

# Augmented Reality in Sport Marketing: Uses and Directions

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The augmented reality (AR) market is expected to grow to \$60.55 billion by 2023 and there are currently an estimated 4.2 billion AR-capable devices in the hands of consumers. Experts believe that sport is a high-value market for AR as it is uniquely positioned to utilize AR in multiple marketing contexts (Haber, 2019). The COVID-19 pandemic has accelerated the rate at which sport organizations are utilizing AR as they attempt to reach fans and consumers that are limited or restricted from attending events in person. This article introduces augmented reality to sport managers and practitioners and defines AR, detailing how it can be used by citing examples of how it has been used in sport marketing to this point. Specifically, the paper discusses the three most common classifications of AR for marketing and their role in sport: advertising/promotion, product management, and customer service. The types of AR delivery systems (e.g., head-mounted display [HMD], projector-based, smartphone, broadcast AR) are also discussed to clarify that AR is a grouping of technologies and not just one hardware platform. Sport and non-sport examples of AR implementations of the different classifications and delivery systems are provided in this text. Three recommendations are provided for AR development and implementation, namely that sport AR activations should be a complement to the sport product, focus on visual appeal, and strive for immersion. These recommendations are grounded in academic research and intended to assist practitioners planning to implement AR as part of their marketing strategy.

Keywords: augmented reality, sport marketing, innovation, technology

## Introduction

Augmented reality (AR) is a technology that is experiencing a precipitous growth in efficacy and implementation. The market for AR hardware and software is expected to grow to \$60.55 billion by 2023 (Markets and Markets, 2018). Further, some of the biggest names in technology development and industry have made substantial investments into the development of AR technology including Apple, Microsoft, Facebook, Google, Amazon, and Disney (Bradshaw, 2017). This

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interest in AR has also found its way into the realm of sport. Most notably, AR activations and strategies have recently been implemented by the PGA, MLB, NFL, NASCAR, NBA, and Nike among others (Neil, 2018). The COVID-19 pandemic has further enhanced the importance of sport entities employing AR for sport engagement. Mark Miller, the CEO of Ticket Socket, emphasized the importance of immersive technologies during COVID-19, saying that AR is one of the “technologies that have to be invested in and expanded by [teams] because they’ve got to fill the void for [lost attendance]” (Young & Graham, 2020, para. 22). Due to the increasing use by sport entities, it is important to attempt to better understand AR’s current and future impact on sport. With that in mind, the purpose of this paper is threefold: to introduce augmented reality to sport management researchers and practitioners, to explain the most prevalent classifications, types, and uses of AR in sport marketing, and to provide some suggestions for future directions in sport marketing research and implementation.

## What Is AR?

AR is a technology that visually blends the physical and the digital. Specifically, AR overlays computer-generated graphics on the real-world environment (Berryman, 2012). AR is a technology that is often grouped with virtual reality (VR) and mixed reality in a category of technologies known as immersive technologies. While often compared to each other, AR and VR are quite different. In short, VR takes the user and places them into an entirely digitally created virtual environment while AR takes digitally created content and places it into the real-world environment. When it comes to sport, both AR and VR have the potential to make a substantial impact (Rogers, 2019). However, at the 2017 MIT Sloan Analytics Conference, multiple sports executives indicated their belief that AR is a more effective tool for sport marketing than VR (Moore, 2017). In fact, Melissa Brenner, the NBA’s senior vice president of digital media, was described as being “decidedly cooler on virtual reality” than AR (Moore, 2017, para. 1).

## Classifications of AR Uses in Marketing

Javornik (2014) identified three classifications for the most common uses of AR in marketing: advertising/promotion, product management, and customer service. Javornik noted that most marketing uses of AR fall into these three categories. Further, most of the research conducted into the use of AR in marketing has also focused on activations and technologies that fit into those classifications. These classifications and their definitions are listed in Table 1. To be clear, due to the dynamic nature of AR, some AR activations perform various functions and could fit into multiple classifications.

**Table 1. Classifications of Augmented Reality Uses in Marketing (Javornik, 2014)**

<b>Marketing Functions</b>	<b>Definition</b>
Advertising/Promotion	Promotion/advertising through augmented content, gamification, and 4D projections
Product Management	Personalized augmentation and simulation (virtual try-on); interactive stores, augmented content
Customer Service	Technical assistance through AR applications

Using Javornik's AR in marketing classifications as a guide, the following sections will identify, organize, and detail how AR is currently being used in the sport industry. The uses of AR listed in the following sections are by no means exhaustive or representative of everything taking place within AR in sport. Further, the technology and the way the industry implements it is evolving at a rapid pace; therefore, the examples and suggestions put forth should be considered a snapshot in time, as best practice and AR use is likely to progress swiftly in this emerging sector.

