is important to unpack how the VAR technology in particular has impacted football, also investigating the process and procedures that are followed by the VAR officials. Slow- motion reply feedback is the basis in which the VAR process makes decisions, therefore looking at previous work done on the impact of slow-motion video feedback will enable this research report to view the transparency of this technology. Research performed by Muller, Simons and Weinmaan (2017) states how popular football is worldwide, therefore the need to look at and understand the impact on this technology from a fan's perspective as the game is changing. The last aspect that will be covered in this literature review will be how much does VAR impact on the refereeing mindset and how the refereeing decision can impact on football fans. The aspects that are uncovered in the literature review will aid this research report in understanding if football fans are satisfied with the introduction of VAR in football management.

2.1. Introduction of Technology in Football

Various technologies are designed to make our lives easier (Winand & Fergusson, 2018). In this regard, the latest decision-aid-technology has been implemented in sport to help officials and referees to make the correct decisions when required (Winand & Fergusson, 2018). There are different decision-aid-technologies that are used in various sports which

include instant replays that are used in cricket, basketball, rugby, hockey, and tennis. The reason for the introduction of such technology is simply because professional sport has increased in pace and intensity, therefore officials have challenges to get decisions correctly which could have greater implications from a sporting and financial point of view for teams, individuals as well as the fans (Winand & Fergusson, 2018).

In an opposing view, footballing body, FIFA have been reluctant to bring in technologies such as Goal line Technology (GLT) and Video Assistant Refereeing (VAR) in football. The reason for this resistance is that the introduction of such technologies would take responsibilities away from the officials and slow down the game play (Zglinski, 2020). Despite this reluctance, an incident during the FIFA 2010 World Cup hosted by South Africa when a goal by England's Frank Lampard was disallowed when the ball had crossed the goal line which resulted in England missing a victory against Germany, reinforced the call for the introduction of technologies. This was one example of the many dubious decisions that footballing fans have brought to the attention of FIFA (Winand & Fergusson, 2018). Due to the high speed of play, officials do not always see everything, and pressure started to mount on FIFA and the International Football Association Board (IFAB) to look for solutions by using and implementing available technologies on the market (Winand & Fergusson, 2018). The implementation of Goal Line Technology (GLT) was introduced into football in 2012 (Winand & Fergusson, 2018). This technology was implemented using the latest in innovations which could determine if the football has fully crossed the goal line or not. A digital transmission is sent to the referee's watch informing him of the decision instantly. Some of the impediments with this technology is the fact only certain leagues can afford this innovation (Ryall 2011) and during its earlier deployment there was lack of trust in its abilities.

Even though this technology ensures fairness, some managers, teams, and supporters have shown their disapproval when moving in this direction (Winand & Fergusson, 2018). The general concern is how it affects the game's experience and their own team. In addition to these claims (Tommy & Nicolas, 2021) also mention how FIFA feels that technology undermines the game as it is not played the same way throughout the world because of resource inequality.

In similar vein, Zglinski (2020) mentions how FIFA had been pushing back on technology being introduced in football even though VAR has been a huge development in officiating. This VAR system was invented by the Royal Dutch Football Association (KNVB) to help the refereeing process (Tommy & Nicolas, 2021). After testing successfully, the International Football Association Board (IFAB) approved this technology in March of 2018 (Tommy & Nicolas, 2021). The mechanics of VAR has similar attributes of instant replay technologies that are used in sports such as cricket, basketball, tennis, and American football (Tommy & Nicolas, 2021). Zglinski (2020) also argues that with the introduction of VAR and GLT has provoked many debates with footballing fans. Technologies are in place to reduce the number of errors in decisions made, however, Collins (2010) also argues that these technological devices can create a falsified transparency. This falsified transparency tends to anger many footballing fans (Collins, 2010).

Football has been late to adopt technology unlike other sports (Zglinski, 2020). The reason for this according to Ryall (2012) is that technology is expensive and unreliable but more importantly it is the changes the simplicity and flow in the way the game of football should be played.

In agreement with the research performed by Winand & Fergusson (2018) and Zglinski (2020) that technology can change the way sport is officiated, one thing that comes to light is the feasibility of having such technology in sport (Ryall 2012) and that if not all bodies and leagues have access to these technologies, it is unfair to have them in place. It is important for an all or nothing approach, so that all footballing fans can get the same experiences. Therefore, raises the question, does technology complicate how football is being consumed by fans and is there a future to use technology (both current and new) to change the game. The hypothesis uncovered from the literature and to be prove or disprove is, “Technology does have a future in football when making officiating decisions.”

2.2. Video Assistant Referee (VAR’s) Modification of the Game

The VAR which was introduced in 2018 by IFAB also has created many stoppages in the game of football (Haugen, 2019). Football already has many stoppages such as thrown

ins, freekicks, injuries, penalties and a half time break which impacts on the flow of the game for the spectators and viewers. Having the VAR stoppage process thrown into this mixture, only further impacts the interest of its viewers (Haugen, 2019). An important aspect of the research by Haugen (2019) is the matter of fairness. Fairness is the reason for implementing and introducing such technologies in football, however the argument put forward by Haugen (2019) was that in football, these dubious decisions made by on-field referees was something all fans knew as “uncertainty of outcome”. Haugen (2019) further argues that sometimes these unfair decisions can have a positive impact on the underdog team, referencing the David and Goliath scenario, which is what makes football exciting to spectators and audiences.

The offside rule in football and how this VAR technology perceives it has become one of the most debated and disputed factors in football amongst all fans (Mather, 2020). Mather (2020) argues that in 2020 with the implementation of this technology in the English Premier League (EPL) over 34 goals were ruled offside and had to be referred or checked by the Video Assistant Referee (VAR) system. These decisions to award or disallow the goals using VAR would have impacted the mindset and attitude towards the VAR technology with fans (Mather, 2020).

The research done by Mather (2020), tends to agree with the work done by Haugen (2019) in highlighting another factor in which the game has changed since VAR has come into play which directly has an impact on the fans. Whilst the VAR uses live TV visuals when performing their reviews, there are clear limitations placed on those feeds (Mather 2020). Mather (2020) highlights two factors. Firstly, because of physical and perceptual limits on resolutions placed on the TV feed, the spatial position of the player and ball which is judged by VAR on review is several centimetres to one side of their actual positions. Second, the fact that due to the 50 Hz TV visuals being used, the time-of-contact between ball and player is roughly 10ms late and this result in an increase in attacking players being called offside (Mather 2020).

In support of Mather (2020), Ziegler (2019) also highlighted issues with the VAR system arguing that the most controversial use of this technology are marginal offside calls which

rule out goals. These decisions have also gotten the interest of the Union of European Football Association (UEFA), who have voiced an opinion by stating that some senior members at UEFA have been pushing for the review of VAR and offsides. Ziegler (2019) also mentions that due to the number of camera angles needed to judge offside calls, the Major League Soccer in the United States does not use the VAR technology for that purpose.

