STADIUM
TECH REPORT

STADIUMS EMBRACE SELF-SERVE BEVERAGE TECH

SUPER BOWL RESETS WIRELESS DATA USE RECORDS

STR MARKET REPORT:
VENUES, FANS EMBRACE CHECKOUT-FREE CONCESSION STORES

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TECH REPORT

Welcome to the first issue of our TENTH year of STADIUM TECH REPORTS, the Spring 2023 issue!

These long-form reports are designed to give stadium and large public venue owners and operators, and digital sports business executives a way to dig deep into the topic of stadium technology, via exclusive research and profiles of successful stadium technology deployments, as well as news and analysis of topics important to this growing market.

Our stories for this issue include an in-depth profile of the new "drink machine" concession stands which provide self-service beverage options for stadium concessions; a recap of the record-setting wireless statistics for Super Bowl LVII; and our inaugural STR Market Report, this one on checkout-free technology.

We'd like to take a quick moment to thank our sponsors, which for this issue include Verizon, MatSing, Mobilitie, JMA, Boingo, CommScope, American Tower and AmpThink. Their generous sponsorship makes it possible for us to offer this content free of charge to our readers.

We'd also like to welcome members of the The Association of Luxury Suite Directors (ALSD) and the International Association of Venue Managers (IAVM), who now have access to Stadium Tech Report content. We'd also like to welcome readers from the Inside Towers community, who may have found their way here via our ongoing partnership with the excellent publication Inside Towers.

As always, we are here to hear what you have to say: Send me an email to kaps@stadiumtechreport.com and let us know what you think of our STADIUM TECH REPORT series.

Paul Kapustka, Founder & Editor
Stadium Tech Report

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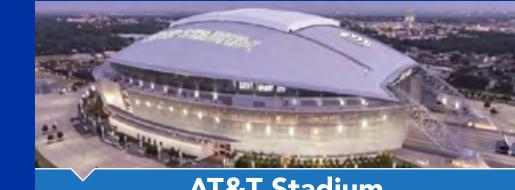
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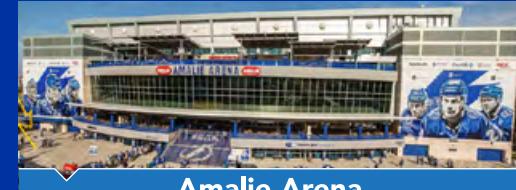
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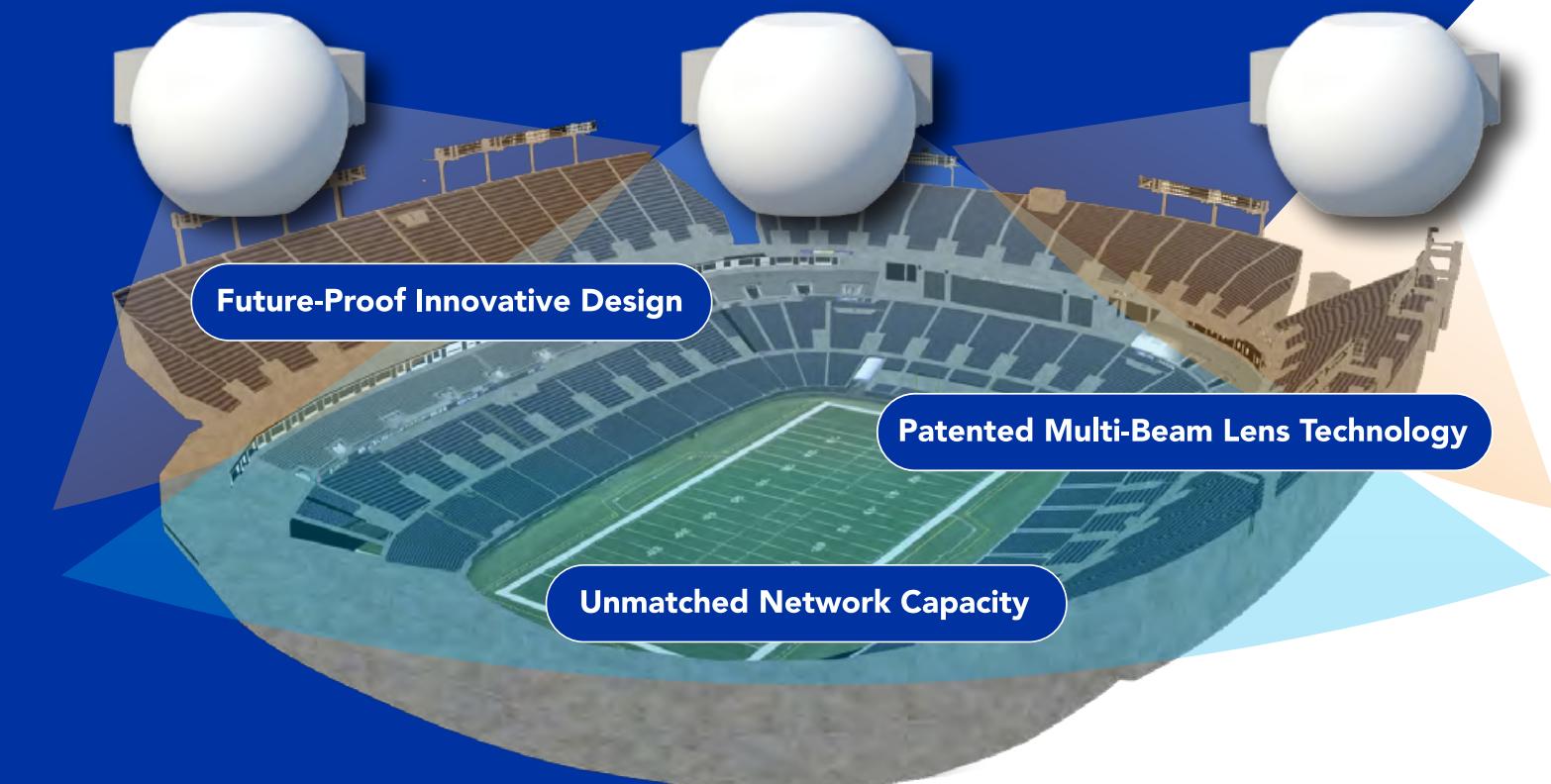
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Paul Kapustka

LOOKING BACK AT 10 YEARS OF COVERING STADIUM TECHNOLOGY

We've come a long way, haven't we, from leaky coax to MatSing Lens antennas?

As we start the 10th year of our quarterly Stadium Tech Report publications, permit me if you will a short look back to see where it all started and where we are now.

The good news is, after a decade of writing about as many stadium technology deployments as possible, I don't have to answer the question anymore about "why do you need Wi-Fi in a stadium?" By now, all those people who asked that in the past have been to an event, taken a selfie or a video, and shared it with someone not there.

So now they get it.

And while we still love a good Wi-Fi deployment story here at Stadium Tech Report we've expanded our early repertoire with a question I hope we get to keep asking: What's next? And how will it help improve the game-day experience for fans while also helping the venue business operate more efficiently or profitably?

Answering those two questions seems to still attract new readers from our relatively small addressable audience, which includes at its core the very people responsible for making stadiums safe for selfies — and all the other things that require connectivity, a list that keeps growing without apparent end.

