

## How the sports and entertainment industry is reinventing the fan experience and enhancing revenues with computer vision

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*Smart stadiums are revolutionizing the fan experience. Think in terms of real-time updates regarding parking, concession and restroom lines, in-seat accommodations, live stats regarding your favorite team and athletes delivered to your phone as you watch the game. The possibilities for engaging attendees, increasing revenues and improving sustainability using real-time situational awareness and insights through computer vision are nearly limitless. Data-driven venues from sporting events and concerts to other live events are helping to bolster the entertainment industry while simultaneously helping to ensure a safer environment for all.*

There's nothing quite like the thrill of the game or the concert atmosphere. Today, people tend to value experiences more than physical possessions, generating billions of dollars annually to the "experience economy." Venues and stadiums are fed by a multitude of companies that make up the sales and supply chains in support of you having a great time, at least for a few hours.

However, the sports and entertainment industry, like many others, experienced a huge loss of revenue over the last few years. Even before the pandemic, the industry has been working to improve ratings and attract more fans, so the recent losses were even more detrimental to the industry's financial outlook.

Computer vision is helping to turn the industry around by using technology that appeals to fans and builds enhanced operational processes, leading to higher revenues and improved safety and security. It all boils down to using data efficiently. By capturing visual and sensor data, combining it with other data points and analyzing it all for insights and trends— at the edge rather than the data center—more informed decisions can be made at the spur of the moment. This **federated approach** to data analysis happens in near real time. No instant replay is necessary.

## **Safety and security provide the foundation**

While people go to sports and entertainment venues to have fun, they also expect a safe and secure environment, but the nature of crowds can create unsafe situations. Every facility has a safety and security infrastructure already capturing thousands of video streams. Additional insights can be gained by implementing computer vision from these streams.

Safety often requires quick decisions and real-time situational awareness. Predictive occupancy, where people flow is anticipated before a bottleneck occurs, is extremely valuable to operations, vendors and a positive visitor experience, but it's often difficult to do well due to the number of variables involved.

The data gathered from cameras and sensors as part of a computer vision system, along with machine learning, make it easier to find missing persons and to identify people who are not allowed to be in a venue. Computer vision systems can also determine how many people are in a location, which is valuable to ensure that crowds are kept under capacity limits or if an evacuation is necessary.

## **When fickle fans demand more, computer vision delivers**

Fan retention is a major topic today. Where there are less committed fans, there will be fewer attendees and potentially lower revenues for organizations. Plus, there has been a significant change in the fan base mix and expectations of the fan base. Many fans are used to more information at their fingertips and want a more seamless experience without many hurdles.

Computer vision is literally a game-changer. It creates a connection for fans by providing instant information on player performance (spectator turned analyst), guiding them to short concession lines and building a sense of community and excitement via fan engagement walls.

Player performance information also improves the quality of coaching and reduces decision-making time, making for a higher quality game and broadcast. And that makes fans much more likely to come back.

## **Greater operational efficiencies through real-time actionable intelligence**

Data is key to improving operational efficiencies. Augmented-reality–based wayfinding in venues lets customers find attractions, concessions, their seats or even friends more easily.

Queue management also benefits from computer vision, where potential queue or wait times at concession stands are alleviated through fan notifications and dynamic staffing. Informing spectators of current conditions and suggesting best times for various actions can vastly improve their experience.

Computer vision insights are used to predict the most and least busy times by combining visual data with gate ticket data to understand current crowd counts and predict crowd flows (the **Indianapolis Motor Speedway** used this technology for the Indy 500). Such information can be critical in making operational decisions related to and allowing for more effective allocation and adjustment of scarce resources. For example, concession stand and retail merchandise shop owners can use occupancy conditions to make more effective decisions on deploying their staff and optimizing inventory, especially for items with a limited shelf life.

Computer vision systems can also collect data on parking availability or allow for enhanced quality of access for certain categories of fans through enhanced recognition capabilities.

## How computer vision contributes to sustainability efforts

Think of each venue as its own ecosystem, with people, goods, commercial entities, and vehicles bustling about. The venue delivers water, energy, heating and cooling as needed to provide a comfortable and safe experience. Smart building controls with computer vision can make these environments more sustainable while helping to reduce energy usage and costs.

Any efficiencies to reduce unnecessary movement of vehicles or to conserve energy and resources such as electricity and water can lead to a more sustainable environment. Computer vision can enable more targeted parking by providing real-time and predicted parking availability information. It can help determine the number of people waiting to be shuttled from parking lots to the main venue and make more efficient decisions as to when shuttles should move. Autonomous driving vehicles are making inroads in this area. Designed to operate at peak efficiency by regulating speed and acceleration, stadiums will soon be able to efficiently move people in autonomous shuttles to and from parking areas with no driver involved.

## Taking a look at the bottom line

A few things are critical for revenue generation – enabling and increasing visitors to the venues and making it easy for them to spend their money. Engaging them in a personalized way also delivers a great overall experience that makes them want to come back and get others to do so as well.