Having the VAR system in place, again speaks to the cost of running the technology (Ryall 2012). When the VAR operators perform their reviews on a TV visual that has some limitations, the question of implementing VAR in football for a sustainable long-term future are raised.

Another key factor when mentioning the VAR protocols is that this technology can only be used once there is a ‘clear and obvious error’ or a ‘serious missed incident’ that the on-field official had missed Zglinski (2020). Zglinski (2020) further argues that VAR would need to have the capability to relook at any decision made by the on-field official from scratch, this process is called “de novo review”. However, Zglinski (2020) concedes that this would impact the fans as much more intervention from the VAR system through the game and as a result the IFAB went with another approach that the VAR would only get involved and overturn the on-field officials’ decision if they deem it to be evidently incorrect. Zglinski (2020) also adds that this technology is merely just to function as an assistant to the on-field official who would have similar inputs as that off a linesman (officials that run the lines).

This approach to overturning decisions that are only deemed to be ‘clear and obvious’ as well as ‘serious missed incident’ takes into account the referee’s position, view and thought process during the incident. Therefore, even on replay if a decision looked to be incorrect, the refereeing factors are taken into account making the VAR system ineffective and as argued by Spitz, Moors, Wagemans, and Helsen (2018) causing uproar as fans and commentators see the officiating errors on real time footage. In cases where decisions are overturned, the officials bear the brunt of having made a mistake which can impact them psychologically (Zglinski, 2020).

It is significant for this research report to investigate whether or not the footballing fans believe that these modifications introduced by VAR are creating more fairness and consistency in the game. The hypothesis uncovered from the literature and to prove or disprove is, “The VAR technology is creating more controversy amongst football fans due to the inconsistencies associated with the process.”

2.3. Impact of slow- motion feedback during VAR process

In line with the research done by Winand and Fergusson (2018) regarding the use of different technologies used in sport, Mather, and Breivik (2020) highlights the use of slow-motion playbacks, which are commonly used in various sports such as rugby, tennis American football, are also used to perform the VAR process. When considering how VAR works, one thing that is central to the decision making is the use of slow-motion replays (Mather & Breivik, 2020). The Mather and Breivik (2020) research assesses how the rules and laws of football are applied in this instance, for example, if a player had handled the ball inside the penalty box (area), the VAR system would apply a review in determining if that action were intentional or not. Also highlighted using this process is that when looking at actions in slow-motion, it can give the viewer (VAR operator) a sense that the player would have had more time to act or avoid the ball from touching their hand (Mather & Breivik, 2020). These video playbacks are shown in this slow version to all football fans and can spark major debate amongst them.

This technology and opportunity for slow-motion replays that have been brought into the game somewhat manipulate the final decisions or the suggestions given by the VAR to the on-field official result in a game changing circumstance (Mather & Breivik, 2020). In other areas of the field, slow motion replays can also impact how perceived contact between two players can be viewed and these actions can also lead to player’s actions being seen as harmful and unfair once the incident is slowed down.

Slow-motion replays using the highest technological advancements in cameras available are a crucial factor in providing detail on the football pitch not only to the VAR system but also to the fans and commentators who can access the footage and form opinions (Spitz, Moors, Wagemans, Williams & Helsen, 2018). Spitz, Moors, Wagemans, Williams, and

Helsen (2018) add that the available footage is also used by the IFAB to rate and review how referees perform when making on the spot decisions. This research also aligned itself to the work shared by Mather and Breivik (2020) in that they share the same sentiments regarding how slow-motion replays can demonstrate a potential bias when analysing foul-play situations (Spitz, Moors, Wagemans, & Helsen, 2018). This is further elaborated in the research report with similar examples of how slow-motion replays can increase the probability of penalizing the offender with a more serious consequences such as changing the card from yellow (which is more of a warning) to red (which is a sending off and 3 match ban) (Spitz, Moors, Wagemans, & Helsen, 2018).
In support of the slow-motion theory of research performed by Mather and Breivik (2020) and Spitz, Moors, Wagemans, and Helsen (2018), an experiment was conducted by Caruso, Burns and Converse (2016) highlighting the use of slow-motion surveillance. The results from this illustrate that looking and analysing a particular action in slow-motion within professional football is more likely to display an action of more intent as compared to viewing the footage in real time.

Form the above research, there is a clear disadvantage to the offender when their actions are being viewed and reviewed in slow-motion rather than in a real time instance. These additional replays performed by the VAR system clearly add more pressure onto the officials to make decisions of what they are seeing in a slowed down version of the events. This added pressure is also accumulated from the fact these replays are also viewed and opinionated by fans and commentators who have access to the footage instantly as stated in the research by Spitz, Moors, Wagemans, and Helsen (2018). This research report investigates whether football fans believe that decisions based on instant replay reviews are benefitting the games play. The hypothesis uncovered from the literature and to prove or disprove is, “Slow motion replays create false narratives in the VAR replay process.”

2.4. Video Assistant Referee (VAR) from a Fans view

In the business of football and a managerial viewpoint, one of the important things to consider is how are the fans experience impacted by the VAR technology and its use (Tommy & Nicolas, 2021). Whilst conducting their research (Tommy & Nicolas, 2021) on

the perspective of VAR within the EPL, they showed that the majority of fans were happy with the Video Assistant Referee (VAR) technology when decisions went their team's way. However, they expressed that how this technology is used to assist the on-field referee can be modified and improved upon (Tommy & Nicolas, 2021). A key factor in their research also pertained to the amount of time decisions were made and finalized. Fans within the stadiums tend to feel the time being longer when attending matches in stadiums without TV screens or monitors in place (Tommy & Nicolas, 2021). This view of the technology introducing more stoppages is aligned with the research done by Haugen (2019). These factors also tend to cause a lot of confusion amongst the fans. As the Video Assistant Referee becomes a part of the norm of football, fans inside these stadiums with TV screens around would be more understanding of this process as opposed to fans in stadiums without screens (Tommy & Nicolas, 2021). These elements are highlighted as being a fear that in future, fans will become more reluctant to attend live football matches and this in itself could have another huge negative economic impact brought about by this technology and how it is being implemented.

To understand the fan's perspectives of Video Assistant Referee (VAR), it is game and incident dependent. As justified by Winand, Schneiders, Merten and Marlier (2021) and Tommy and Nicolas (2021) who explain that when the Video Assistant Referee (VAR) overturns an on-field referee's decision in favour of a set of fans, they will tend to be in favour of the technology. The opposite can be said also if the decisions go against the fans desires, they will see Video Assistant Referee (VAR) as something negative (Winand, Schneiders, Merten & Marlier, 2021).