BORN THE SAME YEAR AS LEVI'S STADIUM

It's not a coincidence that the first of our quarterly Stadium Tech Report issues came out the same year that the San Francisco 49ers opened their new home in Santa Clara, Levi's Stadium. While you can certainly debate whether or not the team did well for its fans by moving to the South Bay, what's undeniable is that the stadium's focus on technology to improve the game-day experience started the era of the connected venue, helping to improve the game-day experiences for fans everywhere.

Yes, other pioneers like their neighbors to the north at the baseball stadium now known as Oracle Park had led the initial charge toward public connectivity. But the breadth of the Levi's Stadium vision — including the revolutionary commitment to under-seat antennas for Wi-Fi — put a stake in the ground that caused others to follow. While some of the elements of the Levi's Stadium opening-day vision did not

exactly survive — like the promise of mobile-ordered concessions delivery to every seat in the stadium — the overall idea behind Levi's Stadium, that technology could and should be used to help fans enjoy themselves better, was correct.

Along the way, venues old and new took the Levi's Stadium idea and ran with it, first with finding ways to make connectivity better for fans, and then finding ways to use it themselves to provide even more amenities. Innovation came from companies both large and small around the stadium-technology edges, as people tried different ways to use technology to do things like make it easier to park, check a ticket, and buy a hot dog and a beer.

Like Levi's Stadium, not all of the ideas survived and some (like mobile ordering) are still in a state of flux and experimentation; but also like Levi's Stadium the overall mission in the world of stadium technology deployment is clear: Yes, you should not only have Wi-Fi in stadiums but you should also have as much technology as possible to eliminate the kinds of problems that happen at scale, like long lines to get into a stadium, or half-hour waits at a concession stand.

FORCED BY THE HAND OF COVID

For several years, in any sport there were venues that were technology laggards and slow followers, and budget-conscious stadium operators

who couldn't see the value of investing a lot of money in technology for a place that was only open six or seven days a year. The "don't fix what isn't broken" argument worked for some who didn't want a lot of change.

And then Covid-19 arrived, and when fans were allowed back in stadiums a lot of those old ways of doing things wouldn't work anymore.

In the small time since stadium shutdowns ended, the pace of stadium technology acceptance and deployment has accelerated immensely, for both social and business reasons. Digital ticketing, which had not yet been fully adopted, became the only way to get into the arena, overnight. Cashless concessions, another technology wish-list item that was seeing some experimentation pre-pandemic, also quickly became the only way to do things.

The need to eliminate lines speeded up the development and deployment of walk-through security scanners and checkout-free concession stands. As we all hope and pray that we don't see another worldwide pandemic ever again, one thing we're not giving back in its aftermath is the new attitude and faster adoption of more and more technology to help make stadiums safer, more fun, and easier and cheaper to operate. Fans have seen it, and like the changes. It's here to stay.

WHAT'S NEXT?

When we started doing this thing 10 years ago I had no idea that by now our publication would be writing about network-connected toilets or facial recognition systems that allow fans to buy a beer by smiling at a screen. Back then, just having enough bandwidth to send someone a photo from the arena was a victory.

But I wouldn't have written off the idea, either. One of the most interesting things about stadium technology is that stadiums almost always have to bend and twist existing technology to make it work under the non-standard operating conditions known as "game day," which is like holding a Super Bowl party but inviting 75,000 of your closest friends. Good luck keeping the cooler filled.

Getting the answer about how stadiums do that was interesting 10 years ago, and it's even more interesting now. Thanks for reading, and thank you to our sponsors whose support allows us to go along for the ride, meet lots of great people, and tell their stories. May it keep being as fun as it's been so far.

STR
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STADIUMS EMBRACING SELF-SERVE BEVERAGE TECHNOLOGY

Carolina Panthers fans order drinks from a TendedBar system. Credit: TendedBar
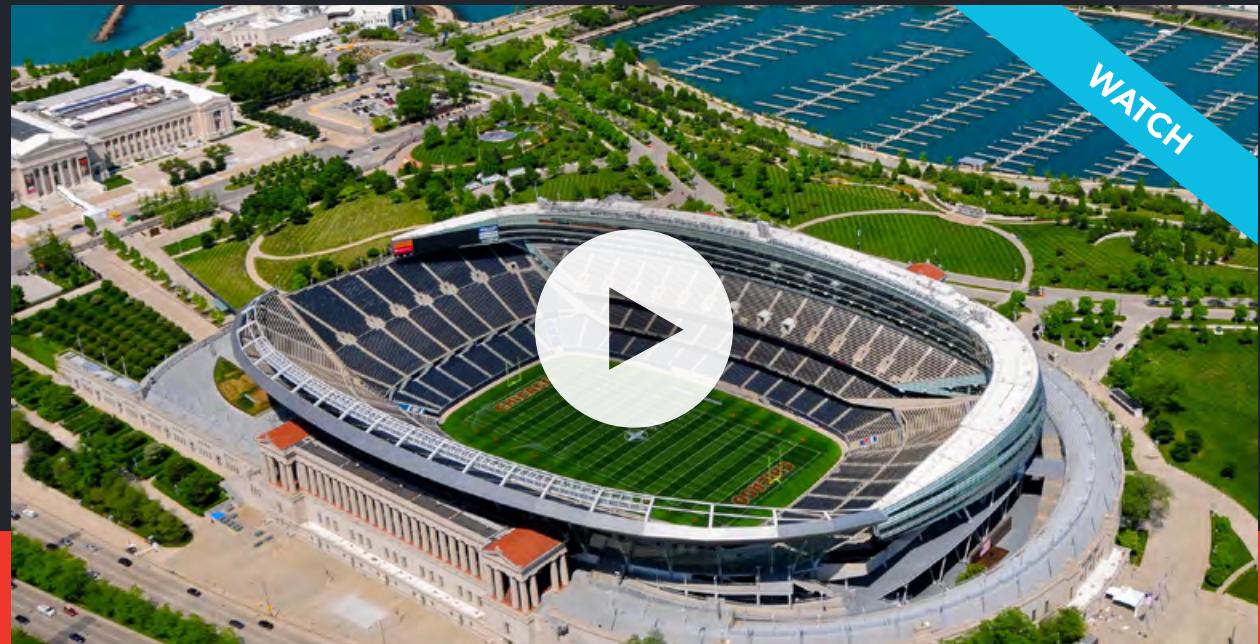
\\ BY ERIC FISHER

The decades-old stadium and arena refrain of "beer, here!" from exuberant hawkers, a sound almost as ingrained with the in-person sports experience as the roar of the crowd itself, is increasingly being joined by a transformative wave of self-serve beverage technology.

Mirroring a rising trend of consumer-directed and automated experiences in many other areas of commerce, such as checkout-free stores, self-serve beverage technology has now reached several dozen major stadiums and arenas in North America, allowing fans to purchase both alcoholic and non-alcoholic drinks themselves, often in a matter of mere seconds.

That technology has arrived in numerous individual forms, ranging from high-end vending machines focused on canned beer to virtual bartenders capable of producing a wide variety of mixed drinks and cocktails.

But in each instance, the core goals from deploying that technology are essentially the same: reducing wait times that remain a key pain point in the overall fan experience, curbing product waste and spillage, and generating additional revenue for stadium operators and partner concessionaires.