## **AR for Sport Advertising/Promotion**

Advertising and promotions are easily the most utilized types of AR activations for marketers across all industries (Javornik, 2014). The same is true for the sport industry. This form of AR is meant to bring attention to a product or organization through the use of a novel technology such as AR.

The College Football Playoff (CFP) and Nike teamed up in 2020 to create an AR scavenger hunt through the official CFP app. The AR activation was created by SIDEARM Sports and challenged fans to find four murals located throughout the national championship host city of New Orleans. When these murals were scanned with the official app or Snapchat, they came to life with virtual hype videos for the team represented on the mural. After finding and interacting with the AR for all four murals, fans unlocked the opportunity to buy 1 of 100 limited edition exclusive team-branded Nike Air Force 1 shoes (College Football Playoff, 2020). This use of AR for sport promotion and advertising is a great example of how AR can provide exclusive content and even provide opportunities for e-commerce interactions. It also serves to illustrate how the technology can be used to activate an event host city by directing users to explore specific points of interest throughout the host city.

The Washington Capitals partnered with a Baltimore-based tech company known as Balti Virtual to produce AR experiences. Together they released an AR activation for a cereal called Ovi O's. Ovi O's was named after Capitals star player Alex Ovechkin. Giant Food, the Capitals, and Ovechkin teamed up with Balti Virtual to make a limited edition cereal box with an integrated AR game (Santana, 2019). When users scanned the box using Snapchat, a lens allowed the user to play as Ovechkin and shoot puck-shaped cereal at moving targets (Hansen, 2019). The AR game was specifically added to the cereal box to advertise and promote the product in an effort to drive more purchases and “extend the shelf life of Ovi O's with future launches” (Santana, 2019, para. 14). The launch of the cereal was a success thanks in part to the AR activation. The Capitals found that 20% of consumers that purchased the cereal interacted with the AR game (Santana, 2019).



Figure 1. “Ovi O's Slapshot” AR game (Cohen, 2019).

Clearly, opportunities exist for sport properties and partners to advertise and promote their product through AR. The array of activations cannot clearly be conveyed in this format, but the opportunities are wide-ranging and ever-increasing.

## AR for Sport Product Management

The use of AR for product management generally entails AR being used for commerce to enhance a retail location or a product that is for sale to the consumer. This use of AR has been realized through the virtual “try on” of products that are for sale and the augmentation of items or store locations (Javornik, 2014) including the ability to virtually try on makeup, sunglasses, watches, and jewelry

prior to purchase with links to purchase the product after the interaction (Yim, Chu, & Sauer, 2017).

Sport broadcasts are a product that has a great deal of potential to be enhanced by AR and second screen viewing. Fans at the 2018 MLB All-Star Game in Cleveland were able to try on jerseys and up to 45 other MLB-branded products via virtual dressing room kiosks prior to making a purchasing decision. Participants were able to visit the “Virtual Fitting Room” created by Zuagara and official MLB apparel retailer Fanatics and try on multiple items in a matter of seconds. The interaction was utilized via a “magic mirror” screen that tracked the body positioning and size of the user to overlay virtual apparel on the user in a realistic looking virtual display. Participants could then have pictures of their interaction emailed to them and proceed to the attached retail location to purchase the exact items that they had just virtually tried on (Szymczyk, 2018).



**Figure 2.** Fanatics “Virtual Fitting Room” (Szymczyk, 2018).

The product being managed in the product management classification can even be the team or athletes themselves. The Dallas Cowboys have integrated AR installations and interactions to enhance the fan experience in their state-of-the-art stadium. Perhaps the most “viral” of those AR experiences was the AR fan selfie activation that they called “Pose with the Pros” (Draper, 2019). The activation allowed fans in AT&T Stadium to stand in front of one of the interactive columns found throughout the stadium and choose players with which to virtually take a picture. After the fan chose the players that they wanted in the picture, the players were displayed on the screen with the fan and a picture was taken that could be printed off or shared on social media. The Pose with the Pros activation received more than 50 million impressions on social media in its debut weekend alone (Draper, 2019).