Footballing debating from fans arguing football controversial decisions have always been part of the game (Winand, Schneiders, Merten & Marlier, 2021). Some of the Issues that keep fans engaged with each other debating fouls, penalties, red cards, and offside calls and to some extent the Video Assistant Referee (VAR) removes these elements but can also add other factors such as consistencies in its application. In 2010 then FIFA president Sepp Blatter mentioned that debating amongst fans are critical for fan satisfaction. These are the reasons which was also highlighted in the studies done by Winand and Fergusson (2018) when mentioning FIFA's reluctance to bring in technology in the game.

The research views given above agree that fans that sit in stadiums without understanding fully why the game has been stopped or decision is pending can be a very frustrating experience (Griggs & McGillick, 2022). The experience of being 'in the dark,' accuracy as well as ruining a football moment for fans are the common themes associated with the VAR technology and process (Griggs & McGillick, 2022).

These themes of frustration stated by Griggs and McGillick (2022), were also stated in the research of Winand, Schneiders, Merten and Marlier (2021) when they highlighted fans frustrations during a friendly match in 2017 between France and Spain when a Video Assistant Referee (VAR) decision had overturned a France goal only after players and fans started to celebrate their goal. This also contributes to the technology taking away the natural passion out of the game , since every decision or moment can be overshadowed by the Video Assistant Referee (VAR) system. Even though the decisions made were correct, it is a good example how Video Assistant Referee (VAR) technology can change the atmosphere within a stadium amongst the fans (Winand, Schneiders, Merten & Marlier, 2021).

In addition to this research report of fans perspectives, decision that become overturned by Video Assistance Referee (VAR) could also give fans less confidence in the remaining abilities of the on-field referee (Similar views by Zglinski, 2020). This lack of trust will then lead to scrutinizing each decision from a fan's perspective contributing to a very hostile stadium atmosphere.

This research report aims to investigate what experience VAR has on football fans. The hypothesis uncovered from the literature and to prove or disprove is, "VAR technology disrupts the natural flow of the game for football fans."

2.5. Video Assistant Referee (VAR) from a Referees view

When performing refereeing duties, it is important that trust is established between the referee, players, and the fans (Zhiliang, 2021). The introduction of the Video Assistant Referee (VAR) system was aimed to build that trust (Zhiliang, 2021). Despite the mentioned benefits of the VAR technology, there are limitations while using such

technologies which include the timing of the actual Video Assistant Referee (VAR). The review of some incidents can take much longer than expected and the entire process operation is not exactly standardized (Zhiliang, 2021). A key mention in the Zhiliang (2021) research is that referees are becoming more reliant on the Video Assistant Referee (VAR) to make decisions. Some of these decisions while using the technology still need human interpretation. Zhiliang (2021) also states that some decisions are still wrong even after the review which creates animosity with fans.

Samuel, Galily, Filho, Tenenbaum (2020) argue that the introduction of the Video Assistant Referee (VAR) within football has been a "technical-technological career change event" for referees. Some of these changes have impacted the referee's players management, pre-match routines, decision making abilities and public perception from fans (Zglinski 2020). In addition to these attributes, Samuel, Galily, Filho, Tenenbaum (2020) state that extra training and knowledge sharing sessions with other officials were needed to be learned to understand the Video Assistant Referee (VAR) system.

In addition, the Samuel, Galily, Filho and Tenenbaum (2020) study shows that the Video Assistant Referee (VAR) system conducts checks behind the scenes in silence. In instances where potential mistakes are found, they will communicate with the on-field official who can perform two actions, namely:

(i) Alter the original decision from the information provided by Video Assistant Referee (VAR), or

(ii) Perform an on-field review (OFR) at a pitch side monitor, where they review the events and could decide to overturn their original decision if it was incorrect.

Samuel, Galily, Filho, and Tenenbaum (2020) together with Zhiliang (2021) argue that referees have become more reliant on the Video Assistant Referee (VAR) technology. This technology also makes them second guest themselves since they are afraid their original decisions could be overturned and can be deemed as incapable by the fans in performing their duties.

The VAR process is a critical function for the officiating and therefore relevant to determining the impact it has on footballing matches and the fans experience. This report investigates whether football fans believe that having the VAR technology available in matches for the referees are the best way to obtain the correct outcome or decision in its current form and use. The hypothesis uncovered from the literature and to be prove or disprove is, “Football fans do not want VAR used for making refereeing decisions.”

2.6. Summary

Football is the biggest sport in the world with billions of fans and players. As much as this is a huge positive for the sport, this also brings about many different opinions and views of the game and how it should be played and developed. The introduction of Video Assistant Referee (VAR) in football is something that, at the time of implementation needed to be done due the fact that the game had increased in pace and complexity as well as pressure from the fans for FIFA to deliver a solution for poor decision making. In order for referees to keep up with these demands, huge interventions were needed as refereeing decisions could make or break a team with major financial implications and alter the footballing fans experiences.

Whilst the International Football Association Board (IFAB) has supported Video Assistant Referee (VAR) and its use in order to ensure that football justice prevails, the implementation of the technology has had mixed views of acceptance amongst the footballing communities. Some of the issues as highlighted in the literature review come down to how much this technology has impacted the way football is being played. This technology takes out some controversial decisions which were always part of this beautiful game and the timing in which decisions taken can lead to frustrations amongst the players, fans, and teams. The other aspect of this technology is that its purpose is to support the on-field referee and only intervene if there is a “clear and obvious error” or a “seriously missed incident.” The statement of “clear and obvious error” together with a seriously missed incident can sometime be a very vague instruction and evidence has shown these terminologies vary in interpretation from referee to referee and from match to match. Key aspects highlighted in the literature also affect the reliability and excessive

costs of this technology. This technology is not sustainable to all leagues in the world, making the football format different which is what FIFA disliked about bringing this to the fore.

Video Assistant Referee (VAR) also puts on-field referee on the spot when decisions are made incorrectly by them, which can have serious psychological impacts of their abilities and judgements for the remaining of the game. Change can be good and is inevitable, however, is the technology a step too far in the footballing community and how satisfied are footballing fan with the implementation of VAR in football and do they believe it has a future in the game. Proving or disproving the various hypotheses which were identified during the literature review, will aid this research report, and give it a meaningful based to understand the impact that the VAR technology has on footballing fans.

3. Methodology

3.1. Research Paradigms

This research report using a Positivism research paradigm. The ability to evaluate the hypotheses given in this research report which is related to the satisfaction levels of football fans feelings and beliefs towards the VAR technology in football, can be measured by their individual experiences. Each football fan will have an opinion and view about how the VAR technology and its implementation in football has impact their views of the way football has changed. The results of their responses are used to prove the hypotheses in relation to the satisfaction indication of the VAR technology for football fans.