MORE OPTIONS MEANS MORE SALES

"There's clearly been a shift toward automated, unmanned solutions for food and beverage, and we're part of that wave," said Corey Yantha, founder and chief executive of Dispension Inc. Dispension, a Canadian company that last year introduced its SmartServ beverage technology at Dodger Stadium, home of Major League Baseball's Los Angeles Dodgers for the league's 2022 All-Star Game, is now finalizing installation deals with two other pro venues.

SmartServ has focused on self-serve beer in large-format cans typically around 24 ounces.

SmartServ vending machines at Dodger Stadium. Credit: Dispension Inc.

> "Conversion rates are really important to these venues. And by increasing points of sale, and reducing congestion and lines in the concourse, people are going to spend more," Yantha said.

Given the confined spaces at many stadiums and arenas and the need to maintain fan flow for safety reasons, simply increasing beverage points-of-sale in a traditional, manned sense is frequently not possible. But the automated self-serve beverage technology, typically taking on the form of a large vending machine or a portable van-sized cart, is often placed along otherwise blank concourse walls and in previously unused corners of venues.
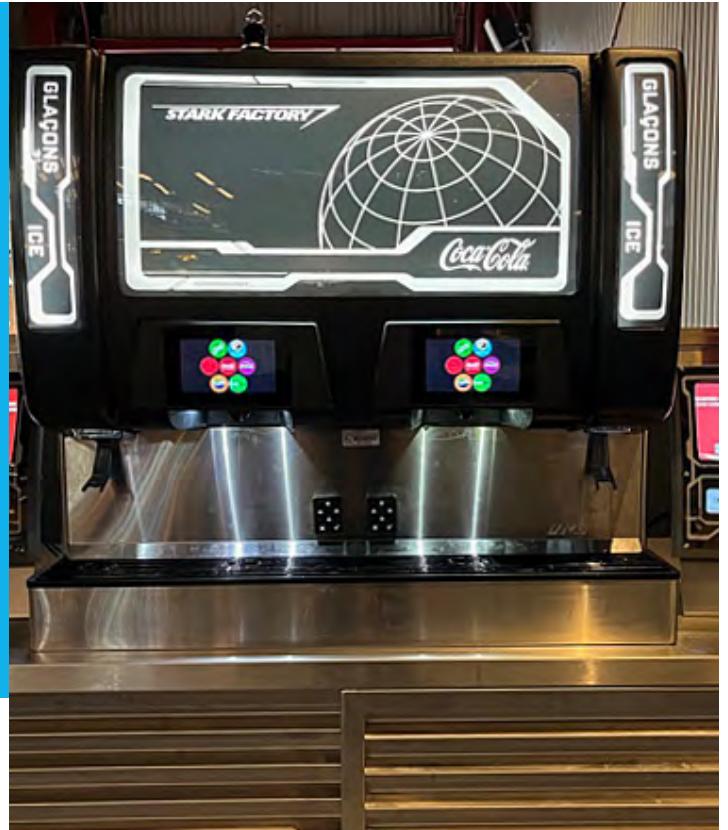
"The mobile self-serve space is definitely something where we're seeing particular growth," said Ben Maphis, vice president of technology for Sestra Systems, a Virginia-based company working with a dozen venues, including Gillette Stadium, home of the National Football League's New England Patriots, and Levi's Stadium, home of the NFL's San Francisco 49ers.

COVID-19 AS AN ACCELERANT

While the roots of self-serve beverage technology go back in earnest at least a decade, and perhaps beyond that to traditional vending machines, it was the Covid-19 pandemic that really helped catapult these offerings to the forefront.

With most venues unable to host fans for at least a year during the worst of the public health crisis, vendors of all stripes that serve those buildings were left with vast amounts of extra time for research and development. And when attending fans began to return in full in 2021, many concessionaires found that restaffing to full, pre-pandemic levels a marked challenge.

"There were a lot of people sitting around [during the pandemic], and we looked to use that time [to develop its systems]," said Justin Honeysuckle, chief executive of TendedBar, a Florida-based provider of automated systems that produce custom-made cocktails.

This page: Self-serve beverage systems employ different but easy user interfaces; Facing page: A Sestra Systems beer dispenser at Levi's Stadium. Credit: Jin Woo, STR

TendedBar is now in nearly a dozen major venues, including Bank of America Stadium in Charlotte, North Carolina; TIAA Bank Stadium in Jacksonville, Florida; Empower Field at Mile High in Denver; Allegiant Stadium in Las Vegas; and Circuit of the Americas in Austin, Texas, with several other new accounts in active development.

Adds Dispension's Yantha, "We knew there was a big opportunity to distribute canned beverage in stadiums, where there was a lot of challenges with congestion, long lines, and staffing issues, which grew over the course of the pandemic."

But as matchmaking between vendors, teams, venue operators, and concessionaires increased during the pandemic, those vendors still found resistance in many
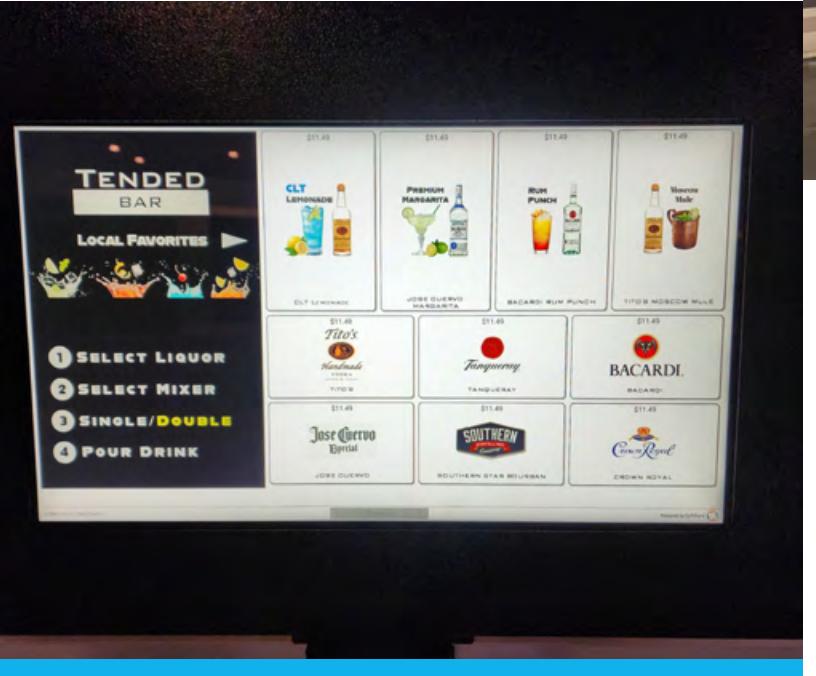
sectors from a sports industry still tradition-bound in many ways.

And despite existing challenges in serving fans in a timely fashion, providers of self-serve beverage technology often find their biggest competitor isn't another vendor, particularly as many of the key competitors have staked out their own specific lanes within this burgeoning space.

Rather, the primary competition is often a regular bartender or manned concession stand.