**Figure 3. Dallas Cowboys “Pose with the Pros” (Haber, 2019).**

### AR for Sport Customer Service

Javornik (2014) found that in marketing, customer service was the least utilized of the three classifications of AR and it seems as though that finding rings true for sport marketing uses of AR as well. Customer service uses of AR provide the user with some sort of technical assistance through the interaction with the AR activation. While few in number, AR interactions for customer service can be very impactful.

StubHub, the largest ticket marketplace in the world, decided to develop AR technology to help Super Bowl ticket holders find their way in and around U.S. Bank Stadium in Minneapolis for Super Bowl LII (Bell, 2018). Prior to the game fans could open the StubHub app and view a 3D model of the stadium and important areas around the stadium. This type of AR interaction is commonly known as a wayfinding interaction. This 3D view of the stadium allowed users to see where their seats were in relation to other sections, entrances and exits, fan interaction areas, and also see parking areas around the stadium itself (Bell, 2018). After the addition of the AR technology, StubHub found that engagement within its app doubled (Bell, 2018).

One of the most impactful aspects of AR for customer service is that it is targeted at addressing a specific issue. Matt Swann, the chief technical officer at StubHub during that time, spoke to the targeted nature of AR for customer service, saying, “We’re solving for real pain points, not just tech for the sake of tech” (Bell, 2018, para. 5).

The Cleveland Cavaliers utilized the Microsoft HoloLens for a novel use of AR for customer service. In 2017, the Cavaliers undertook a \$140 million renovation on Quicken Loans Arena (Booton, 2017). To keep key ticket holders, board members, and community leaders aware of the progress of the renovation, the Cavaliers gave them a tour in AR. When wearing the HoloLens, participants could see the renovated arena and its updates displayed virtually on a table





**Figure 4. StubHub Super Bowl AR (Bell, 2018).**

in front of them (Booton, 2017). The AR product called a holomap allowed participants to see 360-degree visualizations of key sections of the arena. The Cavaliers' chief information officer, Michael Conley, summed up the key role AR played in helping the team unveil the new arena renovations, saying, "It set the foundation for us going into a transformation project that puts technology at its core" (Booton, 2017, para. 4).

There is a great opportunity for organizations to create AR interactions that serve customer service purposes. It has been proven time and again that an integral part of the sport consumer experience is customer service quality (Howat, Absher, Crilley, & Milne, 1996; Ko & Pastore, 2004; Theodorakis, Kambitsis, Laios, & Koustelios, 2001) and AR, when created well, can help to enhance customer service quality (Javornik, 2014).

## Types of AR

The journey to understanding how to best utilize AR requires a basic knowledge of its various forms and delivery methods. The most widely used mode of delivery for AR and the primary focus of this paper is visual AR. Visual AR can be delivered through multiple channels that include head-mounted display (HMD) AR, projector-based AR, broadcast AR, and smartphone-based AR (Schmalstieg & Hollerer, 2016). The types of AR work together with the previously listed classifications of AR to provide more context into how AR is presented and employed. No one type of AR is specifically wedded to any one classification

of AR in marketing. Instead, the types of AR can be manipulated to be used for multiple classifications depending upon the context of the situation.

## Head-Mounted Display AR

There are two types of AR HMDs, those that display 2D information and those that display 3D imagery and information. Devices in the HMD category are regularly being created and going defunct, making HMDs a category of AR that is constantly in flux (Fink, 2017). Some current examples of HMDs in the 2D category include Focals by North, Epson Moverio, and Vuzix Blade. Full 3D HMDs for AR include more powerful systems that feature stronger computing power such as the Microsoft HoloLens, Microsoft HoloLens 2, and Magic Leap. One of the biggest limitations and drawbacks at this time for both 2D and 3D HMDs is that they are expensive (HoloLens 2: \$3,500, Magic Leap: \$2,295, Vuzix Blade: \$1,000), and thus are cost prohibitive for large-scale research, deployment, and use (Diaz, 2019). HoloLens was the type of device utilized by the Cavaliers in their aforementioned customer service deployment of AR.

## Projector-Based AR

Projector-based AR is a form of AR that utilizes a projection system to display the AR graphics on an object or space (Bimber, 2004). Often these projections allow the user to interact with them and see them in three dimensions. Projector-based AR installations have been used for museum displays, medical training, and architectural design manipulations (Haller, Billingham, & Thomas, 2007). In sport, projector-based applications of AR have been used for skill training and skill acquisition. In billiards, a tool called PoolLiveAid has been used for training and entertainment. By detecting the table rails and the location of the balls on the table, the system displays the angles of each possible shot based on where the user is pointing the pool cue (Sousa, Alves, & Rodrigues, 2016).

