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Digitizing Sports Arenas: New Trends and Technologies

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ABSTRACT

The digital revolution has transformed the world we live in, including the professional realm, which has harnessed its advantages. Digital technologies are widespread in the sports world, used daily in all its facets: strategically employed by brands, leveraged by coaches and athletes to optimize performance. It's worth noting that the sports spectacle accompanies and even inspires technical innovations (Wille, 2015)¹, and the adoption of these tools provides a decisive "competitive advantage," both in sports and commercially (Giblin et al., 2016)². For the field of sports marketing, the rise of digital offers fervent and loyal supporters, the famous fans, a new way to experience current sports events and immerse themselves in them (Bailey, 2017)³. Today, we talk about a "connected match," a "smart stadium," and "digital sports." It is essential to understand how the introduction of technological tools within sports facilities, especially in the behavior of fans, positively or negatively changes the landscape. A literature review outlines the technological tools introduced in sports venues, the role of social media as a new communication channel, and the digital's position in the sports entertainment industry. A qualitative study then confronts the views of sports managers with those of fans regarding the role of various technological tools within sports facilities.

Key words: Sports Venue, Sports Industry, Technologies, Digital

1. INTRODUCTION

In the world of sports, the number of events has continued to grow over the past decade. To such an extent that some sports have lost clarity, no longer knowing which events were the most important in the discipline: tournaments, championships, cups, circuits, etc., at the national and international levels, involving teams, clubs, regions, and countries. We have also witnessed a significant professionalization in the organization and marketing development of these events, leading to the proliferation of higher education programs in sports marketing and the creation of many "new" professions and specializations, such as Growth Hacker, Data Analyst, or Digital Strategist, to name just a few. The digitization of sports venues offers new opportunities to enhance the spectator experience. Mobile applications, augmented reality, improved connectivity, and dynamic displays are transforming how fans interact with sporting events. These advancements pave the way for a more immersive and personalized experience, thereby increasing fan engagement and offering new revenue opportunities for sports venues.

The aim of this study is to understand how spectators and professionals in the sports sector (sports venue managers, sports marketing specialists) perceive the introduction of digital technology into sports facilities. These two perspectives aim to comprehend the impact of connectivity within venues on the spectator experience and to provide venue managers with a better understanding of how sports events can be consumed today. This will enable them to adapt their offerings, satisfy diverse audiences, and foster loyalty,

especially as stadium attendance is declining (Bal and Badier, 2015). To gain a nuanced understanding of the perceptions of both spectators and sports industry professionals, semi-structured interviews were conducted with venue managers and sports marketing professionals, as well as with sports event consumers. This study reveals convergent yet contrasting results, confirming that the technological environment can enhance the experience for some spectators but may also disrupt the experience for others. Initially, a literature review provides an overview of the technological tools introduced in sports facilities and the new interactions related to social media. The qualitative study is then presented, the results are discussed, along with the limitations and avenues for future research in this work.

2. Literature review

a. Digitalization

Digital technologies are thus changing the game, radically revolutionizing human activity and evoking both fears and hopes (Ostrom et al., 2015)⁶. In dictionaries, technology (etymologically the study of techniques, ways of doing things) is defined as a set of technical characteristics reserved for experts, requiring training. The digitization of sporting events is an ever-evolving field characterized by the use of digital technologies to enhance the overall sports experience, whether for spectators present at the venue or those following the event remotely. It can generate positive feelings of control, freedom, novelty, competence, efficiency, satisfaction, association, and engagement. However, at the same time, it can also lead to chaos, enslavement, dissatisfaction, and isolation. These negative emotions can result in customer dissatisfaction (Liu, 2012; Lee & Baker, 2017). To ensure that digitalization leads to more positive and virtuous behavioral outcomes, an ethical perspective seems necessary (Morosan & DeFranco, 2016). Therefore, it appears essential to consider the interplay between the spectator experience and new technologies in all its complexity, with measurement and adaptation that enable reasoned and satisfying use for the consumer.

b. Customer and Spectator Sports Experience:

The customer experience can be defined as the sum of interactions between a customer and a product, service, company, or part of that company, which elicits a personal and engaging response on various levels, including rational, emotional, sensory, physical, and spiritual (Gentile et al., 2007). It involves the coordination of numerous mechanical and human elements in a specific consumption context. These elements encompass all aspects of the experience, whether it's the product, service, moment, location, individuals involved, etc., and can be associated with functional, emotional, or sensory aspects.