3.2. Research Design

Through a quantitative methodology, a series of questions aimed at football fans was designed to get an overall view of how satisfied football fans are towards the VAR technology. Based on the literature and problem statement, this research report aims to prove/disprove the following hypotheses:

(i) Technology has a future in football when making officiating decisions.
(ii) The VAR technology is creating more controversy amongst football fans due to the inconsistencies associated with the process.
(iii) Slow motion replays create false narratives in the VAR replay process.
(iv) VAR technology disrupts the natural flow of the game for football fans.
(v) Football fans do not want VAR used for making refereeing decisions.

These survey questions asked to the participants were split into four categories as follows:

- **Profile of participants** : this category is used to find out as much as possible of our participants and gage their footballing knowledge, the frequency of them watching football on a monthly basis and how often too they watch football. This

ensured that the correct sample size participants were selected to help assist and understand our hypotheses regarding the VAR technology in football.

- **Identification**: This category was to understand how enthusiastic the participant was about football. Questions such as how much enjoyment they get from watching their favourite team play; how emotional they get in the good and bad moments helped identify the enthusiastic levels each participant had.
- **Satisfaction** : This category was to understand how the participants felt towards the VAR technology and process in football. The addition of an interchangeable questions was introduced in this part of the survey to get their true feelings. Asked how satisfied they felt the VAR and the process is as well as issues of consistency were critical in discovering possible links within this research.
- **Technology in Sport**: in this section, the survey focussed on technology in sport and how the participant felt towards technology being used for officiating decisions. The purpose is to investigate if there was a link towards the feeling of technology in sport and the current VAR process.

3.3. Data Collection

In order to gain the best results and views for this research report, a quantitative approach was followed. The methodology used for collecting important data included an online survey to get the best insights to the thoughts and views regarding the topic of Video Assistant Referee (VAR) in football. The advantages of this online survey approach are that it allowed for a larger and more diverse target audience that was reached whilst breaking down their exact thoughts to help the research project. This research report compared the participants responses with the different variables, match, and group them together to help understand the sample sizes feelings towards VAR. The implementation of Video Assistant Referee (VAR) in football is a fairly modern technology in football and not all people really understand how it works, therefore capturing people who can add value and are knowledgeable with the rules and implications to this subject added value.

3.4. Population

The selection of population was done based on the facts that targeted communities who have a passion for football was chosen. The risk with asking non-footballing fans with little or no knowledge of the game will not add much value to this research report. Therefore, this survey was distributed to footballing communities such as, local, and international football supporters' clubs, local footballing arenas, and sporting centres to ensure people who have a passion for football and sport interested in answering the survey.

3.5. Sampling

The targeted estimated sample size for this research was 150 people through anonymous email links, direct emails from Qualtrics, and thought social media platforms. The minimum age group considered for this survey was 18 years old and maximum age was 65 years old.

3.6. Reliability

Reliability of the sample population was managed by ensuring the online survey was distributed to local football clubs, such as the coaches, players, backroom staff as well as local footballing supporters' clubs (football fans associations). This helped the research report results to remain as accurate as possible whilst conducting the results for our hypotheses questions. The analytics tool SPSS was used to take all the survey results and analyse the results. All three categories have a strong Cronbach's Alpha of greater than 0.65 scoring which indicate a good model from the analysis in section 4.4 of the reliability analysis.

4. Analysis and Results

4.1. Profile of participants

A total number of fifty-six participants responded in this research survey. The initial sample size was 150 participants which gives us a 37.33% success rate. Table 1 below shows the profile of our sample population giving us a fair indication of their age group, experience, and frequency of how often they have been supporting their teams and how much they watched football monthly.

Gender of participants	Number of participants (N- 56)	Percentage (%)
Male	37	66
Female	16	28.57
Do not wish to answer	3	5.36
Age group of participants		
18-25	3	5.36
26-35	15	26.79
36-49	31	55.36
50-65	7	12.50
How many years have you watched football?		
0-1	5	8.93
2-3	12	21.43
4-6	10	17.86
7-9	16	28.57
10 or more	13	23.21
How many times do you watch the team/s you support?		
1-3	8	14.29
4-6	16	28.57
7-8	15	26.79
9 or more	17	30.36

Table 1: Profile of participants (N = 56)

The largest percentage of age group for this sample as shown in *Table 1*, is that 55.36% of the research sample were between the ages of 36 and 49. This population sample is also very experienced and shows that there is a high frequency of how many years they support their teams and watch the sport. 28.57% of this population has watched football between 7-9 years as shown in *Table 1*. The benefit of having a population with such keen interest can help to get a true understanding of how the footballing fans view the VAR technology and its impact in football management.

4.2. Descriptive Analysis

A scale rating was used for the following categories which include (i) Identification, (ii) Satisfaction and (iii) Attitude towards technology being implemented in sport. The following/below rating were used in the survey:

1 = Strongly Disagree,
2 = Disagree,
3 = Neither Agree nor Disagree,
4 = Agree,
5 = Strongly Agree

(i) Identification of participants

Identification of participant	Mean	Standard Deviation	Variance	Count
ID1- I enjoy watching and supporting my team.	4.41	.654	.428	56
ID 2- I dislike my teams rivals.	3.45	1.008	1.015	56
ID 3- I have strong emotions towards my team.	3.68	9.74	.949	56
ID4- I do not enjoy when my team is criticized.	3.62	.949	.893	56
ID 5- I enjoy when my team is given praise.	3.84	.910	.828	56
ID6- I feel proud when my team does well.	4.13	.764	.584	56

Table 2: Identification of participants

This category of survey questions related to the identification of the population sample. It was important in this study to ensure that the research report has the correct sample who enjoy watching football and are invested emotionally in this sport. As a result, *Table 2* shows that the population sample really enjoy watching football with the highest mean of 4.41 (ID1) and they also feel immensely proud when their teams do well (ID6) with the second highest mean of 4.13. These category supports the assumption together with their standard deviations being the lowest which indicates there is a high sense of agreement towards the questions around identification of the participants. The lowest mean around the identification of 3.45 which was ID 2, relates to the participants disliking their teams rival, which could mean that this population sample is more interested in their own teams' success rather than its opponents. The Standard Deviation for ID2 was also the highest, which means there was a larger variance amongst the population samples response to this variable.