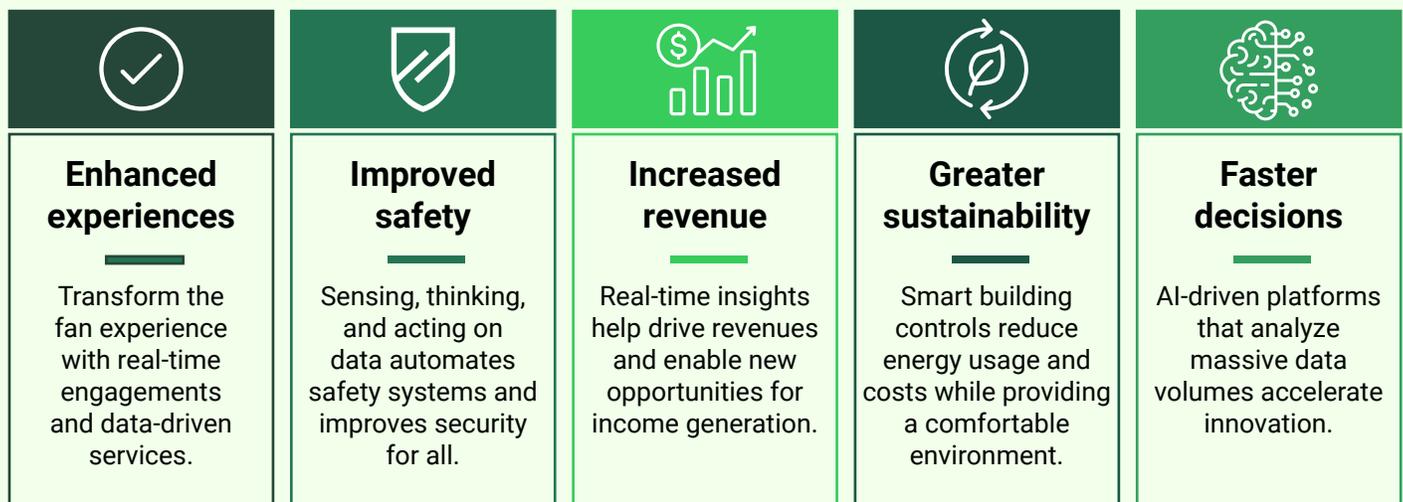
Customers spend money in the venue upfront for tickets, then at the concession stand, on memorabilia and probably for parking. Broadcasters and advertisers are willing to pay more if they can get eyeballs on their names and logos. Vendors will pay more for a spot that draws more visitors. The thread here is computer vision makes all of it easier to accomplish.

Revenue-generating opportunities are also expanding outside of the venues. Ultra-reality viewing is recreating the experience by transmitting real-time, immersive video to fans in remote locations, creating an additional revenue stream tied to the same event.

## Will the ripple effects of computer vision lead to winning outcomes for the entertainment industry?

The impact of being able to gather data at the edge and analyze it at the right speed and velocity to make time-critical determinations on one aspect of the sports and entertainment industry serves as a catalyst for change or growth in others. Different data points, like audio and video data combined with gate ticket and visitor data, are ingested once and analyzed for multiple uses, producing insights that can be used to positively impact safety, the customer experience, operational efficiencies, sustainability and revenue generation (Figure 1). More specifically, enhanced operations result in a safer, more efficient, better-quality event, which results in greater fan participation and more revenue across the supply chain.

**Figure 1.** Benefits of real-time situational awareness and insights for the entertainment industry



This ripple effect coupled with the rapid acceleration of digital transformation is teeing us up for an exciting next inning. Computer vision can and will do substantially more for the entertainment industry, so keep watching.

Read these sports and entertainment case studies:

- Revolutionizing the fan experience of the Tour de France. [Read the case study.](#)
- Miami Dolphins: Increased engagement, stadium security for the ultimate game-day experience. [Read the press release.](#)
- Creating a Digital-First Motorsports Experience by Shaping the Future of Fan Engagement at the Indianapolis Motor Speedway. [Read the case study.](#)

### **Learn more about how computer vision is positively impacting other industries:**

- The Future Is Computer Vision – Real-Time Situational Awareness, Better Quality and Faster Insights. [Read the article.](#)
- Computer Vision Is Transforming the Transportation Industry, Making It Safer, More Efficient and Improving the Bottom Line. [Read the article.](#)
- How Computer Vision is revolutionizing the Manufacturing Supply Chain. [Read the article.](#)
- How the retail industry can improve the customer experience, increase safety and maximize margins through computer vision and AI. [Read the article.](#)
- Computer vision is becoming an accelerator for education. [Read the article.](#)

The Innovation Institute for Fan Experience hosted an international conference, “Innovative Changes Driving the Fan Experience in the Sports & Entertainment Industry”, May 24-26, 2022, at Caesars Palace, Las Vegas. The focus of the conference was to explore ways to create conditions for success to help sports and entertainment organizations complete their mission, achieve their objectives, and build resilience.

For more information: [fancentric.iifx.org](https://fancentric.iifx.org)

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