> **"The biggest thing we're competing against is the status quo, both at the back end, and with consumers,"** Honeysuckle continues. **"Changing processes is initially difficult, and there's a bit of an initial learning curve compared to throwing ice in a trough and putting bottles out on a counter."**

As that product differentiation between different self-serve technologies continues to codify, the willingness among various technology providers to service and

sell different type of beverages has also increasingly varied. Some vendors and systems openly embrace all types of alcoholic and non-alcoholic drinks, while others have found that soda and water don't have a sufficient profit margin for the revenue-sharing agreements many of the self-serve companies have with concessionaires and venue operators.

"We're there to help the clients make the most money possible," Honeysuckle said. "Selling a 42-ounce soda for six bucks isn't the market we're trying to have compared to selling $20 liquor drinks."

DIFFERING AUTHENTICATION TECHNOLOGIES

With any self-serve beverage technology providing alcohol, the foremost question is how to deliver that product, but maintain age verification and comply with local laws.

Initial age-verification systems in this area relied in on RFID-based technology, wristbands, and pre-registration. More recent applications, however, have largely shifted to age-gating based on facial recognition, typically deployed in combination with user driver licenses or other identification that matches photos on those IDs with real-time facial scanning as that user approaches the beverage machine.

But there are additional operational and legal concerns

"In the alcohol world, it's not just, 'are you 21?' It's also, 'are you not drunk?'," said Jose Hevia, chief executive of DraftServ, a Georgia-based company that made an initial splash with its automated beverage system at Major League Baseball's 2014 All-Star Game, and has since moved into an Internet-of-Things (IOT) model of helping teams and concessionaires automate and connect existing beverage systems.

Yantha and Dispension, which initially built its corporate base by developing kiosks to safely distribute a variety of regulated products, are now developing a patented solution called Intoxivision that uses thermal imaging to determine in a contactless fashion whether or not a consumer is intoxicated. The company is looking to introduce that emerging technology by the end of 2023.

But in the short term, many self-serve beverage systems still require some manned support and monitoring, not unlike how self-scanning lanes at a grocery store that have on-floor management present to help shoppers.

"There's still an oversight component to self-serve alcohol systems that won't be fully automated in the near future, particularly from a liability standpoint for venue operators," Hevia said.
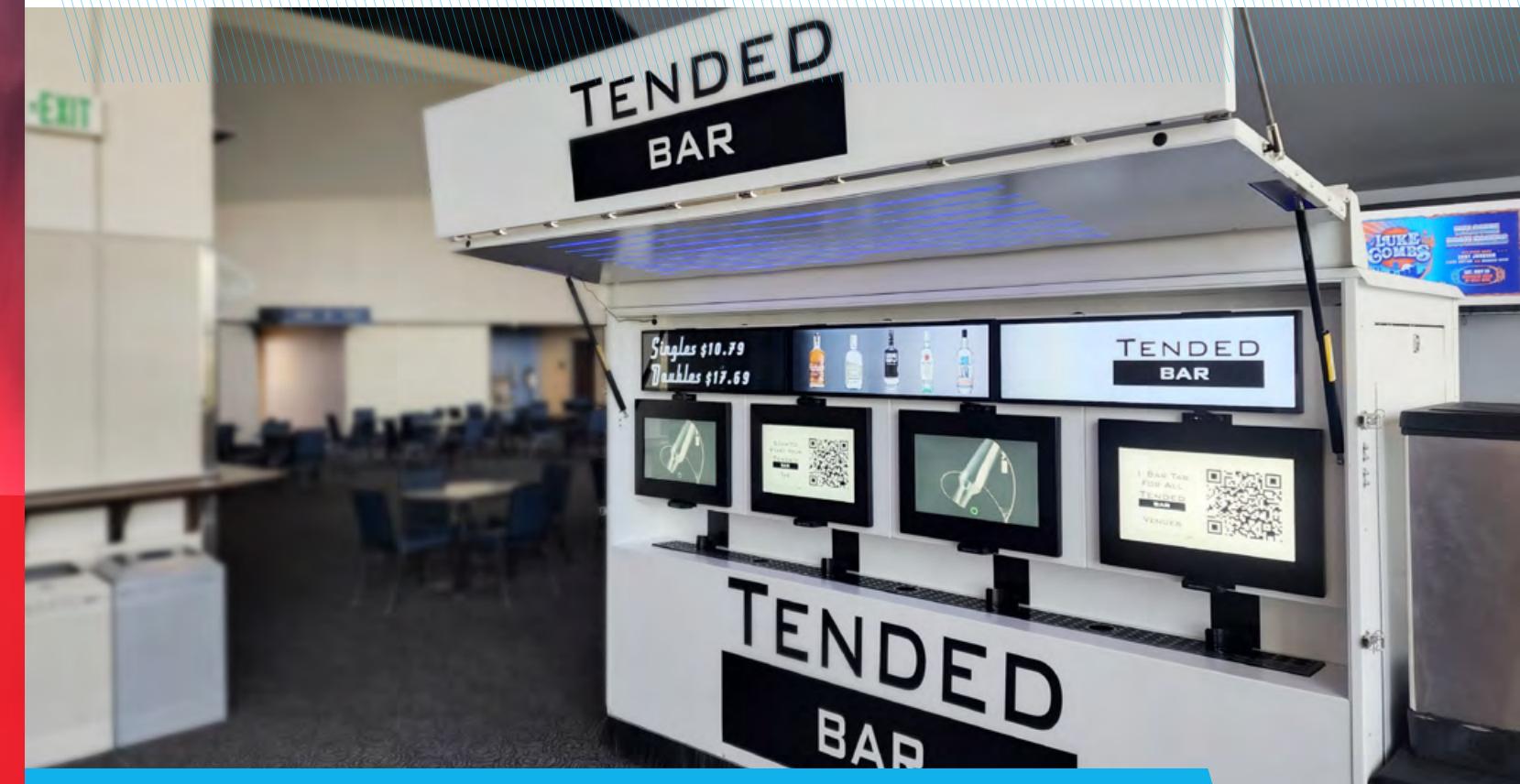
PERFORMANCE IMPROVEMENTS OVER OLD METHODS

Not surprisingly, the self-serve beverage systems often offer a sizable difference in performance improvements compared to traditional methods. TendedBar, for example, claims a throughput rate of 35 people per five minutes at a single, four-screen bar. Such a delivery rate, combined with the level of drink customization that the system provides, would be hard to match in a normal, manned setting.

"That number stands by itself in a high-volume environment," Honeysuckle said. "And we're making a fresh drink every time."

NETWORKS FOR A SUSTAINABLE FUTURE

CommScope is committed to advancing networks with a vision for producing innovative technology that can play a vital role in creating a sustainable future.

Several self-serve beverage system providers have used portable systems for ease of deployment. Credit: TendedBar

At many venues, though, the self-serve technology is not simply about improving speed of service or overall revenue, or necessarily those factors at all, but also about offering a differentiated level of fan experience. Other systems such as DraftServ place a high priority on curbing spillage and waste and maximizing product yields from beer kegs and other beverage dispensers.