(ii) Satisfaction of VAR technology

Satisfaction of VAR technology	Mean	Standard Deviation	Variance	Count
SAT 1- VAR interrupts the games natural flow.	4.39	.755	.570	56
SAT 2- I am satisfied with the current VAR process.	2.00	.953	.909	56
SAT 3- I do not trust the current VAR process.	3.93	1,042	1.086	56
SAT 4- I would like VAR to be used in all football competitions.	3.84	.968	.937	56
SAT 5- VAR enhances the atmosphere.	3.68	1.029	1.058	56
SAT 6- I am in favour of instant replays.	3.91	1.049	1.101	56
SAT 7- VAR has potential to provide more fairness.	4.55	.570	.324	56
SAT 8- There is no consistency in decision making when using VAR currently.	4.64	.616	.379	56
SAT 9 - VAR has a place in football.	4.32	.765	.586	56

Table 3: Satisfaction of VAR technology

The Satisfaction of VAR technology category survey questions was aimed at understanding how the sample population of football fans feel towards the VAR technology and the impact it has had on how they view football matches and its management. Stats shown from *Table 3* highlights that the highest mean in terms of agreement is SAT8 which is 4.64 and this relates to the lack of consistency in decision making when the use of VAR comes into play. Another interesting observation from the data in *table 3*, is that the lowest mean is 2.00 which belongs to SAT 2 and relates to whether the population are satisfied with the current VAR process. Clearly this SAT 2 state indicates a low satisfaction rate amongst this population sample. However, despite

results from SAT 8 and SAT 2, this population believe that there is a future for this technology by looking at SAT 7 (mean of 4.55) which speaks about the VAR technology having potential to provide fairness as well as SAT 9 (mean of 4.32) which relates to this technology having a future in football. This sample population of football fans believe they in its current form and use, they are not happy with VAR, however, there is enormous potential for the VAR technology if certain processes change.

(iii) Attitude towards technology in sport

Technology in sport	Mean	Standard Deviation	Variance	Count
TECH 1- Technology used for officiating decisions making in sport ensures more fairness.	4.25	.769	.591	56
TECH 2- Technology used for officiating decisions are better than human judgement.	3.80	.818	.670	56
TECH 3- Instant replays assist the referees to make better decisions.	3.75	.958	.918	56
TECH 4- I am satisfied with having technology in sport.	3.93	.931	.868	56

Table 4: Attitude towards technology in sport

In this category, the survey was aimed at understanding how the sample population felt towards technology in sport in general. The highest mean of 4.25 together with the lowest Standard Deviation of .769 was TECH 1, in which was a question asked about how they feel about technology being used for officiating decisions to ensure more fairness. A large number of the sample population believes that technology used for officiating decisions brings more fairness however, the least favoured mean was TECH 3 with a mean of 3.75 and a Standard Deviation of .958, in which they feel instant replays do not really do justice in making better decisions. Since the VAR technology uses instant replays to assist throughout the ensure process of decisions making, this could be the reason as to why many people are unhappy about how VAR is being used in football management.

4.3. Correlation Matrix

This section aims to investigate the correlation between each variable within the different sets of categories. Identifying the highest and lowest correlations in the matrix is important to identify the relationship each variable has with each other. The closer to the score of 1.000, will assist this report to indicate a close relationship this sample population has between the different variables.

Inter-Item Correlation Matrix

	ID1 - I enjoy watching and supporting my team	ID 2 - I dislike my teams rivals	ID 3- I have strong emotions towards my team	ID 4 - I do not enjoy when my team is criticized	ID 5 - i enjoy when my team is given praise	ID 6- I feel proud when my team does well
ID1 - I enjoy watching and supporting my team	1.000	.517	.439	.342	.327	.550
ID 2 - I dislike my teams rivals	.517	1.000	.612	.389	.357	.469
ID 3- I have strong emotions towards my team	.439	.612	1.000	.538	.433	.641
ID 4 - I do not enjoy when my team is criticized	.342	.389	.538	1.000	.732	.670
ID 5 - i enjoy when my team is given praise	.327	.357	.433	.732	1.000	.709
ID 6- I feel proud when my team does well	.550	.469	.641	.670	.709	1.000

Table 5: Inter- item Correlation Matrix: Identification

The inter-item correlation matrix within the Identification category (*table 5*), displays the highest correlation between ID 4 and ID 5. The correlation between them is .732 which can be viewed as this population sample enjoying when their team is given praise as well as they do not like it when their team is criticized. This sample population are an immensely proud group based on the strong correlation matrix data between ID 4 and ID 5. There are not negatively correlations within this sample population. The weakest correlation is between ID1 and ID 5, which can mean that the sample population just like watching football and they do not necessarily seek praise about their own team/s.

Inter-Item Correlation Matrix

	TECH 1 - Technology used for officiating decision making in sport ensures more fairness	TECH 2 - Technology used for officiating decisions are better than human judgement	TECH 3 - Instant replays assist the referee to make better decisions	TECH 4 - I am satisfied with having technology in sport
TECH 1 - Technology used for officiating decision making in sport ensures more fairness	1.000	.397	.234	.482
TECH 2 - Technology used for officiating decisions are better than human judgement	.397	1.000	.330	.458
TECH 3 - Instant replays assist the referee to make better decisions	.234	.330	1.000	.632
TECH 4 - I am satisfied with having technology in sport	.482	.458	.632	1.000

Table 6: Inter- item Correlation Matrix: Technology

The strongest inter-item correlation in this category is between TECH 3 and TECH 4. The data in *table 6* shows that they share a .632 score. These questions relate to the understanding that this sample population believe that instant replays help referees make better decisions and that having technology placed in sport is not a terrible thing. The weakest correlation is between TECH 1 and TECH 3 with a score of .234. Even though TECH 3 and TECH 4 are talking about satisfaction of having technology in sport, the downside of using instant replays are that decisions can be made more unfairly according to what the sample population believe.

4.4. Reliability Analysis

It is important that all statistical data goes through a reliability test. The reliability test was performed on all three categories and Cronbach's Alpha > .65 is a good indicator of a strong model. *Table 8* relates to Identification, has a Cronbach Alpha of .864. *Table 9* relates to Satisfaction, has a Cronbach Alpha of .663. *Table 10* relates to attitude towards technology in sport and has a Cronbach Alpha of .745. All three categories have a strong Cronbach's Alpha of greater than 0.65 scoring can be found which indicate the data is highly dependable.