## Broadcast AR

Sport broadcasts have historically implemented sparse amounts of AR graphics in their productions, such as the first-down line. Recently, AR graphics and interactions have become far more commonplace and sophisticated than previously used AR broadcast graphics. The use of AR in sport broadcasts is an example of using broadcast AR for product management. In 2019, the NHL broadcast its all-star game with AR broadcast technology that tracked the puck and players and overlaid statistical data in real-time (Wyshynski, 2019). The action was tracked by placing sensors in the puck and in the shoulder pads of players. The accuracy of the tracking was made possible by installing 14 antennae in the venue that monitored the system up to 2,000 times per second (Wyshynski, 2019).



The NHL is not alone in its use of next-generation AR graphics for broadcast purposes. The NBA recently partnered with Second Spectrum to track and overlay statistical data and graphics through a program call CourtVision that is powered by artificial intelligence (Bishop & Soper, 2018). This technology has been extensively utilized by the Los Angeles Clippers through their broadcast partnership with Fox Sports and through their Clippers CourtVision app. The technology was also utilized for select NBA games during the 2019 and 2020 seasons as an alternate broadcast option (Ogus, 2019). The NBA has plans to disseminate this technology in a more widespread fashion in national broadcasts in the future (Ogus, 2019).

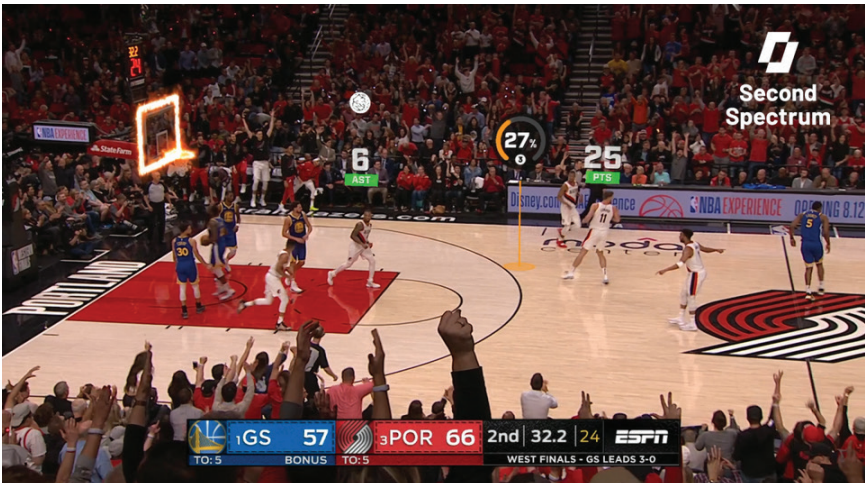


Figure 5. ESPN Second Spectrum AR-enhanced broadcast (Ogus, 2019).

### Smartphone-Based AR

Smartphone-based AR is easily the largest and most utilized platform for accessing AR interactions (Iquii, 2018). In fact, there are estimated to be 4.2 billion AR-compatible smartphones owned by individuals across the globe (Boland, 2017). This is thanks in large part to Apple developing and implementing ARKit in its devices beginning in September of 2017 and Google following suit with ARCore for Android devices in February of 2018 (Blum, 2018). Due to its portability and accessibility, the smartphone clearly seems to be the best delivery system for consumer AR interactions, with Haller et al. (2007) going so far as to call the smartphone “an ideal platform for augmented reality” (p. 91). Due to the ubiquitous nature of the device, the smartphone will continue to be a cornerstone technology for AR interactions in sport and is a strong fit to be used for all three

classifications of AR: customer service, product management, and advertising and promotion. Sacramento Kings' chief technology officer Ryan Montoya confirms the value in utilizing smartphones for AR in sport, saying:

We know our fans walk around with computers in their pockets that they look at 200 times per day. Ultimately whether a fan wants to know how fast players are running down a court or where the nearest restroom is, it makes their world a lot more efficient. (Santana, 2019, para. 25)

## Academic Research and AR in Sport

There has been a great deal of academic research into AR in multiple fields (Cipresso, Chicchi Giglioli, Alcaniz Raya, & Riva, 2018). However, when specifically focusing on sport, the academic research is sparse. The vast majority of AR research into sport is computer systems related and focused on the development and efficacy of systems for tracking players and creating technology to do so (Jang, Ko, Lee, & Kim, 2018; Lee, Ahn, Hwang, & Kim, 2011). While these types of studies are valuable, they only investigate the creation of tracking programs and do not examine consumer interaction with the technology. Consumer acceptance and intentions are critical for academicians and practitioners alike when it comes to understanding the potential impact of AR technology on sport.