"It really depends on what you're trying to solve for," which can vary widely by team or venue, said Alicia Woznicki, vice president of design and development for Aramark Sports and Entertainment, a major concessionaire which works with hundreds of pro and collegiate teams and has actively explored self-serve beverage technology for the better part of a decade. "Are you trying to offer a cool, experiential amenity, or are you trying to get back people back to their seat and happy they have their beverage?"
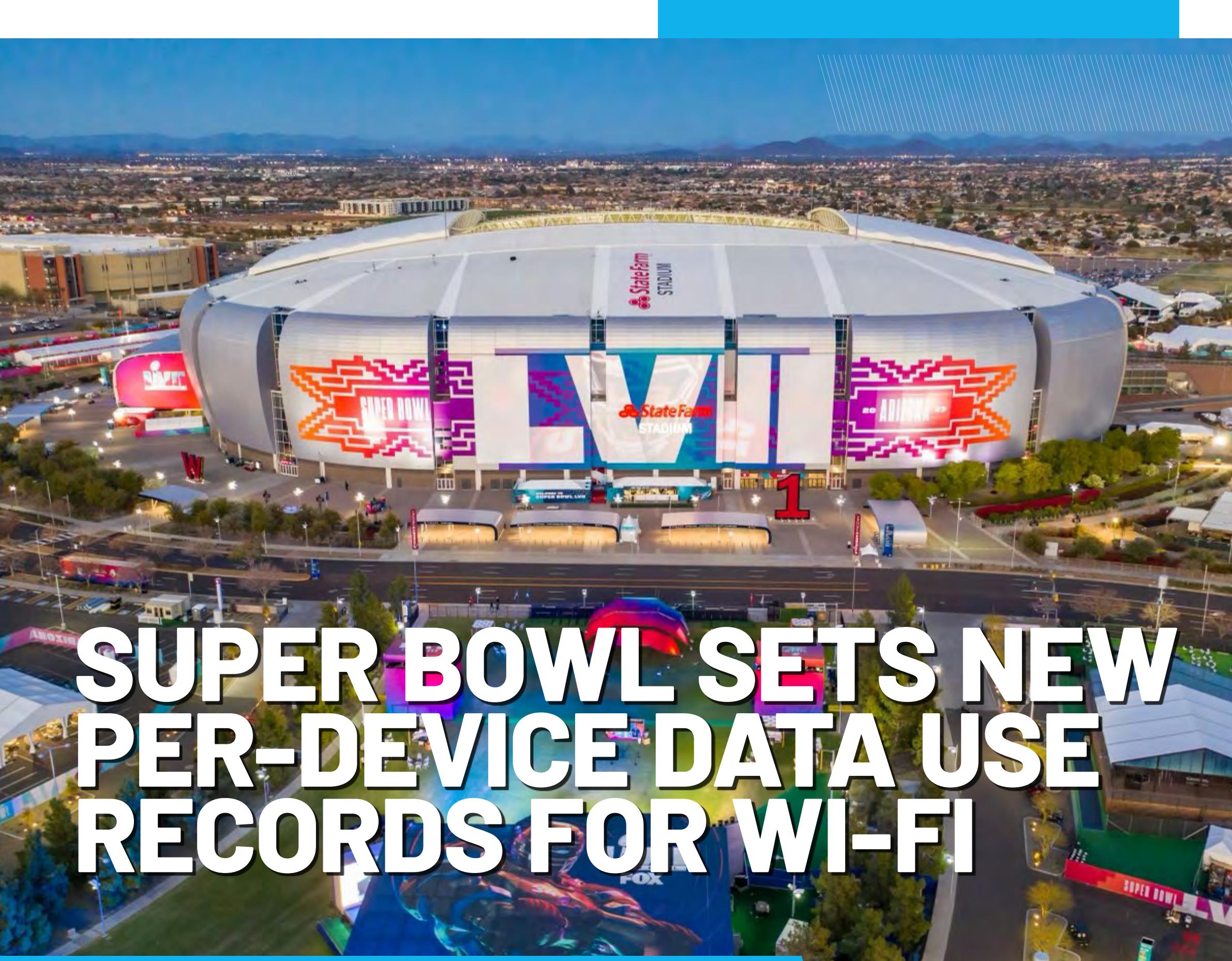
To that end, Woznicki says Aramark's efforts to date in the self-serve beverage space have often seen better performance metrics from efforts that more closely mirror retail and commerce applications outside of

sports venues, such as selling bottled products with checkout-free technology.

"In Asia, anything comes from a vending machine, and people are willing to adopt that," Woznicki said. "But [in North America], we haven't seen the same kind of adoption on the vending [-based technologies] yet that we would have hoped for. So we have to figure what is the right way to set up the solutions, and make sure they don't get lost on the concourse."

Ultimately, self-serve beverage technologies in sports will also borrow heavily from other areas of hospitality and entertainment such as hotels, theme parks, movie theaters, chain restaurants, and airports – all high-volume areas that are key targets for many of the primary vendors in this space.

"The addressable market is so much larger than just sports venues," Honeysuckle said.

State Farm Stadium in Glendale, Ariz., was the host venue for Super Bowl LVII. Credit: State Farm Stadium

\ \ BY PAUL KAPUSTKA

SUPER BOWL SETS NEW PER-DEVICE DATA USE RECORDS FOR WI-FI

The Wi-Fi network data usage at this year's Super Bowl LVII just barely set a new high-water mark for the big game, with 31.5 terabytes used just topping last year's total of 31.2 TB, according to statistics released by Extreme Networks.

And while the event did see a new record in the per-fan usage of data at 643 megabtyes per device, its Wi-Fi mark fell short of setting an overall top Wi-Fi day record due to the 34.8 TB number seen at an Ohio State game this past fall.

All of the statistics are from the game, a thrilling 38-35 victory for the Kansas City Chiefs over the Philadelphia Eagles on Feb. 12, 2023, at State Farm Stadium in Glendale, Ariz. Some of the numbers we did get are worth diving into, especially the very small overall jump in Wi-Fi usage, which can possibly be explained due to several factors.

Pregame ceremonies accounted for one of the peak times of wireless data use. Credit: Verizon

FEWER FANS, BUT MORE DATA PER CONNECTED DEVICE

While historically over the recent past we have been treated to big jumps each year in overall Wi-Fi data usage at each Super Bowl, the smaller attendance at this year's Super Bowl of 67,827 fans (compared to 70,048 at last year's game) was just one factor that likely contributed to the "smaller" overall growth. The Ohio State game that set the new top mark, for example, had 106,787 in attendance.

However, the number we've been paying more attention to at the past few non-Covid events — the average data used per connected device — did show a big jump this year at the Super Bowl, with the 643 MB per device setting a new high mark, besting the 595.6 MB per device set at Super Bowl LIV in Miami in 2020.

Another interesting number to note from this year was the 10 percent drop in "take rate," or the number of fans on the Wi-Fi network out of the total number of fans present. This year's numbers of 48,923 connected devices out of 67,827 total attendance showed only a 72 percent Wi-Fi take rate, down from a high of 82 percent at Super Bowl LVI last year at SoFi Stadium when 57,628 devices connected to the network out of 70,048 total attendance.

Possible explanations for the lower take rate include the lower number of Wi-Fi APs installed at the two stadiums (approximately 1,500 at State Farm Stadium compared to 2,521 at SoFi Stadium), as well as the expanded 5G cellular connectivity installed at State Farm Stadium ahead of the Super Bowl, which did lead to record-breaking jumps in the cellular data used at

the big game. We are still working with the top cellular carriers to see if there had been a significant jump this year in 5G-only traffic, so stay tuned.

