

# STADIUM

TECH REPORT

SUMMER 2022



## ISLANDERS' PARADISE

UBS ARENA BRINGS TECH-FILLED 'STADIUM OF THE FUTURE' TO NEW YORK ISLANDERS FANS

## IOT IN RESTROOMS

IOT BRINGS NETWORK CONNECTIVITY TO STADIUM RESTROOM MANAGEMENT

## CHECKOUT-FREE CONCESSIONS

STADIUMS RAPIDLY ADOPTING NEW TECHNOLOGY

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## STADIUM TECH REPORT

Welcome to the second issue of our NINTH year of STADIUM TECH REPORTS, the Summer 2022 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 look at UBS Arena, the new home of the New York Islanders, as well as a look at the new field of IoT (Internet of Things) connectivity in stadium restrooms. We also have a market-research update on the deployment of “checkout-free” concessions stands in stadiums, with updates from the top three providers in the field.

We’d like to take a quick moment to thank our sponsors, which for this issue include Verizon, ExteNet, MatSing, Cox Business/Hospitality Network, Boingo, 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](mailto: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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Paul Kapustka

## WELCOME TO THE NEW STADIUM TECH REPORT, BETTER THAN THE OLD STADIUM TECH REPORT!

Networked restrooms? Podcasts? Concession technology? If you are a longtime Stadium Tech Report reader, you might be wondering what's going on here. But to readers old and new we simply say welcome — welcome to our new coverage strategy, which is really hitting its stride with this current issue of the Stadium Tech Report.

Once again, as we've done now for the past nine years, we've got a quarterly issue full of long, in-depth stories that provide stadium technology professionals with the deep dives they need to inform themselves to help their stadiums and arenas keep up with the times. And while we haven't given

up on our past roots of focusing on wireless networking, as this issue shows we've significantly added areas of expertise to our coverage, including, yes, networked restrooms.

Laugh a bit you might, but the very obvious benefits of bringing networked connectivity to stadium

restrooms are outlined in our topic-opening profile by our reporter Terry Sweeney. Like with the other subjects we now cover closely — including concessions technology and entry/security technology — we plan to keep close tabs on stadium restroom IoT trends going forward, simply because it looks like the kind of thing that — like Wi-Fi — will be taken for granted as we all move forward.

### ADDING PODCASTS TO THE MIX

While we still think our quarterly long-form reports offer a depth of information that you just can't find anywhere else, we are also moving ahead with alternate forms of content delivery, including our new Stadium Tech Report podcast series. While we had some podcasts in the past (you can still listen to them all) until recently we never really had the production resources necessary to support a sustained podcasting effort.

### THAT WAS THEN, THIS IS NOW.

With the recent release of our fourth episode our new series is off to a resounding start, with many new listeners lending us an ear. The production skills of our design team — led by creative director Dan Grimsley and digital designer Jackie Nguyen — have made our podcasts much easier and better to listen to. We also thank our podcast sponsors,

ExteNet Systems and MatSing, for helping provide the resources necessary for our expanded list of interviews.

Stay tuned, we've already got some more good episodes in the can and more scheduled down the line. Available wherever fine podcasts are found — Apple iTunes, Google Podcasts, Spotify — you can now bring STR expertise with you to the gym, in the car, in the plane, or wherever else you can simply listen in.

### HOW TO STAY IN TOUCH — SUBSCRIBE TO OUR NEWSLETTER!

With more new readers and listeners discovering Stadium Tech Report on a daily basis — some via our new content-sharing relationships with the Association of Luxury Suite Directors (ALSD) and the International Association of Venue Managers — as well as through the continued growth of social-media sharing of STR content via LinkedIn and Twitter — it may be helpful to know the best way to stay on top of all the new content we are providing: Simply subscribe to our email newsletter.

While you can certainly bookmark the STR home page, or subscribe to our podcast feed, veteran members of the STR audience know that our email newsletter is a simple way to make sure you don't miss anything, since everything we write or record

always gets at least one link from our email feed.

What else do veteran audience members know about our email list? Two important things: One, we NEVER share or sell our email address list. Not to anyone, not to "partners," not ever. Two, we don't blast readers with incessant daily emails in desperate searches for clicks, because that's not our business model. We pretty much send emails only when there is something new on the site or in our podcast series. Why? It's because we know our readers are always busy, and don't have time every day to sift through repeated messages looking for the something new. When you get an email for us, there's usually something you haven't seen before in it.

### GIVE BACK TO YOUR PEERS — TAKE OUR SURVEY!

With all the new content, the podcasts, the new topics, you may ask — what do we charge for all this goodness? The quick answer is, as it has always been — nothing, other than your attention. If there is one thing we do ask for, it's to encourage our audience members who are directly employed by stadiums, teams or venues to take our annual Stadium Connectivity Survey, which will be live in early August.

To better serve our busy audience we have radically shortened our survey for this year, and streamlined it so it can easily be taken on a phone — our trial timing shows it takes less than 3 minutes to complete. For that small effort your answers can help your peers immensely, as while we are happy to write stories about technology deployments there is nothing as good as cumulative data to help provide a snapshot of what venues are doing and why.

And just like our email newsletter, you can be confident that no data from your answers will be identified with your person, team or venue. So join us in our more-content effort with your survey answers, and stay tuned for even more good stuff as we go forward!