Rogers, Strudler, Decker, and Grazulis (2017) utilized self-determination theory to investigate how consumers interact with AR technology while viewing a game. In their study, fans were tasked with searching for statistical information during the course of a game broadcast. The participants were divided into three groups. One of the groups searched for the statistical information via a traditional game program, one used a web search via a smartphone, and one searched for the information through an AR HMD known as Google Glass. The researchers found that participants did not prefer using the AR HMD to seek out information during a sport event broadcast. While this finding is interesting, it is important to note that the AR technology utilized in this study, Google Glass, is a failed product that is no longer a consumer-facing product. The findings of Rogers et al. (2017) coupled with the fact that the technology utilized in their study is no longer a technology that consumers can access underscores the need for further research into this topic. In fact, Rogers et al. (2017) suggested just that, imploring future researchers to not only investigate the multiple uses of AR, but also the multiple types of AR content.

To that end, Goebert and Greenhalgh (2020) investigated consumer perceptions of three different AR-enhanced smartphone application prototypes utilizing the technology readiness and acceptance model (TRAM). The TRAM combines

the technology readiness index (TRI) and the technology acceptance model (TAM) to better understand the acceptance and utilization behavior of consumers in regard to emerging technology (Lin, Shih, & Sher, 2007). Their prototypes were representative of the three classifications Javornik (2014) identified for AR use in marketing functions: advertising/promotion, product management, and customer service. Goebert and Greenhalgh (2020) found that while AR can elicit positive consumer perceptions and intentions, AR is likely most powerfully used as a complementary technology and should not be expected to take the place of the core sport product.

There are a number of theoretical frameworks that could be utilized to investigate AR in sport. Researchers could follow the lead of AR marketing studies from Haugstvedt and Krogstie (2012), Rese, Schreiber, and Baier (2014), Spreer and Kallweit (2014), and Huang and Liao (2015) to help guide and adapt future AR adoption and acceptance research into sport. Outside of acceptance research, AR marketing studies could also lead the way for sport researchers that want to conduct theory-based research into media characteristics (Javornik, 2016), interactive advertising (Beck & Crie, 2018), brand attitude (Rauschnabel et al., 2019), experiential value (Dacko, 2017), and consumer-brand relationships (van Esch et al., 2019).

AR can be expressed through the manipulation of an array of the senses and experienced through a variety of mediums including haptic, audio, olfactory, and visual (Schmalstieg & Hollerer, 2016). Future researchers would be wise to investigate how these other sensory forms of AR are used in sport, particularly auditory AR as it can be utilized to simulate realistic auditory surroundings of sport events and venues.

Future studies should focus on the different types of AR: smartphone, projector-based, broadcast AR, and HMD AR. It is quite likely, due to the differences in the delivery systems of the AR, that each type would impact a consumer's perceptions, attitudes, and outcomes of the interaction differently. Each of these delivery methods should be studied and compared with each other to attempt to establish the best utilization of each type of AR delivery system based on the specific sport context. The call to better understand how to utilize AR in sport marketing is underscored by ESPN president James Pitaro, who, when discussing AR, says, "We want to be very careful in this space in that we don't want to address one problem and create another. We don't have enough data yet" (Sharma, 2019, para. 13).

## Recommendations for Sport Marketers

Although more research is necessary, practitioners can draw guidance on the implementation of AR in sport marketing contexts from the existing literature. In

fact, AR has been shown by the academic literature to be beneficial in marketing products and brands (Rauschnabel, Felix, & Hinsch, 2019). To make the consumption of the literature and its findings more digestible, what follows are three research-based recommendations sport marketers should contemplate prior to and during the development of AR interactions. These are not the only factors that marketers will need to consider; however, they provide a solid research-based foundation from which to begin developing an activation.