Currently, the customer experience is undergoing major changes that influence consumer behaviors and the value they seek (Pine and Gilmore, 2002). More specifically, this evolution goes beyond mere utility or symbolism and now

revolves around the creation of memorable moments. In other words, the customer experience represents a holistic entity that extends beyond utilitarian or symbolic aspects.

A spectator at a sporting event can be considered a customer, and the sports spectacle itself must be designed to provide an experience that meets their expectations to encourage their participation. This is why the concept of the customer experience implicitly encompasses the idea of the spectator experience. In this study, both terms are used interchangeably. Additionally, Biscaia and colleagues (2018) delve into the concept of fan identity, representing supporters' sense of belonging, which is considered a multidimensional construct. They identify psychometric properties such as "internal legitimacy," which shows a significant correlation with fans' intentions to attend more matches and purchase branded products. Therefore, it is essential for a sports club to work on creating a sense of legitimacy among fans, considering them as active members of an entity. Furthermore, Theodorakis' study (2014) underscores the importance of co-constructing the experience with fans, emphasizing that fans should play a central role in creating atmospheres and experiences within sports venues.

c. Crowd management and operational efficiency

Some stadiums have embraced customer-facing technology, while others have focused on backend improvements to streamline operations or utilize analytics to reduce costs. For example, Croke Park in Dublin, Ireland, leverages Microsoft's Azure IoT suite to gather data for machine learning analysis. This enables the prediction of optimal times and locations to illuminate the pitch with heat lamps for optimal growth, resulting in tangible savings for the stadium owners (SmartDublin, Citation2016).

Wakefield et al. (Citation1996) suggest that the physical environment of a stadium significantly influences spectators' desire to return, but they overlook the role of technology, which now plays a substantial part in the stadium experience. Today, technology is pervasive in the stadium environment, whether through consumer tools like stadium apps, fan engagement initiatives, and social media integration, or through operational enhancements aimed at reducing congestion and preemptively addressing inventory issues.

3. Material and methods

After completing the literature review, it is crucial to gather the perspectives of key actors in the interface between spectators and technology within the stadium. To this end, semi-structured interviews were conducted with ten international experts in management and marketing. The primary objective of these interviews was to facilitate exchanges between these stakeholders regarding their use of technological tools and the underlying motivations for their use. Topics covered during these interviews included current technological trends in the sports industry, the impact of technology on the spectator experience, and strategies aimed at enhancing and optimizing this experience through the

implementation of innovations that take into account its complexity and multidimensionality.

4. Results

Most of the consulted experts and consumers agree that connectivity can enhance the overall experience. In this context, the goal is to improve the speed of stadium access, ease of exit, consumption, and security so that fans can quickly obtain information about the availability of food at specific locations and minimize their waiting time. Mobile applications play a key role in this enhancement of the experience, particularly by facilitating transactions. Ultimately, the experience of a sporting event should match the connected experiences people have in their daily lives, such as contactless or smartphone payments, as well as ticket management through mobile apps. Cashless cards also simplify transactions, whether it's for stadium access, purchases at the club's store, or refreshments at the concession stand. Solutions like Digifood4 even offer the possibility of having what you ordered in the stands delivered to you, which avoids waiting at the concession stand and the risk of missing important moments of the game. This also contributes to enhancing the spectator's experience by providing a smoother and more efficient service.

Immersive technologies, such as augmented reality, are also being implemented to enable fans to access additional information, such as exclusive sequences and survey statistics, as well as analyses. These tools are exceptionally complex, being interconnected, evolutionary, and multidimensional. They are an integral part of a system that can only be fully understood by adopting a holistic perspective. Innovations often develop within a framework of cooperation between various techniques, which facilitates their development and dissemination (Caron, 198728). However, the creation of a digital device requires consideration of various temporal and situational factors:

- Easy and unlimited accessibility over time, as well as the ability to enhance and share the experience through mobile applications.
- Implementation of artificial intelligence algorithms to define content suitable for a specific event.
- Advancements in immersive technologies (XR).
- Progress in connected devices.
- Introduction of 5G technology.
- Integration of artificial intelligence and service automation.

The quest for a more flexible spectator experience relies on the constant improvement of Internet connectivity systems. As a result, sports enthusiasts can enjoy a moment that aligns with their personal interests without any time or location constraints. From their homes, in front of their screens, the world of sports opens up to them, or at least that's how they perceive it.

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