# ISLANDERS' PARADISE: UBS ARENA BRINGS TECH-FILLED 'STADIUM OF THE FUTURE' TO NEW YORK ISLANDERS FANS

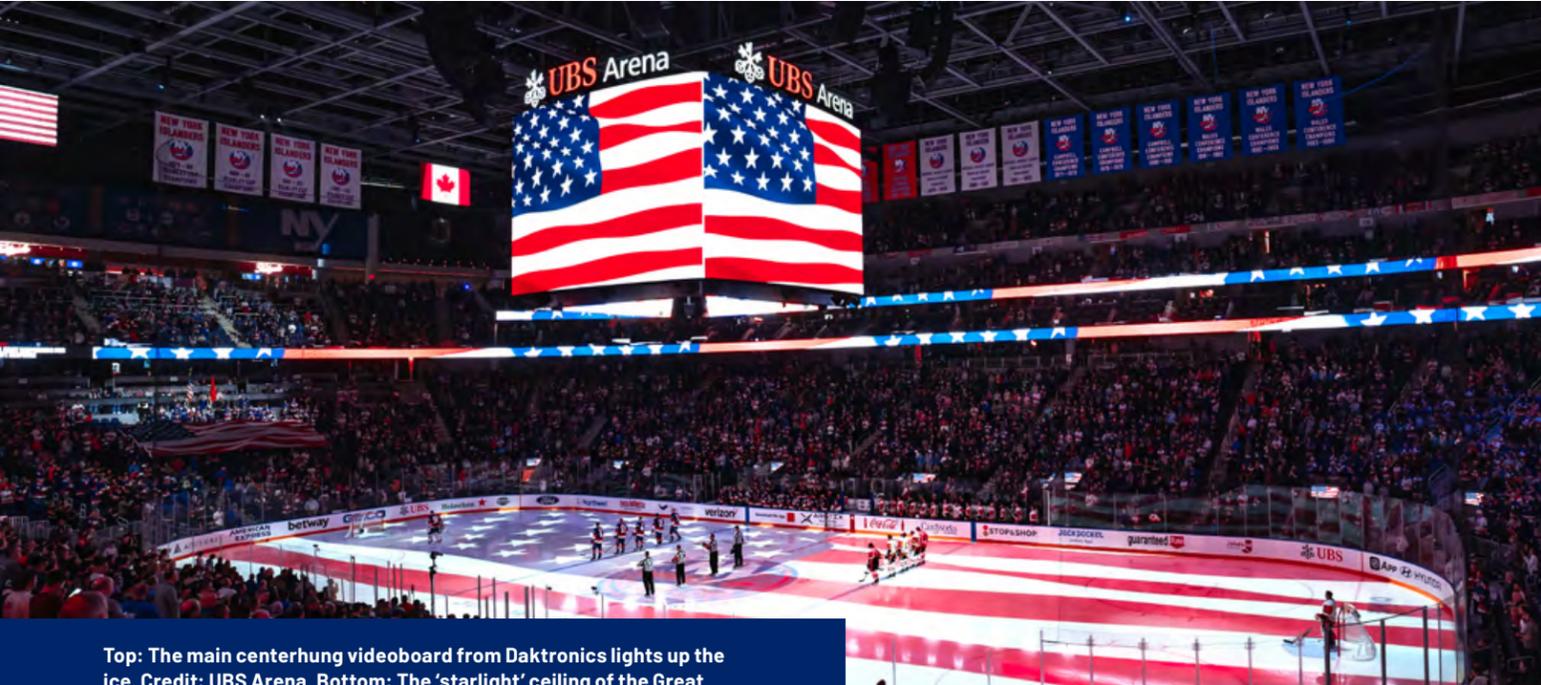
If you're a New York Islanders fan, there is no need to revisit the pain you suffered in recent years when the team struggled to find a reliable, viable home. Not with the opening last year of UBS Arena, a comfortable, tech-filled home for hockey and events that should serve Long Island residents well into the future.

Wireless Networks **VERIZON**  
Wi-Fi Gear **CISCO**  
Cellular DAS Gear **JMA**  
Just Walk Out Concessions Technology **AMAZON**  
Self Checkout Technology **CLOVER**  
IPTV **TRIPLE PLAY**  
Video Boards **DAKTRONICS**

\\ BY PAUL KAPUSTKA

Sitting snugly behind the historic Belmont Park racetrack in Elmont, N.Y., in Nassau County but just to the east of the border of Queens, the new \$1.5 billion project built by the Islanders, Oak View Group and Sterling Equities looks modest from the outside, with its blocky red-brick facade.

Inside the doors the building reveals itself to be a gem, with wide-open architectural features that suggest an old-style railroad station, with classic designs. But the building is also definitely a venue for the future, filled with top-level wireless connectivity, leading-edge concessions technology and other features all designed to use technology as much as possible to improve the fan experience. Wide concourses and club spaces and higher-end architectural finishes complete the comfortable feeling of a "new home" that Islanders fans and Long Island eventgoers can feel proud of.



Top: The main centerhung videoboard from Daktronics lights up the ice. Credit: UBS Arena. Bottom: The 'starlight' ceiling of the Great Hall. Credit: Paul Kapustka, STR

Stadium Tech Report got to visit UBS Arena in early July, during the ALSD trade show and conference in New York City. Our "tech tour" of UBS Arena spotlighted some of the innovations deployed throughout the venue by OVG, the Islanders and technology partners Verizon, Cisco, JMA, Amazon, Clover, Triple Play, and Daktronics.

Though our tour was taken in an empty venue, we were still able to witness and test some impressive baseline wireless connectivity speeds, view the video assets throughout the building and get a live view of one of the newest things to hit the stadium concessions space, Amazon's Just Walk Out technology. Short of seeing them perform in front of a full house, it's easy to see that the sum of the parts of UBS Arena could add up to a first-class fan experience.

**"We have a very damaged fan base, one that came from an arena that was definitely not the stadium of the future," said Ethan Brown, senior vice president, marketing and community relations for UBS Arena.**

"But last year when our season ticket holders walked in for the first time, some of them were crying. They could not believe this was all for them."

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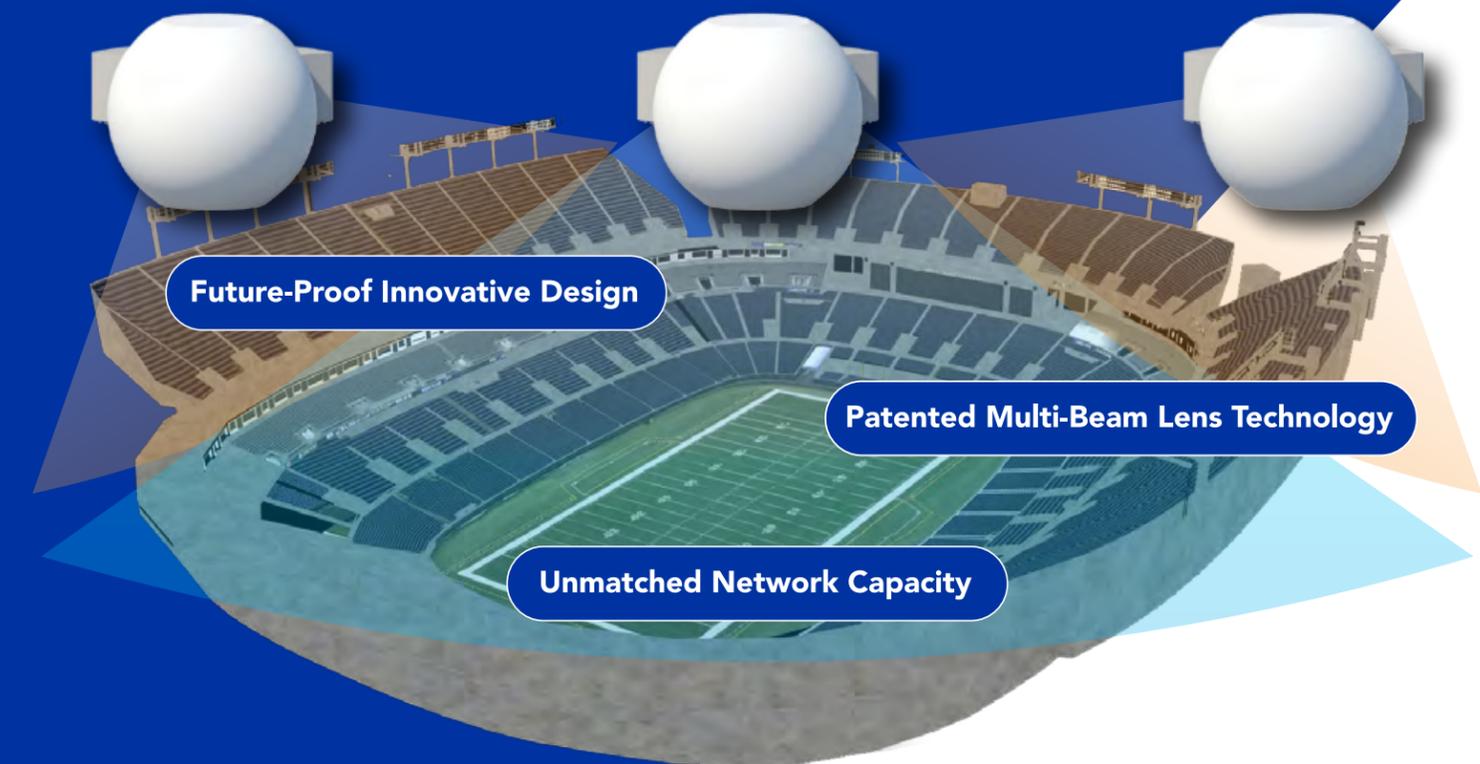
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Top left: JMA gear is used for the cellular network; Right: A look at one of the Amazon stores. Below: Biometric eye-scanning technology keeps locker rooms safe. Credit all photos: Paul Kapustka, STR