But the jump in per-device usage is an interesting one, maybe perhaps due to the increase of consumer devices that support the Wi-Fi 6 standard? According to stats from Ohio State and others, pure Wi-Fi 6 traffic has been increasing lately, which may mean that the touted attributes of the Wi-Fi 6 standard are finally flexing! We have asked Extreme to see if they can provide Wi-Fi 6 specific numbers, so stay tuned.

As we detailed in our Super Bowl wireless preview, the new Wi-Fi 6 network at State Farm Stadium uses gear from Cisco, including the new Cisco 9104 antennas which provide farther-reach coverage that allows for placements on structures farther away from the fans. So why do we quote Extreme Networks for statistics? That's because official Super Bowl Wi-Fi usage numbers are supplied by Extreme under Extreme's deal with the NFL as its Official Wi-Fi and Wi-Fi analytics provider.

PREGAME, HALFTIME CAUSE PREDICTABLE SPIKES IN TRAFFIC

According to Extreme the network also saw a record peak throughput rate of 25.8 Gbps, topping last year's record mark of 20.7 Gbps. The Extreme release did note that "The peak spike in bandwidth occurred when teams were announced and entered the field," with 193.5 GB recorded at that time. The Extreme release also said that the halftime show featuring Rihanna and singers on the amazing airborne stages "drove a 450%+ increase in bandwidth usage" on the Wi-Fi network.

Extreme also broke out data into an infographic showing the top apps used in several categories. In sports apps, ESPN was first, followed by the NFL, while Facebook lead the social-media parade followed by Instagram, Twitter, Snapchat and Reddit in descending order. Apple, YouTube and Disney were the top three streaming apps, followed by Ring, an interesting addition as maybe fans at the game were checking their front doors remotely? Netflix came in fifth in streaming apps, which in the past Extreme execs had said could be due to fan groups with small children, who may prefer their favorite shows to the football game.

VERIZON, AT&T BREAK RECORDS FOR BIG-GAME CELLULAR DATA USE

One the cellular side, any doubt that wireless data usage at big events is continuing to grow was put to rest, when Verizon and AT&T reported at combined 68.8 terabytes of data use in and around State Farm Stadium during Super Bowl LVII — about 58 percent more than the total seen last year.

Both Verizon's reported mark of 47.8 TB and AT&T's total of 21 TB set single-day records for each of the cellular carriers. Last year at Super Bowl LVI at SoFi Stadium, Verizon reported 30.4 TB of data and AT&T saw 13 TB of data for a total of 43.4 TB to set the previous high-water marks.

We will attempt to find out more granularity around the data, but our guess is that the 5G network investments made by the carriers may have been partially behind the big jump, or at least a factor in the traditional annual data-demand growth that shows no sign of stopping. According to Verizon, 60 percent of the cellular users at Sunday's big game were Verizon customers. T-Mobile did not report any statistics from the game.

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Rihanna's stunning halftime show caused a big spike in wireless data use. Credit: State Farm Stadium

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VENUES, FANS EMBRACE CHECKOUT-FREE CONCESSION STORES

\\ BY PAUL KAPUSTKA

When fans filter into T-Mobile Park in Seattle this year for Major League Baseball's midsummer classic, they will have a chance to see the newest concessions All-Star — checkout-free stores — in action.

Three new Amazon Just Walk Out markets join one that was launched last season. The home of the Mariners has joined dozens of venues using checkout-free

deployments to transform the food and beverage experience. Markets from providers like Amazon and Zippin allow fans to select products from store shelves and then bypass the checkout, automatically charging their preferred form of payment for their selection. The promise of this technology is a fast, accurate, frictionless commerce experience.

The rapid acceptance of cashier-less technology by venues and their fans is a sign that after years of failed

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promises, the concessions technology revolution is well underway. This *Stadium Tech Report Market Report* will focus on check-out-free stores. Who are the providers, how do they work, how do they benefit venues and guests, and what challenges they pose for the concessionaires.

WHY CHECKOUT-FREE: FASTER SERVICE, MORE REVENUE

For years, fans have accepted long lines, slow service, and inaccurate menus as part of the stadium concessions experience. Empowered by consumer behavior changes post-Covid, stadiums are deploying multiple technologies to speed up and improve the process. While there were experiments before the pandemic, preferences for social distancing, fewer lines and less human interaction have ignited an explosion of new concession technology.

Any fan who has been to sporting events in the past can easily grasp the benefits of a checkout-free concession stand. Instead of having to wait in a long line, missing critical chunks of the event they paid to attend, they can obtain food and drinks in seconds rather than minutes.

While the fan's first engagement with such a store can be confusing, the learning curve is rapid, with many fans finding they can visit a concession multiple times simply because they're back in their seats so quickly. The technology adds an element of surprise and fun to something that is is otherwise an everyday activity, prompting some fans to stop and take photos or videos of their checkout-free experiences.

This page: A rendering of a counter-top version of a Zippin store; previous page: A Zippin store at Tropicana Field. Credit both photos: Zippin

For venues, the checkout-free stand is a godsend in an era where it's increasingly hard to find enough people to fully staff a stadium for game days. Instead of needing a full team of order takers and food runners to process orders, checkout-free stands can operate with as few as one or two outside staff offering instructions to newcomers and to checking IDs for alcohol purchases.

Not surprisingly, with faster transactions, checkout-free stands are showing increased per-cap revenues according to early adopters who have shared prelimanary statistics.

Aside from the staffing and speed benefits, some venues are finding opportunities to apply the technology to previously unused space. By deploying the slimmer versions of stands that focus on drinks and prepackaged snacks venues are generating new revenue. At Barclays Center, where the venue has deployed several Zippin-powered stands, Zippin execs claim that stands built under vacant stairwells now generate as much as $10,000 per stand per event.

HOW DOES IT WORK?

If you're not familiar with checkout-free stores, here's a quick primer. Customers are allowed to enter stores by scanning a credit card or some other pre-authorized payment method. After entring the store's gate they simply take the items they want off the shelves and then exitPayment takes place online after they leave the store.

In stadiums, the setup typically involves a secured area accessed via a set of gates (similar to public-transportation turnstiles) through which fans enter and exit. Entry, requires the fan present some method of identification linked to a payment card — this can be a physical credit card; a team/venue app; or with Amazon you can even use your palm assuming you've pre-register for their Amazon One service. When the gate turns green you enter, select your items and leave through the exit gates.

What happens while you are there? A network of overhead cameras tracks customer activity. Camera data is paired with an artificial-intelligence engine that visually matches selected items to a pricing database. Some companies add shelf sensors to provide additional data and to improve accuracy. All providers claim their technology is accurate even if customers pick up an item and put it back. According to the companies, the cameras do not use facial recognition or any other type of permanent identification Instead, they match activity with a customer "shape" that is linked to the entry transaction.

While these systems promise to greatly reduced staffing requirements in venues, some live staffing is required. Staffing is present to help consumers who have not used the stores before, and to check IDs for alcohol purchases.

WHO ARE THE PLAYERS IN THE MARKET?

In the stadium market, the two leading providers of checkout-free stores are Zippin with 56 stores, and Amazon with 40. But the stadium-specific deployments are just a small slice of the overall market for checkout-free technology, which has attracted a strong field of global competitors.