Table 8: Reliability Scale – Identification

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.859	.864	6

Table 9: Reliability Scale – Satisfaction

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.640	.663	9

Table 10: Reliability Scale – Technology

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.747	.745	4

4.5. Relationship Map – Satisfaction of the VAR technology

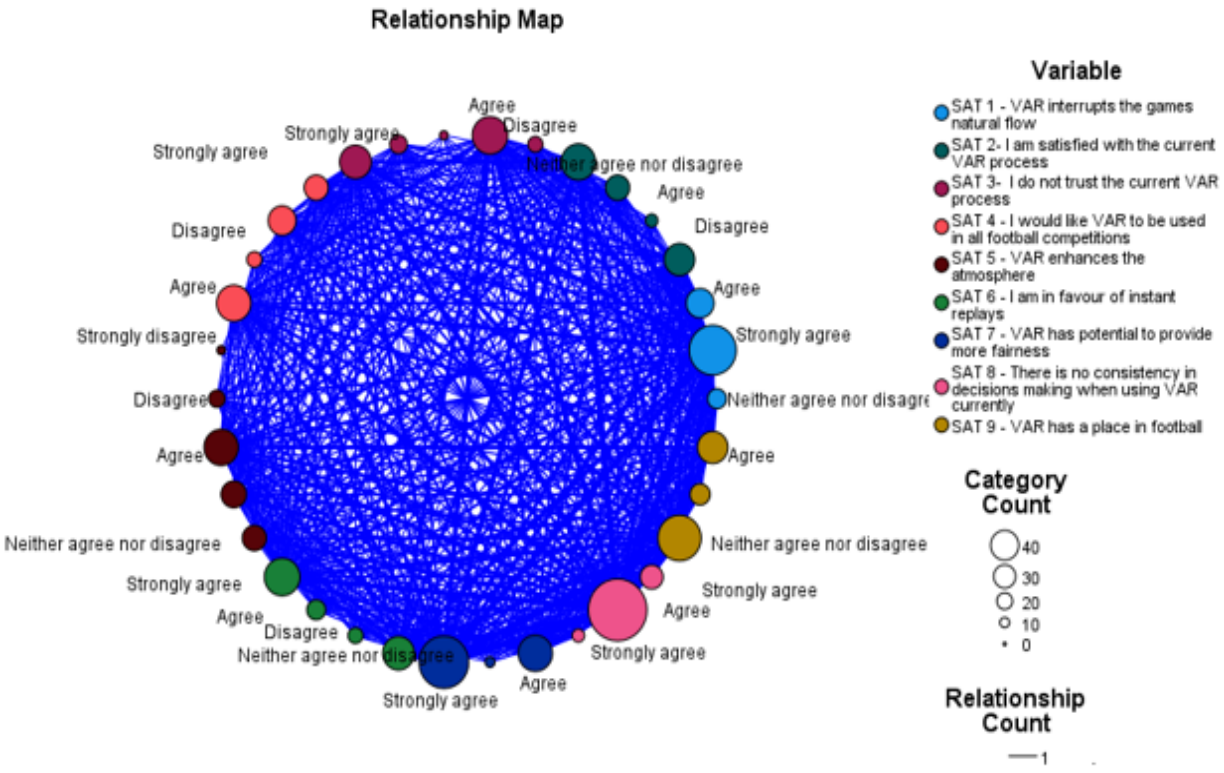


Table 11: Relationship Map – Satisfaction

Stats from *Table 11* displays the relationship within the satisfaction category. The largest variable that the sample population had in common was they strongly agreed that there is no consistency in the VAR technology and second attribute which they also had in common was that the VAR technology interrupts the games natural flow.

4.6. Conclusion

This research was aimed to assess how the video assistant referee (VAR) impacts the management of football matches and the satisfaction that football fans have from this technology. Overall results have shown that there is a clear relationship between the methodology results as well as the literature review on the impact that VAR in football management has on football fans. This sample population shows a 37.33% positive response rate of participants with a good mixture of both male and female respondents. The age category is also very mature with the highest percentage being 55.36% related to 36–49-year-olds. It was important that this research gets participants who watch and engage in football related matters with a high frequency and the stats as shown in *Table 1. Table 1* also indicates that about 30.36% of our sample population watches football 9 or more times a month.

The overall research findings result show that the hypotheses identified in the literature review as well as the research design can be concluded as follows:

Hypothesis (i) Technology has a future in football when making officiating decisions – this can be proven from the above research and results as TECH1 (4.25) in the technology category explains that this sample population have a strong acceptance that technology used for officiating decisions creates more fairness and has a future when it comes to football. However, a crucial factor to consider is most of this population still do not trust the current VAR process which has a low score in SAT3 (3.93) but also believe VAR has a place in football SAT9 (4.32) and can potentially provide more fairness in SAT7 (4.55).

Hypothesis (ii) The VAR technology is creating more controversy amongst football fans due to the inconsistencies associated with the process – this can be proven based on the observations from sample population as it is the highest Mean in the satisfaction category

with 4.64 as well as the lowest variance of .379 is SAT8. This indicates most of the sample population lean towards strongly agreeing that this VAR technology brings in a massive element of inconsistency during the process.

Hypothesis (iii) Slow motion replays create false narratives in the VAR replay process – based on results from sample population, this can be proven. In the technology category of TECH3 has the lowest score of 3.75 in relation to whether they believe that instant replays actually assist the referees make better decisions. This strong disagreement indicates the sample population do in fact believe that slow motion replay and feedback to the officials actually hampers their abilities to make better decisions.

Hypothesis (iv) VAR technology disrupts the natural flow of the game for football fans – this can be proven in the research report. This sample population result show two crucial factors that prove this hypothesis. SAT1 (4.39) which explains a highly agreement towards how much VAR interrupts the natural flow and SAT5 (3.68) which speaks to how little VAR actually plays a role in improving the atmosphere. These scoring areas indicate that football fans believe that the VAR technology has impacted their experience negatively.

Hypothesis (v) Football fans do not want VAR used for making refereeing decisions – this hypothesis cannot be proven from the results as it is unclear. SAT9 states that a high percentage of this sample population do believe that VAR has a place in football, and this can be complimented by SAT 7 (4.55) which indicates this technology has a place in football. This population see the merit in the technology, but certain processes need to be changed.

Based on the literature, results and hypotheses in question, a conclusion can be drawn up that, based on this current population sample, majority of football fan are not entirely satisfied with how the current process and protocols for the VAR technology is being managed in football matches. There is enormous potential for this technology to be more widely accepted into the football communities, however, there needs to be major changes in order for this to take place.

5. Recommendations

Based on the researched literature and the methodology performed above, in its current form and process, the VAR technology has created much controversy within the industry as well as amongst the fans. If additional processes are altered, it can bridge the gap between traditional football and bringing in technology to keep up with the times.

There are a few recommendations that can be highlighted to ensure that the VAR technology find a positive place in the management of football matches. Some of these recommendations are:

5.1. Increase live communication amongst the officials.

One of the major aspects with the VAR technology is the frustration from fans not knowing what is going on when the VAR process takes place as mentioned in the Tommy and Nicolas, (2021) research. Therefore, having the referees' conversations heard throughout the stadium, as well as on live television can illuminate the confusion or doubt factors. The fans and management can hear and understand exactly what the referees are looking at through their live conversations and understand why they think and feel certain decisions should be made and taken forward. This open form of communication, similar to what happens in rugby, can work in footballing matches, and should be considered as part of increasing the benefits of such technology.

If FIFA tend to go through this route, the on-field officials and in studio VAR panel can have conversations as the match goes on to illuminate the feeling from fans that an incident was not taken into account as the game plays on. This will also ensure minimal stoppages which was some of the issues with VAR as mentioned by Haugen (2019).