arena's main entry. Once inside, the soaring rooftop space of the "Great Hall" (with its star-like ceiling lighting) and the stunning clarity of a large three-sided videobard immediately tell you that this is not just a stadium but a gathering place with style, with the feel of a Grand Central Station from years before. And function follows the form, as the wide, open entry area looks like it allows for easy flow of fans, with multiple staircase, escalator and other pathways to the different seating sections inside.

"When you walk in [to the Great Hall], you get an immediate sense of the majesty," Brown said. "It's also relatively seamless to get fans going in the right direction."

If there is one thing necessary to make the fan experience seamless in venues these days, it's high-quality wireless connectivity. With so much of today's in-game activity reliant on connectivity, both for fans and back of house operations, it's perhaps no surprise that the wireless networks at UBS Arena are at the top levels for a venue its size (17,255 capacity for hockey, approximately 19,000 for concerts). Both the Wi-Fi network and the in-house cellular networks were deployed by Verizon, using Cisco gear for Wi-Fi and JMA Wireless equipment for cellular.

For the main seating bowl, both Wi-Fi and cellular DAS antennas are mounted mostly under seat; according to UBS Arena IT staff, the Wi-Fi network has "almost" 1,000 APs installed throughout the building. And again while we were there in a mostly empty building, we did get Wi-Fi speedtests of 169 Mbps on the download and 182 Mbps on the upload in a lounge space, and a 160 Mbps / 188 mark in one of the premium club spaces just off the main concourse level. A cellular-only speedtest on our Verizon phone in the same area hit 97.9 Mbps / 54.0 Mbps.



According to the UBS Arena IT staff leading our tour, the venue recently installed 12 Cisco Catalyst 9104 Stadium Antennas, also known as the "Marlin" antenna by Wi-Fi insiders, in its overhead ceiling structure. According to the IT staff at UBS Arena the 9104s, which were designed to support much greater distances between antenna and client, are a big upgrade for the venue's

Wi-Fi coverage of the stadium floor for concerts and other non-hockey events. We also spotted a couple of MatSing Lens Antennas in the upper infrastructure, whose similar longer-throw capabilities no doubt assist in cellular coverage for the hard-to-reach seats near the playing surface or for floor seats.



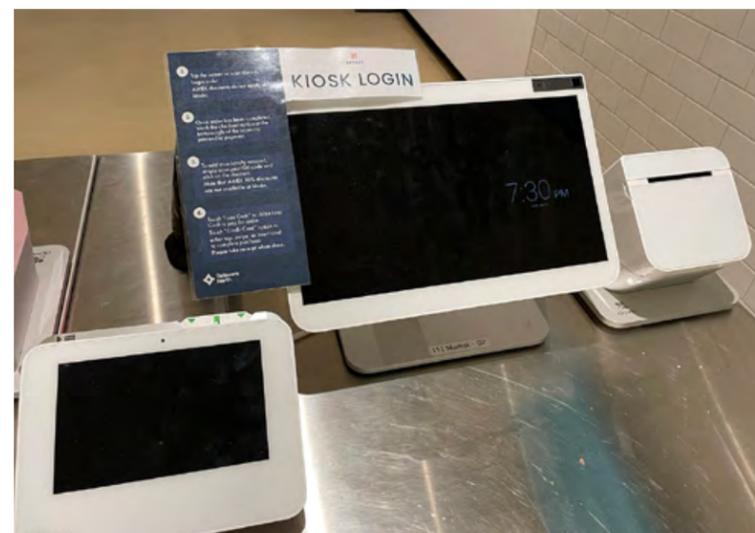
Multiple checkout terminals help keep food lines moving. Credit: UBS Arena

### FASTER CONCESSIONS VIA WALK-OUT AND SELF-CHECKOUT TECHNOLOGY

If there is one thing that differentiates hockey fans (and maybe soccer fans as well) from other sports, it's that hockey fans typically don't want to miss any of the on-ice action, which has fewer built-in stoppages than sports like football, basketball and baseball. To better serve its fans, UBS Arena has put an emphasis on leading-edge concessions technology that aims to significantly reduce the amount of time spent in line purchasing food and beverages.

The most interesting of those is the presence of two "Just Walk Out" stores powered by technology from Amazon. Customers at Just Walk Out stores can simply scan a credit card at the entry gate, enter the store, select the items they want, and leave, with billing taking place online. Such "checkout-free" installations, which are also available at other venues using technology from startups Zippin and Ai-Fi, are quickly gaining popularity among sports fans for their ability to facilitate concessions purchases that take seconds, as opposed to minutes, to complete.

The Amazon stores at UBS Arena, called "On the Fly" in a nod to the way hockey teams make replacements by jumping over the boards instead of waiting for a stoppage in play, came online in April of this year,



Self-ordering and checkout terminals are also a part of the concessions tech stack. Credit: Paul Kapustka, STR

and as such Brown said the venue didn't have a lot of metrics yet on use. Like other implementations of the checkout-free stores, he said fans need a little time to understand the systems – but after trying it once, most come back quickly as they learn the game-changing transaction speed the stores can support.

At other concession stands we saw around the arena, kiosk-ordering and self-checkout systems from Clover are in place, another technology rapidly gaining favor in stadiums. With post-Covid hospitality staffing a challenge at venues worldwide, many stadiums like UBS Arena are finding that a bank of self-checkout systems can not only reduce staffing needs but can also help speed up the overall purchasing process, a win-win for venue and fans.