Amazon's deployment of the technology in some of the full-size Whole Foods stores is well publicized but other providers have deployed checkout-free technology in full-size stores, convenience stores, gas stations, college campuses, and on airport concourses. Here's a quick rundown on the leading providers of checkout-free technology so far:

AMAZON

As the owner of the Whole Foods grocery chain, Amazon's Just Walk Out technology is designed for more places that just stadium stores. That said, like some other providers Amazon is probably finding stadiums to be a good place to test systems since you don't have to build out an full-size store to start getting some results. At last count Amazon had 40 open or announced stadium stores, including four outlets at each of the large venues close to its Seattle headquarters — Climate Pledge Arena, Lumen Field, and T-Mobile Park. www.aboutamazon.com

ZIPPIN

A San Mateo, Calif.-based startup, Zippin is the leader in stadium-specific deployments, with 56 such stores at our last count. Zippin last raised funding with a $30 million round in September of 2021, putting its total venture funding at $45 million. In January Zippin introduced the Zippin Walk-Up, a design that combines checkout-free technology with an existing concession stand, with no physical change needed to the stand. www.getzippin.com

AIFI

The Santa Clara, Calif.-based AiFi, which is backed in part by Verizon Ventures, raised $65 million in a series B round in March 2022 for a total of $80 million raised so far. Currently AiFi has six known permanent store deployments, along with some portable stores. AiFi recently signed a deal to provide checkout-free stores at the Intuit Dome, which is scheduled to open next year. www.aifi.com

STANDARD AI

Formerly known as Standard Cognition, this San Francisco-based firm has been around since 2017, with more than $230 million of funding raised so far. In addition to launching its technology at convenience stores and campus stores, Standard AI is used at two stadiums — American Airlines Arena in Dallas, where there are two Standard AI stores, and at one store at Polar Park, the home of the minor-league Worcester (Mass.) Red Sox. www.standard.ai

TRIGO

The Tel Aviv-based Trigo has partnered with several large grocery chains in Europe and the U.K. to deploy its checkout-free technology, including Tesco in the U.K. and ALDI in the Netherlands. Trigo raised an additional $100 million in venture capital this past October, bringing its total venture funding to $204 million. It currently has no known stadium stores using its technology. www.trigoretail.com

GRABANGO

The Berkeley, Calif.-based Grabango has deployed its checkout-free technology in several convenience store chains, including Circle K and AM/PM. The company raised $39 million in a series B funding round in June 2021, putting total funding near $94 million. It currently has no known stadium stores using its technology.
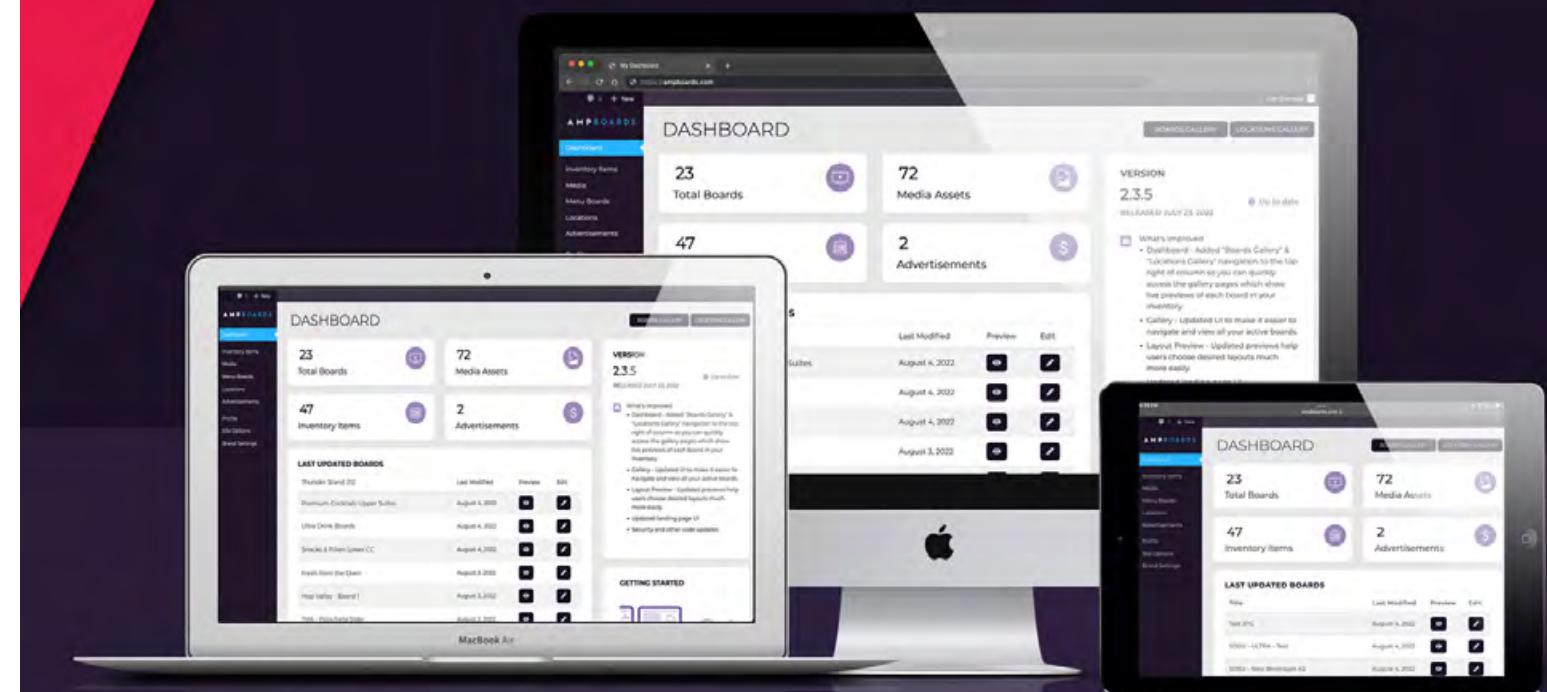
www.grabango.com

UPFRONT DEPLOYMENT COSTS A CONCERN FOR SOME VENUES

While the number of sports-specific checkout-free stands seems to still be growing rapidly, the technology is not a slam-dunk for all venues. The biggest drawback, according to sources at several venues, is the upfront cost of the stores. Deployments require special cameras and sensors and can also require extensive physical renovation of stadium spaces.

For a full-size checkout-free store, offering not just drinks but hot food selections and merchandise, physical renovation costs may run $300,000 or more, according to several sources. In addition to designing for the entry and exit gates and putting in overhead cameras and shelf sensors, the stores must have ways for staff to provide fresh-cooked food or to stock coolers, preferably from the back so that staff is not interrupting customer flow.

Some providers, especially Zippin and AiFi, have responded to the cost concerns by designing smaller stores, like the "drink lane" design This concept encapsulates a line of beverage coolers or a short bar featuring pre-filled drinks, coupled with a shelf or two for prepackaged snacks.