5.2. Post-match interviews from officials

An important change would be to have the referees come out and give a post-match interview would be great for the understanding and insight as to why certain decisions were given or not. As highlighted by Samuel, Galily, Filho and Tenenbaum (2020),

referees are using the VAR technology increasingly and are second guessing themselves. Having these interviews after the matches can give fans a true first hand understanding about the thought process during the referee decision. This can take away the doubts created inside the heads of footballing fans and illuminate frustrations.

5.3. Use less slow-motion playbacks when making decisions.

The major aspect of the VAR technology is its use in making decisions in slow-motion replay feedback. As highlighted by Mather and Breivik (2020) the VAR officials reviewing the incident, will have the perception that they player who caused the infringement would have had more time than they actually had but this is not the case when viewing it in real time. Therefore, a recommendation to create fairness to all parties involved is that a consideration for real time play or a hybrid approach must be taking into account when making the final decisions. This theory is also aligned with the thinking of Caruso, Burns and Converse (2016) when they mention that slow-motion replay tends to add more intent as compared to viewing footage in real time.

5.4. Fair evaluation system in place for officials

A referee panel needs to be created and shared with the public about how well a referee and VAR operations team had performed during a match. These ratings must be made and shared throughout the season and in the event of consistency in poor refereeing, actions must be taking to that referee or team such as additional training, development, and accountability as the refereeing decisions can have major impact on the team or individual who has been wronged (Marcio, Consta, Felipe, Rodrigo & Felipe, 2021).

Having such a system in place that is visible to all to see, can create a presidency for referees to ensure they are even more accurate and consistent. This table or rating system can also be used to ensure the bigger games such as cup finals or extraordinary events such as world cups, will have the best of the best only. Football fans will then feel more at ease knowing the officials are held accountable for their actions and decisions in the public eye.

5.5. Relook at the VAR panel operators and representation.

The actual panel selected are all ex-referees or current referees which alternate roles for each game. One way to bring an outside perspective and an alternative view in making decisions is to appoint ex-professional footballers. Having people who played the game and understand what goes on as a player, could help benefit the players in situations where decisions need to be made on opinionated scenarios. This will also take out the factor that referees stick together and will support one another because the VAR operator role is rotational amongst each other.

5.6. VAR process of intervention

The current VAR process disrupts the natural flow of game since officials need to bring the play to a complete stop when looking and relooking at an incident. More responsibility should be taken by the VAR panel if they feel the on -field referee has made an error and change the give them full authority to change a decision instead of the backwards and forwards communication, which can take up much time. Similar to cricket when the 3rd umpire is called into play, they make decisions based on the use of technology and are given that responsibility to ensure fairness is at the forefront.

6. References

- Caruso, E., Burns .Z ., & Converse .B., 2016. Slow motion increases perceived intent. Research article: Psychological and Cognitive science. 113(33). pp 9250-9255. Retrieved from: https://doi.org/10.1073/pnas.1603865113
- Chandler, T., 2021. Puddings, Bullies, and Squashes: Early Public School Football Codes. Sport History Review, 52(1), pp.135-136.
- Griggs, G., & McGillick, C., 2022. It's not football anymore: Perception of the video assistant referee by English premier league football fans. Retrieved from: 'It's not football anymore': perceptions of the video assistant referee by english premier league football fans: Soccer & Society: Vol 23, No 8 (tandfonline.com)
- Haugen, K., 2019. Video-Assisted Refereeing in Association Football – Possible Adverse Effect on Uncertainty of outcome. Vol. 01. Retrieved from: Video assisted refereeing in association football - possible adverse effects on uncertainty of outcome | Haugen | OA Journal - Sports (enpress-publisher.com)
- Kolbinger, O., and Knopp, M., 2020. Video kills the sentiment- Exploring fans reception of the video assistant referee in the English premier league using Twitter data. Retrieved from: Video kills the sentiment—Exploring fans' reception of the video assistant referee in the English premier league using Twitter data | PLOS ONE
- Lex, H., Essig, K., Knoblauch, A. and Schack, T., 2015. Cognitive representations and cognitive processing of team-specific tactics in soccer. PloS one, 10(2), p.e0118219.
- Marcio, O., Consta, A. , Felipe, D., Rodrigo, S., & Felipe, M. (2021). VAR implementation and soccer team performance: a comparison between the 2014 and 2018 World cups. Scholarly Journal. Vol 21. Retrieved from: VAR implementation and soccer team performance: a comparison between the 2014 and 2018 World Cups - ProQuest

- Mather, G., 2020. A Step to VAR: The Vision Science of Offside calls by Video Assistant Referees. Pp. 1371-1374. Retrieved from: https://doi.org/10.1177/0301006620972006
- Mather, G., & Breivik, S., 2020. Is the perception of intent by association football officials influenced by video playback speed?. Retrieved from: https://doi.org/10.1098/rsos.192026
- Muller, O., Simons, A., Weinmann, M., 2017. Beyond crowd judgments: Data-driven estimation of market value in association football. Scholarly Journal. Vol 263. Retrieved from: Beyond crowd judgments: Data-driven estimation of market value in association football - ScienceDirect
- Pifer, N., Wang, Y., Scremin, G., Pitts, B., & Zhang, J., 2018. Contemporary global football industry. Retrieved from: The Global Football Industry: Marketing Perspectives - Google Books
- Ryall. E., 2012. Are there any good arguments against Goal- Line Technology? pp439-450. Retrieved from: Are there any Good Arguments Against Goal-Line Technology: Sport, Ethics and Philosophy: Vol 6, No 4 (tandfonline.com)
- Samuel, R., Galily, Y., Filho, E., & Tenenbaum, G., 2020. Implementation of the Video Assistant Referee (VAR) as a career changing- event: the Israeli Premier League Case Study. Frontiers in Psychology. Vol.11. Retrieved from: https://doi.org/10.3389/fpsyg.2020.564855
- Solberg, H., & Gratton, C., 2014. Broadcasting the World Cup. Pp 47-62. Retrieved from: Broadcasting the World Cup | SpringerLink
- Spitz, J., Put, K. , Wagemans, J., Williams, A & Helsen, W., 2017. Does slow motion impact on the perception of foul play in football. pp 728-756. Retrieved from: https://doi.org/10.1080/17461391.2017.1304580
- Spitz, J., Moors, P. , Wagemans, J., & Helsen, W., 2018. The impact of video speed on the decision-making process of sports officials. Cognitive Research. Retrieved from: https://doi.org/10.1186/s41235-018-0105-8
- Tapp, A., 2003. The loyalty of football fans – We'll support you even more?. Retrieved from The loyalty of football fans — We'll support you evermore? | SpringerLink

- Tamir, I., & Bar-eli, M., 2021. The moral gatekeeper: Soccer and Technology, the case of Video Assistant Referee (VAR). Retrieved from: https://doi.org/10.3389/fpsyg.2020.613469
- Winand, M., Schneiders, C., Merten, S. and Marlier, M., 2021. Sports fans and innovation: An analysis of football fans' satisfaction with video assistant refereeing through social identity and argumentative theories. Journal of Business Research, 136, pp.99-109.
- Zglinski, J., 2020. Rules, Standards, and the Video Assistant Referee in Football. pp 3-19. Retrieved from: Full article: Rules, Standards, and the Video Assistant Referee in Football (wits.ac.za)
- Zhiliang, J., 2021. A Study on the application of Video Assistant Referee (VAR) technology in Chinese Football Professional League. Vol. 292. Retrieved from: A Study on the Application of Video Assistant Referee (VAR) Technology in Chinese Football Professional League - ProQuest

Appendix 1 – Survey Questionnaire

Profile of participant Category

- Please state your gender.
- Please state your age group.
- How many years have you watched football?
- How many times a month do you watch the team/s you support?