UBS Arena is also leaning in a direction gaining favor in many stadiums, in offering local-favorite food items in specialty stands, as well as new national brands like Shaq's Big Chicken.

**“We’ve really stepped it up on the food offerings,” Brown said. “It’s a completely new experience.”**

### DIGITAL SIGNAGE PLAYS A BIG ROLE

As befits the overall scheme, the large videoboards inside UBS Arena from Daktronics are stunning in size and clarity, with the main centerhung board featuring 5.9 millimeter pixel spacing for extreme clarity. There is also a very large, three-sided screen just inside the front door ("We call it the 'Z-screen,'" Brown said) that provides a flashy entry welcome as guests enter the arena.

All around the venue, digital displays of various sizes are prevalent, and thanks to the advanced management system from provider Triple Play, they can be configured on the fly to provide custom content tailored not just to the event happening that night, but also to the particulars of the space they are located in. "The IPTV screens let us create a separate experience in specific areas," Brown said. We also saw more digital



Top: Entry system for the Amazon store; Bottom: Wi-Fi APs are under-seat in the main bowl. Credit: Paul Kapustka, STR



displays outside the arena that assist with wayfinding, a nice touch since fans may be coming in from different areas, like parking or mass transit.

There were also a host of smaller technological tweaks that again, added up inside the overall strategy of using technology to improve the experience wherever possible. On the cutting-edge level were devices that used biometric eye scanning for secure entrance (like to the locker rooms) and a neat device in the performers' "Green Room" spaces where entertainers



Left: Cameras that track purchases in the Amazon store. Credit: Paul Kapuska, STR. Right: The team store uses bin-scanning technology to speed up purchases. Credit: UBS Arena.

and their crews could tap their mobile devices on a special receptor which would then share with them the back-of-house Wi-Fi password for the day — eliminating the need to post passwords on paper.

And though we didn't have time to visit the team store, its size and breadth of shopping options are assisted by what Brown called an automatic bin system that can scan all the items a customer brings to checkout without a staffer having to ring up each item separately.

On a more simple level the stadium had numerous device charging stations, in the concourses as well as in premium seating areas and even in restroom lounges — including a women's restroom in the suite level that

has now set the bar for size and comfort, as it comes complete with a lounge with a circular couch and individual seats with mirrors and charging outlets.

**“The idea was to surprise and delight at as many touchpoints as we could,” said Brown, who noted that the issue of “not enough bathrooms” at the old Islanders’ stadium is now something far in the past.**

But some good things from the past — like the Stanley Cup champion banners hanging from the ceiling — and a seating layout that keeps the roof low so top-level seats are positioned right above the ice are meant to make sure the new venue makes the longtime fans feel like they're at a place they'd love to call their new home. “We want the fans to leave here talking about how wonderful the experience was,” Brown said. “And then to want to come back again.”



# IOT BRINGS NETWORK CONNECTIVITY TO STADIUM RESTROOM MANAGEMENT

\\ BY TERRY SWEENEY

**S**tadium and arena owners are hearing the same sales pitch more frequently: Use the Internet of Things to create connected restrooms.

The benefits: Save money on utilities like water and electricity. Reduce janitorial headcount and the personnel budget. Give fans and visitors a superior customer experience rather than subject them to less than deluxe environments.

Particularly in the last 10 years, the push to extend networked connectivity to formerly standalone, passive devices has gained plenty of momentum. In its earliest days, IoT offered a way to network (and get better control

Fixtures of all types are getting increasingly networked to deliver a 'touchless experience' for fans and visitors. credit: Sloan



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of) traffic lights (and traffic), thermostats and light switches. IoT momentum has continued as devices and machines in factories and warehouses get networked as well. It was only a matter of time before the restrooms at sporting venues got IoT'd.

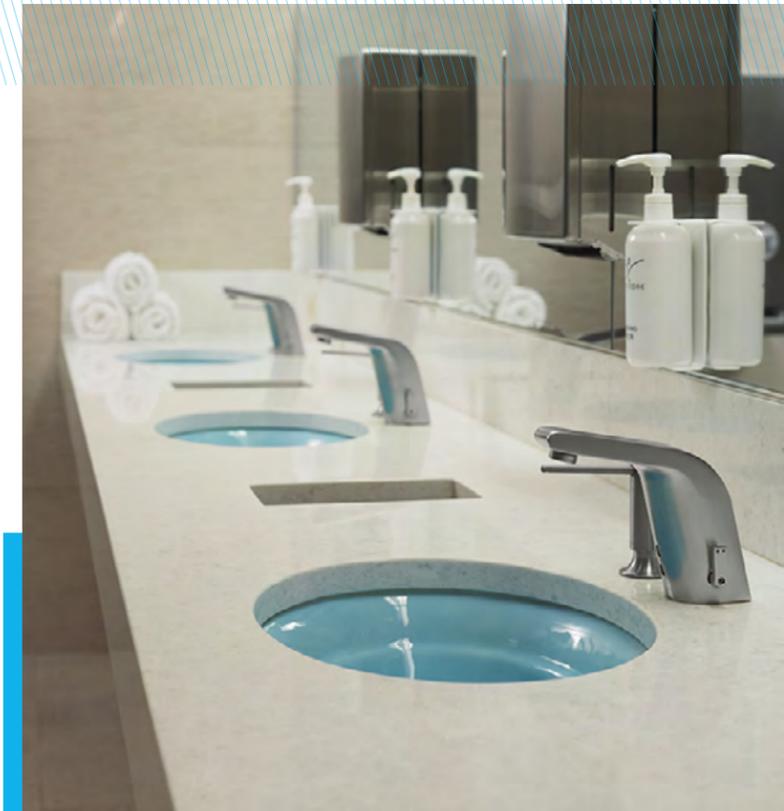
In hindsight, though, equipping soap and paper dispensers, sinks and toilets in restrooms with wireless sensors was a bit of a no-brainer. Cisco, IBM, Intel and others have been evangelizing the connected restroom concept for more than four years. So why have IoT-connected restrooms caught on recently? Everyone in the restroom supply chain – from makers of paper products, bathroom fixtures and soap vendors, not to mention wireless networking vendors – all point to the global pandemic as an awareness-building exercise around hygiene. Covid has dramatically changed the conversation where hygiene and human contact are concerned.

### THE NETWORKED STADIUM RESTROOM EMERGES

Faucets, toilets and other fixtures have already been networked in restrooms at Gainbridge Fieldhouse in Indianapolis, where both the NBA and WNBA teams play. PPG Paints Arena, home of the NHL's Pittsburgh Penguins, has been upgraded with connected restrooms. Other venues like Denver's Empower Field at Mile High; Globe Life Field in Arlington, Texas; and the Chase Center in San Francisco have all followed suit.