This January Zippin introduced an even smaller model of its stand, adding the entry/exit gates to an existing concession counter, with smaller coolers and food shelves perched on the existing countertops. AiFi has a similar model, which incorporates draft beer or fountain drinks poured behind a counter. AiFi has

deployed several of its box-like "popup store" models at venues including Hard Rock Stadium in Miami, Ford Field in Detroit, and at the Indy 500.
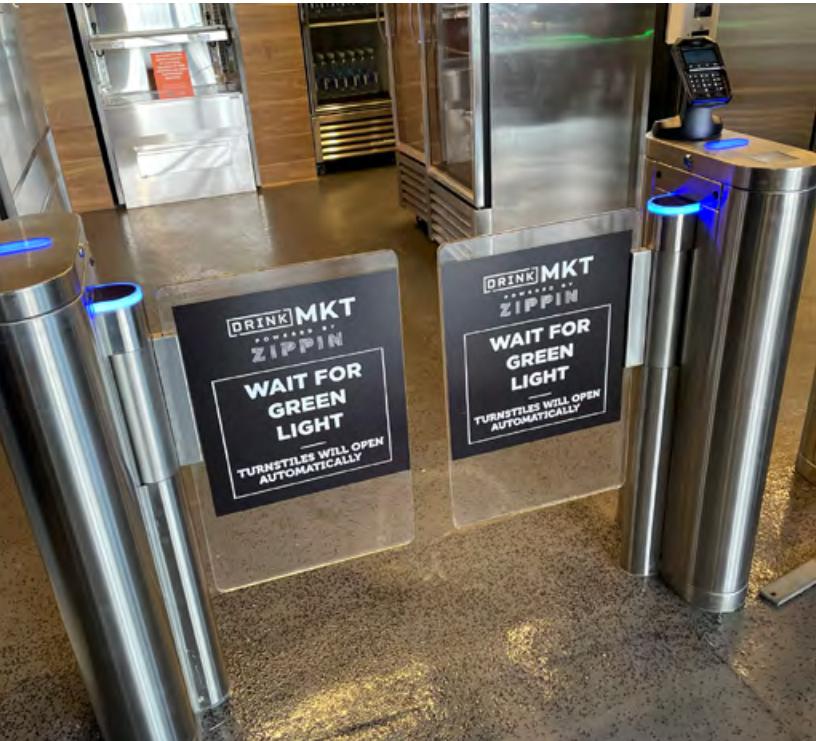
These systems are sold on a subscription model, typically requiring a contract that is a year or more in length. Therefore, venues that only host a small number of events (e.g. college football stadiums and race tracks) may find it harder to find the return from checkout-free technology. The hope for the vendors is that their smaller-sized options may be priced reasonably enough for venues to be willing to kick the tires and see if the benefits are worth the upfront investment.

REFINING PLACEMENT AND ADDING MORE STORES

While the technology providers in the stadium space almost all tout their offerings as something that can "eliminate" concession lines, what we have seen in the field is that the popularity of these stands can sometimes create lines outside the gates with fans lined up for a quick transaction suggesting more stores may be necessary to handle demand.

At Denver's Empower Field at Mile High, caterer Aramark experimented early on with a few Zippin stores and now has nine checkout-free stands, the most of any stadium. Since STR began tracking the technology we have seen several stadiums, including Lumen Field and T-Mobile Park in Seattle, start with one stand and then add several more in quick succession. At the new CityPark soccer stadium in St. Louis, early fan acceptance of the three Zippin stores has stadium operators already thinking about adding more in the future.

Placement strategies for stores are also evolving as more live-interaction data becomes available. At Allegiant Stadium in Las Vegas, the stadium placed two sets of Zippin drink stands side-by-side, directly across from traditional belly-up concession stands serving the upper-bowl seating. According to the venue, the Zippin stands completely eliminated long lines at belly-up stands by moving people who only wanted drinks and maybe a snack out of the lines of people looking for something more substantial.

LOOKING AHEAD TO FOOTBALL SEASON

With more expected new deployments to be announced in the coming months, the real expansion for checkout-free stores in the stadium space may take place before the U.S. football seasons arrive in the fall. What will be interesting from a business standpoint is to see if the two stadium-focused startups — Zippin and AiFi — will be able to continue compete with the resources of Amazon. Or, if any of the other players, like Standard AI, Grabango, or Trigo, will expand into the U.S. stadium market.

While checkout-free technology may not be a fit for all types of venue concession operations, it will be interesting to observe over time how many traditional belly-up stands are replaced by stands where fans simply walk through.
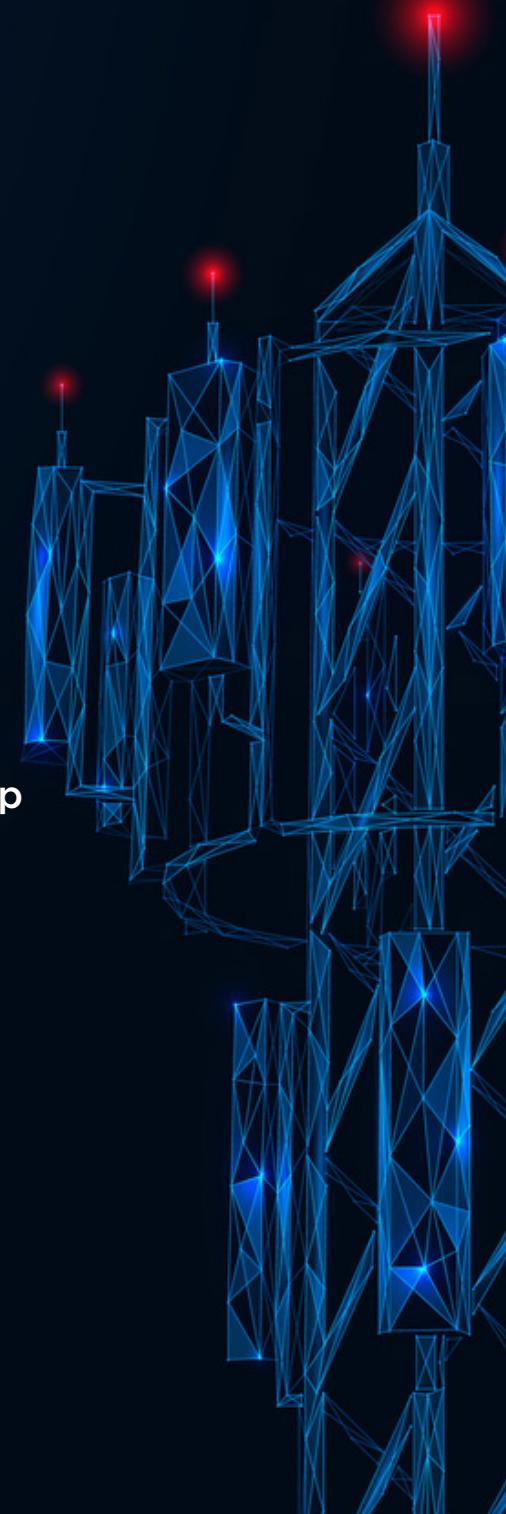
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AmpBoards is a creative and development agency which specifically designs, builds and implements the AmpBoards digital signage and menu CMS HTML solution in large venues and arenas. The powerful platform assists with removing the burden of making menu board and signage updates from Event Day Operators and hands that power to the people who need it most… concessionaires. F&B groups now have the ability to make menu board and other signage updates quickly and easily through an intuitive user interface. AmpBoards currently partners with concessionaires such as Levy, Aramark, Delaware North, VenueNext, Legends and others to build eye-catching menu and signage designs using data and best practices. AmpBoards also currently works with multiple POS and DB providers including SpotOn Enterprise (formerly Appetize), Oracle Micros, Clover/Bypass and VenueNext.

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