First, visual appeal is one of, if not the most important aspect of an AR interaction. In marketing circles, visual appeal has long been known to be an important part of an effective marketing strategy. Oh, Fiore, and Jeoung (2007), in their study on marketing and the experience economy, found that visual appeal accounted for the largest portion of the variance in overall consumer satisfaction and called the focus on visual appeal a key factor in future marketing strategies. Liu, Xiao, Lim, and Tan (2017) found that visual appeal was an important factor in website design and e-commerce. Further, they found that well-designed visual elements of a website had a direct impact on consumer online purchases. Chung, Han, and Joun (2015) considered the importance of visual appeal in a study conducted to understand how an AR tourism activation impacted a tourist's intention to visit a site. The authors found that visual appeal was quite important in AR, as it had a significant impact on a user's perceptions of both ease of use and the usefulness of the AR interaction. In a study specifically focused on the use of AR in sport marketing, Goebert and Greenhalgh (2020) found that visual appeal influenced not only a consumer's intention to use the technology but also the consumer's intention to talk about it positively via word of mouth. Clearly, the visual appeal of an AR interaction should be at the forefront of any plans to utilize the technology for sport marketing.

Second, AR is a complementary technology and at this time should be utilized as such (Billinghurst, Clark, & Lee, 2015). Whereas VR is a standalone technology that creates an entire virtual setting that a user enters into, AR instead is dependent upon the object or location it is augmenting and enhances the physical setting in which it is utilized. This is an important concept to understand when considering the development of an AR interaction. Yaoyuneyong, Foster, Johnson, and Johnson (2016) investigated consumer preferences and attitudes toward static 2D advertisements, print advertisements enhanced with AR elements, and AR-only advertisements. The authors found that AR was better received in combination with the print ad as an enhancement. The authors' recommendation from their findings was not to replace the traditional ad with AR, but instead have AR "serve as an extra feature, letting consumers gain access to added content" (Yaoyuneyong et al., 2016, p. 27). Goebert and Greenhalgh (2020) found that this concept holds true for sport as well. In their study, the authors found

that the activation they utilized that enhanced an actual athletic competition with AR graphics was not as well received as their other activations that did not impact actual gameplay. From that finding, the authors suggested that sport uses of AR should be complementary and not interfere with the core sport product. The complementary nature of AR positions it to not only be a complement to advertisements and events but also the host cities of those events. Similar to what Nike and the College Football Playoff app did in New Orleans, by partnering with stakeholders in event cities, AR interactions can be utilized to steer users to local points of interests that benefit the partners within that host city.



**Figure 6.** AR-enabled mural in CFP host city New Orleans (College Football Playoff, 2020).

Finally, immersion should be considered a goal of any AR activation but especially those intended to be utilized for marketing purposes. Immersion takes place when the quality of an AR application is high and a user becomes fully involved in the interaction (Rauschnabel et al., 2019). High-quality AR interactions require an authentic experience created through a well-thought-out premise and strong execution of the AR both intellectually and visually (Hilken, de Ruyter, Chylinski, Mahr, & Keeling, 2017). One important aspect of immersion is that it allows the consumer to see an AR interaction as an authentic experience with a product or location (Lee, 2004). To properly experience immersion with an AR interaction, consumers must be able to freely interact with that experience, and



experience the interaction with visual realism (Faust et al., 2012). The need for visual realism to experience immersion further underscores the first recommendation of this paper to focus on visual appeal. Scholz and Smith (2016) found that AR can be used to create immersive marketing experiences that allow consumers to “experience products and spaces in novel ways” (p. 150). The Sacramento Kings found that focusing on immersion in their AR activations allowed their consumers to move from being passive spectators to active participants in the game presentation experience (Montoya, 2018).

## Conclusion

AR in its various forms and classifications is a powerful tool that can continue to make a substantial impact on sport and sport marketing. The potential uses for AR in sport present myriad opportunities for both practitioners and researchers. The purpose of this paper was to introduce augmented reality to sport management researchers and practitioners, to explain the most common classifications and uses of AR in sport marketing, and to provide some suggestions for future directions in sport marketing. This paper expressly concentrates on the use of AR in a sport marketing context. There are many other uses for AR in sport including but not limited to sport training, sport science, and athlete tracking that should also be considered for future study and implementation. The uses of AR in sport will no doubt continue to grow and evolve as in many ways this is still a nascent technology. Practitioners and researchers alike need to be agile and prepared to pivot as the technology continues to develop. By being aware of the classifications, uses, and types of AR put forth in this paper, researchers and practitioners can gain a better understanding of how to study and implement AR technology in the future.

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