The Texas Rangers reworked their restrooms prior to the 2021 baseball season at Globe Life Field. The team installed Georgia-Pacific's Kolo Smart Monitoring System, essentially a management console for connected restrooms that ensures clean restrooms that are fully stocked with toilet paper, paper towels, soap and hand sanitizer.

"This is a state-of-the-art facility that was designed for Rangers fans and event guests to have the best possible experience from the moment they walk through the entrance gates until the moment they leave," said Mike Healy, senior vice president of venue operations and guest experience with the Texas Rangers and Globe Life Field, in a prepared statement.



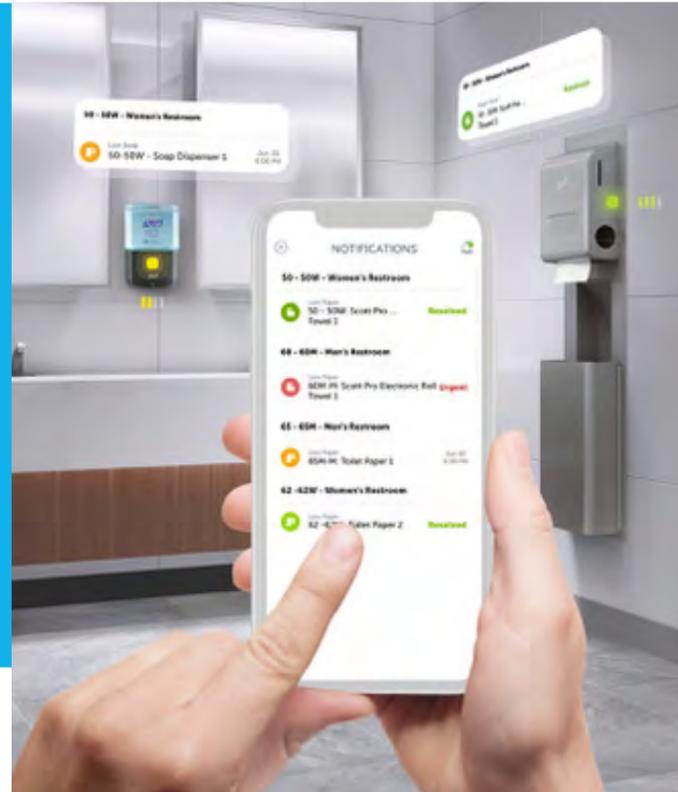
Faucets and soap dispensers are part of the connected restroom of the future.

**“Our own data suggests that how clean and well maintained our restrooms are directly and significantly impacts how fans perceive the rest of our facility,” Healy added. “So it was very important to us to invest in a restroom solution that clearly conveys our facility-wide commitment to cleanliness and the guest experience.”**

### CAN NETWORKED RESTROOMS IMPROVE THE BOTTOM LINE?

So while an improved customer experience and the money-saving aspects of connected restrooms might prove compelling, what if such facilities could actually

help sporting venues make money? That's part of the spin on the IoT sales pitch from Georgia-Pacific. The paper goods company cited a 2015 J.D. Power and Associates study that measured satisfaction levels of users in airports, a useful analog to the transient crowds at sporting venues.



Remote monitoring of restroom facilities ensures a better customer experience. Credit, top left and right, Georgia-Pacific. Bottom photo: Sloan

"They documented that passengers making connections who had a 'good experience' would spend 190 percent more than a dissatisfied one... a crazy number!" said John Strom, VP and general manager of connected solutions, GP Pro, at Georgia-Pacific.

Faye Badger, product line manager, IoT, for plumbing fixture company Sloan observed that each facility has its own particular focus. Stadiums and arenas are looking for labor savings; most want to be able to monitor facilities remotely and change settings as needed.

"With intermittent-use venues like stadiums, during the sport season, or even for a concert, it may not be used for a couple weeks," she explained. That forces the question of how venue operators can monitor

restrooms, flush a toilet, or check a faucet line without sending a person, she added.

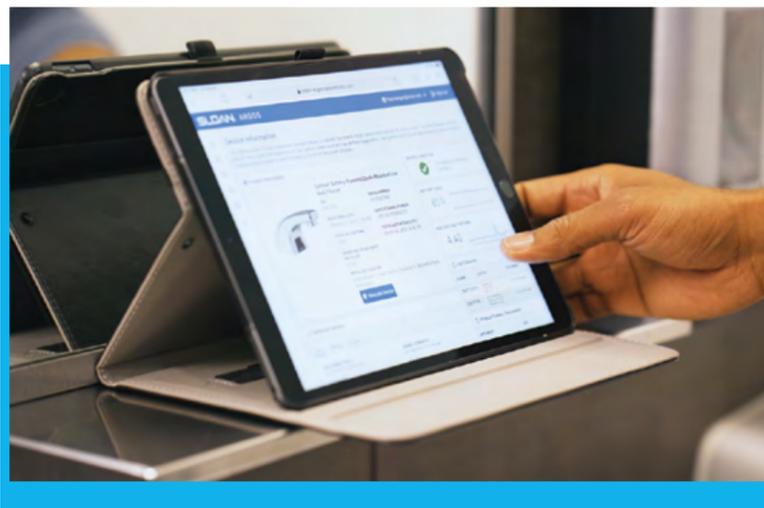
Sometimes there's a stagnant water smell if it hasn't been flushed in a while, according to the Sloan product manager. And no surprise – facilities want to minimize unpleasant odors for health, hygiene and sensory reasons. "Water is also a valuable resource and is drawing far more attention with the droughts," Badger said. Many stadiums and arenas also want to be good to the environment. "They use a whole lot of water every time a toilet flushes."

Another driver is that venues are interested in users-to-handwashing ratios, especially near food facilities. "They're looking for stats and data to make sure employees are washing their hands," to keep things as sanitary as possible, she said.

IoT in restrooms also takes preventative maintenance to a whole new level since venue operators know when restrooms are busiest and how many times a toilet or faucet has been used. Connected restrooms allow them to better predict and perform preventative maintenance to make sure each facility is operating properly for customer satisfaction.

#### HOW THE IOT RESTROOM WORKS

The wireless sensors in connected restrooms draw on Bluetooth and Long Range Radio (LoRa) for connectivity. "Bluetooth is typically the short-range connection, while LoRaWAN is the long distance, low-power connection," explained Donna Quinn, CEO and chairwoman of the LoRa Alliance.



"People like Bluetooth because it's very common," said Dan Quant, vice president of strategic development for IoT electronics equipment maker MultiTech. That familiarity means it's easier to deploy; Bluetooth is also well suited to 1:1 interaction and to connecting with a gateway, but it's typically not suitable for longer-distance communications.



Restrooms are generally hostile environments for RF propagation, according to Sloan's Badger. "You have metal stall partitions; the flush valve is metal; you have a metal faucet, and the controls are often under the sink – it's not very friendly to wireless."

Customer consultations and signal strength measurements help to ensure that connected

restrooms work the way they were intended. "Once we do a few rooms, we get a pretty good idea of a pattern about how it will work," Badger added.