Identification Category – Scale rating based.

- I enjoy watching and supporting my team.
- I dislike my team's rival.
- I have strong emotions towards my team.
- I do not enjoy when my team is criticized.
- I enjoy when my team is given praise.
- I feel proud when my team does well.

Satisfaction Category – Scale rating based.

- VAR interrupts the games natural flow.
- I am satisfied with the current VAR process.
- I do not trust the current VAR process.
- I would like VAR to be used in all football competitions.
- VAR enhances the atmosphere.
- I am in favour of instant replays.
- VAR has potential to provide more fairness.
- There is no consistency in decision making when using VAR currently.
- VAR has a place in football.

Attitude towards technology in sport Category – Scale rating based.

- Technology used for officiating decision making in sport ensures more fairness.
- Technology used for officiating decisions are better than human judgement.
- Instant replays assist referee to make better decisions.
- I am satisfied with having technology in sport.

Appendix 2- Consistency Matrix

Sub-problem	Literature Review	Hypotheses or propositions or questions	Source of data	Analysis
Taking responsibility away from on-field Referee	• Winand and Fergusson (2018) • Samuel, Galily, Filho and Tenenbaum (2020) • Zglinski (2020)	1. an opposing view, FIFA (Federation Internationale de Football Association) were always reluctant to bring in technologies such as Goal line Technology (GLT) and Video Assistant Refereeing (VAR) in football. The reason for this was by introducing such technologies this would then take responsibilities away from the officials and slows down the game play. 2. introducing Video Assistant Referee (VAR) within football has been a "technical-technological career change event" for referees. 3. In cases where decisions are overturned, the officials must bear the brunt of having made a mistake which can impact them psychologically	Interviews with local referees about the perception about this technology and how it would impact them if brought to SA	To understand this problem, we will analyse the various literature on how the referee feels about this technology and its introduction.
The Video Assistant Referee (VAR) experience is not implemented in all football league,	• Ryall (2012)	1. technology is expensive and unreliable but more importantly it would change the simplicity and flow of how we know the game of football to be played at 2. Having the Video Assistant referee (VAR) system in place, again speaks to cost of running technology	Using data from FIFA and the IFAB to understand the costing of this technology in order for it to be sustainable in all leagues	Performing a feasibility study regarding the cost of having this technology in more league, together with its reliability in the use of football
Impacting the games experience for fans	• Winand and Fergusson (2018) • Haugen (2019) • Tommy and Nicolas (2021)	1. some managers, teams, and supporters have shown their disapproval when moving in this direction. 2. introduced many more stoppages in the game of football. 3. majority of fans are happy with the Video Assistant Referee (VAR) technology; however, they have expressed that this technology and how it is used to assist the	Perform interviews to get views from fan, players, and managers about this technological impact	Use information gained from footballing communities experience to understand this impact

Sub-problem	Literature Review	Hypotheses or propositions or questions	Source of data	Analysis
		on-field referee can be modified and improved upon		
Effective only when a “clear and obvious error” or a “seriously missed incident” takes place	• Spitz, Moors, Wagemans, and Helsen (2018)	1. overturning decisions that are only deemed to be ‘clear and obvious’ as well as ‘serious missed incident’ takes into account the referee’s position, view and thought process during the incident, therefore even on replay if a decision looked to be incorrect, the refereeing factors are taken into account, therefore making the Video Assistant Referee (VAR) system ineffective	Using data from FIFA and IFAB regarding laws and regulations for this technology	Understand if this is actually making a different in how this technology is being used
Slow motion replays for reviewing incidents	Mather and Breivik (2020)	1. this process is that when looking at actions in slow-motion, it can give the viewer (VAR operator) a sense that that player would have had more time to act or avoid the ball from touching their hand	Literature information to be used to understand more details	Actual impact that slow motion replays have on the perceived decisions

Appendix 3- Mandatory inclusion in the ARP proposal

	Quantitative Analysis
What data are you going to collect?	Online Survey Questionnaire using Qualtrics to determine the views of footballing fan's understanding and satisfaction of the VAR technology together with the process in today's world.
From whom/ From were	The sample frame will be a population that have knowledge and interest in Football. Targeted towards local and international footballing supporters club members and participants of football.
How much data	The minimum sample size will be Thirty (30) participants but a positive response of Fifty-Six (56) participants was received in this research report.
Research instrument	Draft survey with the following categories: Demographics, Satisfaction with technology in sport In favor of VAR, Satisfied with VAR, Trust , Accuracy , Effectiveness, Enjoyment, Future of technology in football.
Method of analysis	Descriptive analysis, multivariate analysis, Correlation analysis, Reliability analysis and Regression analysis

Resolution of the problem	Comparing the relationship between each construct and providing an analysis/result and conclusion. Using the results to answer these hypotheses questions posed.
Quality criteria	Ensuring the right participant results are analysed by asking key questions about their footballing experience and knowledge. Targeted footballing communities to gain the most accurate responses.
Ethical consideration	Upfront wavier claiming their confidentiality will remain through the processes of this research. Their data will also be stored in a secure laptop database which is password protected. No personal information regarding name, location, ID numbers will be required during the survey process. All participants were made aware of these security controls put into place for their peace of mind.

Appendix 4- Participant information sheet

I Kashveer Karan, a Master's in Business Administration student at Wits Business School (2501810), hereby conduct a research methodology using a quantitative approach. This methodology will be done in the form of an online survey using the tool Qualtrics to produce the survey questions. The tools to analysis the received data from participants will be SPSS. The participants will be allowed to have an option of "neither agree or disagree" in the survey if they are uncertain or not sure how to answer a particular question. This is to allow for their true understanding and not force them to make a choice or skip a question which would compromise the data and its quality. Their personal information will not be disclosed at any given point and time, this will be an anonymize survey. Data collected will be stored in a secured computer that is password protected at all times. Once the final report has been concluded, this will be made available to all participants to view.