Older buildings with lots of rebar and concrete can be tough environments for wireless signal propagation, noted MultiTech's Quant. "Tinting on office building windows can also be reflective, along with marble and reflective surfaces," creating deployment and operational challenges, he added. "From our perspective, LoRa has been the best solution for that."

#### ADDING RESTROOM CONNECTIVITY SLOWLY

As with other emerging technologies, stadium and arena operators are likely to use a more phased approach to restroom IoT deployment, said Mel Raines, president and COO of Pacers Sports and Entertainment, which owns the Indiana Pacers. The Pacers' arena, the Gainbridge Fieldhouse, built in downtown Indianapolis in 1999, is undergoing a three-year \$360 million renovation, including a network upgrade and new restrooms.

But when renovations are completed this fall, only a small subset of the venue's restrooms will be IoT-equipped. Raines explained that through its partnership with Sloan, they decided to create a touch-free environment for the arena's CareSource Courtside Club, a premium space that accommodates about 600 people. In the club, there are five stalls in the women's room, and three urinals and two stalls in the men's room.

**"Then the discussions turns to how quickly customers can get the signal out [to the network], so Bluetooth-to-LoRa gateways are becoming very popular," Quant added.**

From there, the IoT device links can connect to IoT gateways, then to Wi-Fi and even CBRS and private LTE networks that are becoming increasingly common inside venues.

But as stadium and arena managers have discovered, building materials can be a huge challenge to wireless installations, depending on what's in use and the age of the facility.

Now more than ever, we're gathering, connecting, and sharing experiences.



## Is your venue ready?

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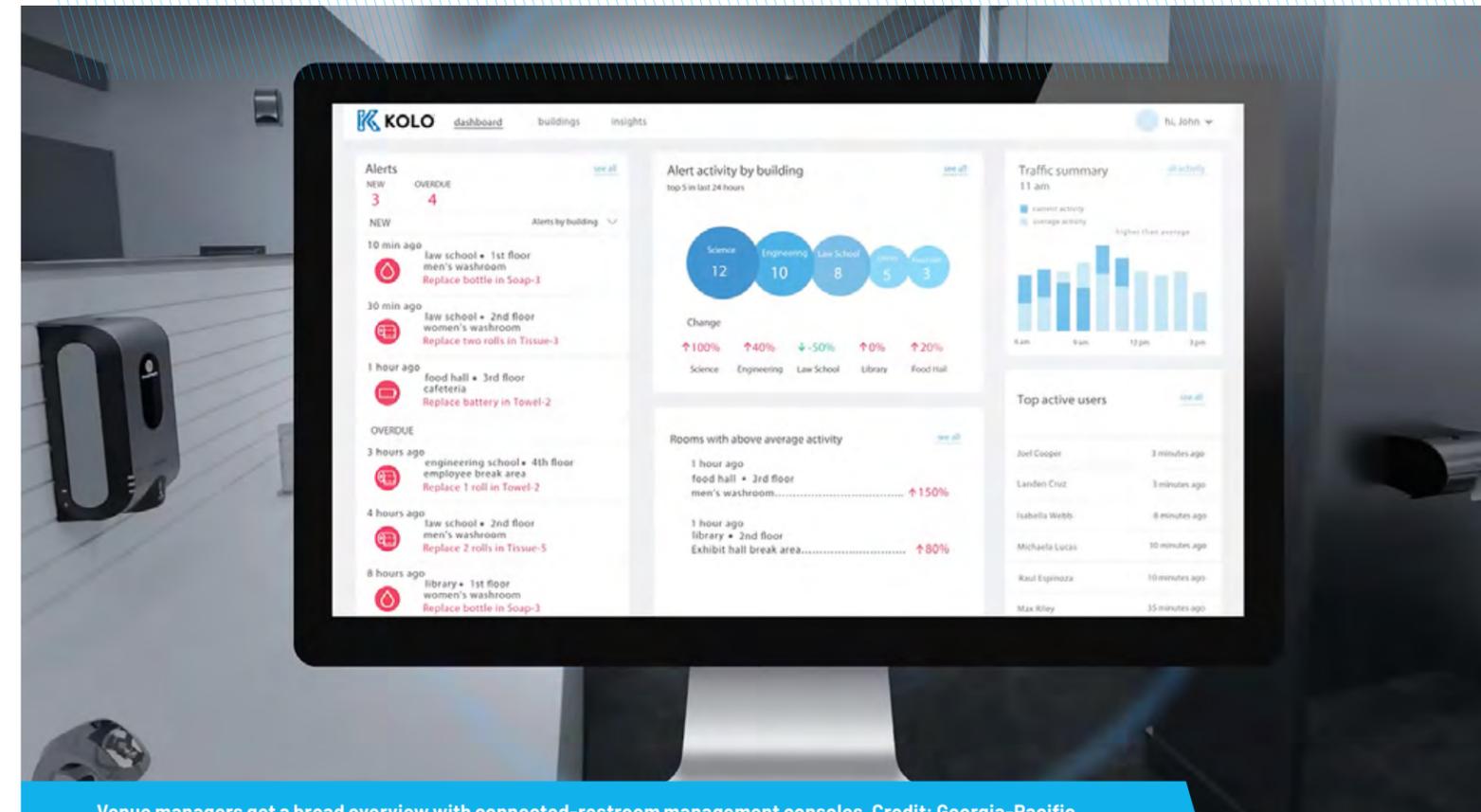
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Venue managers get a broad overview with connected-restroom management consoles. Credit: Georgia-Pacific

“We have a red-yellow-green indicator outside the restrooms, so club visitors know how full they are,” Raines said. “That’s been really great during peak times like just before tip-off or at halftime – a great service for customers,” she added. “Each entry door to the restroom also has a sensor so that the door automatically opens as someone approaches; visitors also wash and dry their hands in the same sensor-equipped sink” in keeping with touchless experience.

**“We’re also working on making the doors to the stalls touchless,” Raines said. “It’s pretty slick.”**

The door is also open to expanding the connected-restroom concept to the rest of Gainbridge Fieldhouse, but Raines and her team want to see how the initial systems perform and what the customer feedback is.

“We have a reputation for one of the cleanest, most spotless buildings there are, and we take great pride in that,” she added.

Expanding connected restrooms across the entire venue may present unforeseen challenges, Raines acknowledged. “We were lucky we were renovating because we could essentially design this into the renovations – it wasn’t a retrofit,” she said. “It’s been a great partnership with Sloan and they continue to fine-tune things. Depending on how it goes, we may deploy elsewhere.”



# CHECKOUT-FREE CONCESSIONS STANDS READY TO MULTIPLY AT STADIUMS

An Amazon 'Just Walk Out' store at T-Mobile Park. Credit: Seattle Mariners

BY PAUL KAPUSTKA

Once a curiosity deployed mainly in trial situations, the concessions technology known as “checkout free” or “just walk out” is ready for its prime-time moment in stadiums, with a host of new deployments already announced or coming soon to a venue near you. Leading suppliers of the technology are currently busy announcing new stadium stores, with more announcements expected before the start of the U.S. football season this fall. Zippin, a San Mateo, Calif.-based startup, recently announced five new checkout-free stores at the Tennessee Titans’ Nissan Stadium, bringing its announced total to 30 stadium stores, which leads the marketplace. Amazon, with a recent announcement of three new “Just Walk Out” stores coming to Texas A&M’s Kyle Field, now has 14 announced or open stadium stores.

And AiFi, another startup, announced a new store at Leicester City’s King Power Stadium, with promises of more announcements coming soon.

## GET IN, GET OUT

If you’re not familiar with checkout-free stores, these are concession stands where customers enter stores by scanning a credit card or some other pre-authorization method at entry gates and then simply take items off shelves and are charged automatically as they leave the store. Why is this technology so powerful? In the short life of networked stadium technology developments, few innovations have benefited both fans and venue businesses so quickly and so directly. For fans it’s as low impact as you can get – you enter billing information in an app, or even easier, just show up with a valid credit card. You walk in, grab something, and leave, often within seconds. Especially for fans just

looking to grab something simple, like a cold drink, it’s easy to see the appeal of the new stores. For teams, venues and other concessions operators, the technology is heaven on many levels. For starters, having everything automated means fewer employees in lower-value positions. While the format means that there are additional steps necessary to make the systems work (there is a non-significant amount of gear needed, mainly cameras), once that flow is set in place all you have to worry about is restocking. And the latest emerging trend for the checkout-free stores is even more appealing to venues: A “drink lane” type stand where fans buy only beverages in a smaller, straight-line store format. According to one of the technology providers, such “drink lanes” can turn previously unused real estate (like the space beneath stairs or escalators) into a revenue-producing spot that can add as much as \$10,000 in new business during a single event. Being smaller in

size makes the drink lanes also easier and cheaper to deploy, giving teams, schools and venues a way to test the waters on the technology without having to commit to a more-expensive renovation of larger existing concessions stands. What follows here is a recap of recent interviews and reporting on announced and imminent plans from the top three providers of the technology, and how their offerings might fit into the concessions plans of teams, schools, venues and caterers.

## ZIPPIN: DATA, DOLLARS AND DESIGN FLEXIBILITY

At the recent ALSD trade show and conference in New York, Zippin was able to show attendees one of its premier stores up close and personal – at a Zippin-powered store at Barclays Center (where conference attendees got a tour). During the tour Zippin senior vice president of business development Gary Jacobus held court, able to show people in a much more powerful way what the checkout-free experience was all about.



An entry gate at a Zippin store in Denver. Credit: Paul Kapustka, STR

“You can talk all you want about it, but when you bring people to see it, their eyes light up,” Jacobus said in a later sit-down interview at the ALSD show. “Then they talk about maybe putting in one store and we say, ‘Be careful – everyone will want to go there.’”

Stadium Tech Report knows what Jacobus is talking about. At Empower Field at Mile High in Denver, where Zippin has nine stores – its most in any stadium – the claim that checkout-free stores “eliminate lines” is somewhat misleading, because the stores’ popularity among Broncos fans often sees lines forming outside the stores, as people try to get in for the fast concessions experience.

But such success is not entirely a bad problem, and our guess is at most of its existing venue deployments (which include Golden 1 Center in Sacramento, AT&T Center in San Antonio and Barclays Center, among others) Zippin is likely going to see more expansion. And many of those stands may be like the five going in at Nissan Stadium, as smaller “drink lane” deployments designed to focus on fast delivery of beverages, mostly cans and bottles in glass-door coolers.

At ALSD, Jacobus told us about the success of two drink-lane stands at Barclays Center, where previously unused space on stadium concourses was converted into Zippin stands that can now generate as much as \$10,000 per event.

“Drink lanes are a great replacement for portable sales, where a vendor might have only one or two brands,” Jacobus said. “In one of our drink lanes you can have six coolers with every SKU. And the blank space is now revenue-generating.”

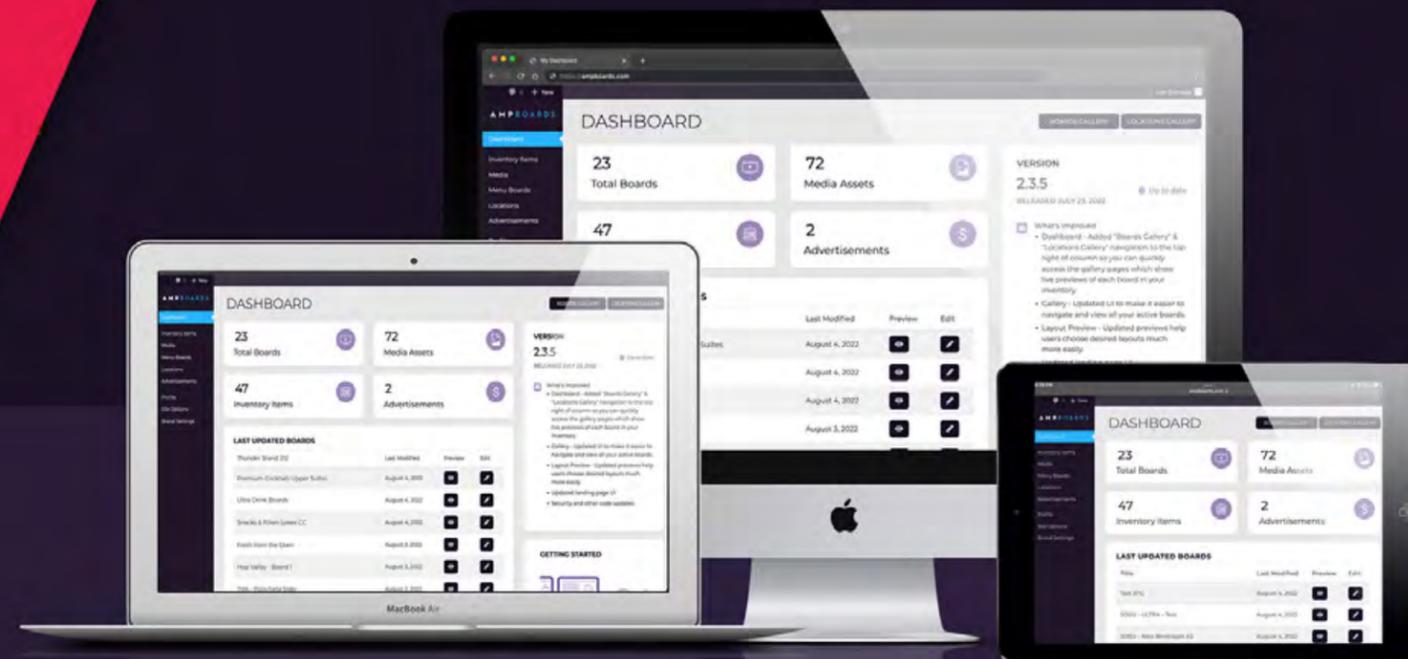
One of the facets of Zippin’s business model – its willingness to share transaction data with teams and venues – may be why the company has rapidly moved to the top of the stadium market. (Zippin, like the other competitors in the market, also has its technology in other verticals, like convenience stores and airport terminal stores.)



Getting enrollment instructions outside a Zippin store in Denver. Credit: Paul Kapustka, STR

**“We drive unbelievable data from your store to you, and we will always remain a third party [provider],” said Jacobus, whose company offers its technology as a subscription-type service. “We’re not doing our own thing.”**

So far, Zippin has been hampered a bit in telling its story since its willingness to “white label” its stores – at Barclays, for example, one store is branded as the “American Express Shop,” while another Zippin store at Petco Park in San Diego is branded by Michelob Ultra – keeps the Zippin name under wraps. Per some contracts Zippin is not allowed to use the team or



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venue name in promotion, but if the company keeps growing at its current pace perhaps at some point the secrets will become moot if Zippin becomes seen as a preferred technology supplier.

Along the way, Zippin is already learning valuable lessons from its deployments that it shares across its portfolio – like trying to install rear-loading coolers so they can be more easily replenished, usually multiple times during a game. With the rapid flow and popularity of the stands, Jacobus said, stocking a Zippin store is much, much different than a traditional stand from the past, which might be supplied once before the start of an event.

“You don’t run these like a normal stand – you want to keep the coolers fully stocked, and not looking like they’re running out,” Jacobus said.

And while Zippin stores might be more complex than other offerings – the company still uses a combination of overhead cameras and weight-sensitive shelving to provide what it says is a near-100 percent rate of correct product detection – Jacobus said the company isn’t having any problems proving its value proposition. In Denver, caterer Aramark has said that its aggressive technology deployments, of which Zippin stores are a major part, helped Empower Field at Mile High record the highest transaction rate per attendee of the 11 NFL stadiums where Aramark handles food and beverage service.

And increased sales has to mean that fans are happier,

since they’re getting more food and beverage more easily.

“We are affecting ticket sales,” Jacobus claimed. “We are part of the experience that makes fans want to come to games.”



Above: Zippin’s Gary Jacobus explains his company’s technology during a tour of the Zippin store at Barclays Center. Below right: Shelves of items inside the Zippin store. Credit: Paul Kapustka, STR

#### AMAZON: JUST WALK OUT EXPANDS IN STADIUMS, BUT MOTIVES REMAIN UNCLEAR

With 14 of its “Just Walk Out” stores now either announced or open in stadiums, it’s clear that the sales behemoth known as Amazon is moving forward in the venue concessions market. But one of the many unanswered questions about the retailer’s presence in stadiums is the big “why,” as in why is one of the world’s largest product sellers – and the owner of the Whole Foods grocery chain

– interested in the smaller and more complex world of stadium concessions?

Unfortunately, despite months of trying, Stadium Tech Report has been unable to get any answers about the details of Amazon’s interest and presence in stadiums, mainly because the company refuses to make executives available for questioning. At the ALSD show in New York Amazon was not hiding anywhere, as its mockup-store booth on the show floor had a steady stream of visitors.

But when Stadium Tech Report requested an interview with a Just Walk Out executive, Amazon first agreed to the interview, only to reverse course when we showed



The doorway at the Zippin ‘Amex’ store at Barclays Center. Credit: Paul Kapustka, STR

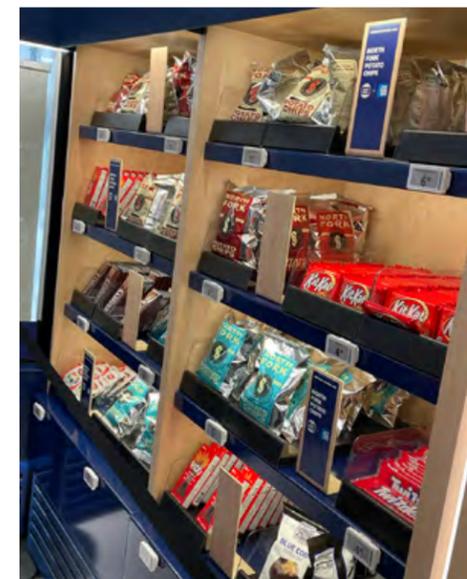
up the next day at the appointed time. The executive we were supposed to interview instead referred us to corporate PR, who responded with an email saying they would only reply “on background,” terms to which Stadium Tech Report did not agree to.

So now we are left with only some small bits of information on the technology, contract and deployment details of the Amazon stores, which resemble the Zippin stores in that both have gated entries and exits. At some (but not all) of its stadium stores, Amazon allows guests enrolled in the Amazon One platform to scan their palms for store entry.

During a tour of UBS Arena while at the ALSD show, we did get to see an Amazon store, a pop-up type enclosure on a concourse, one of two such stores in the venue. Ben Miller, senior business developer for Amazon, did answer some on-site questions about the store, which he said did not have any shelf sensors (“we use those in stores that have smaller items”). STR counted at least 38 cameras installed for customer tracking at the store.

What’s more murky are the particulars of the business arrangement between teams, venues, caterers and Amazon, a topic again off-limits to discussion by any of the parties, according to them, per Amazon’s request. At the UBS Arena store, the only one we’ve seen live, Amazon branding is front and center.

We did see one interesting component during our tech tour of UBS Arena – a completely separate fiber drop for the Amazon stores in the main telco back office room, confirmation that the stores there have network



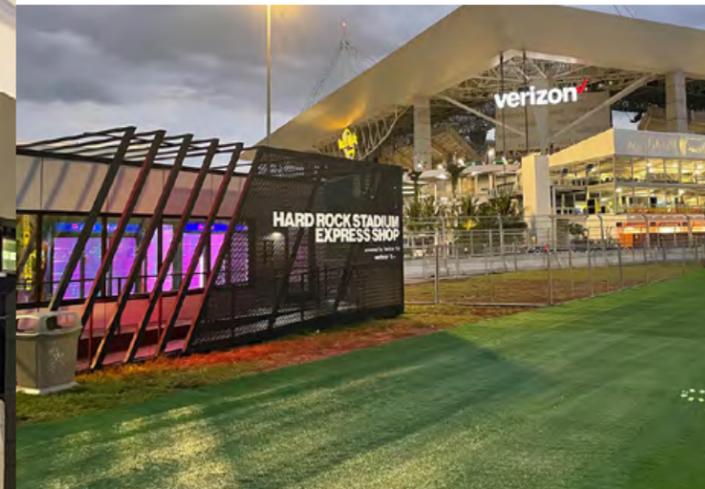
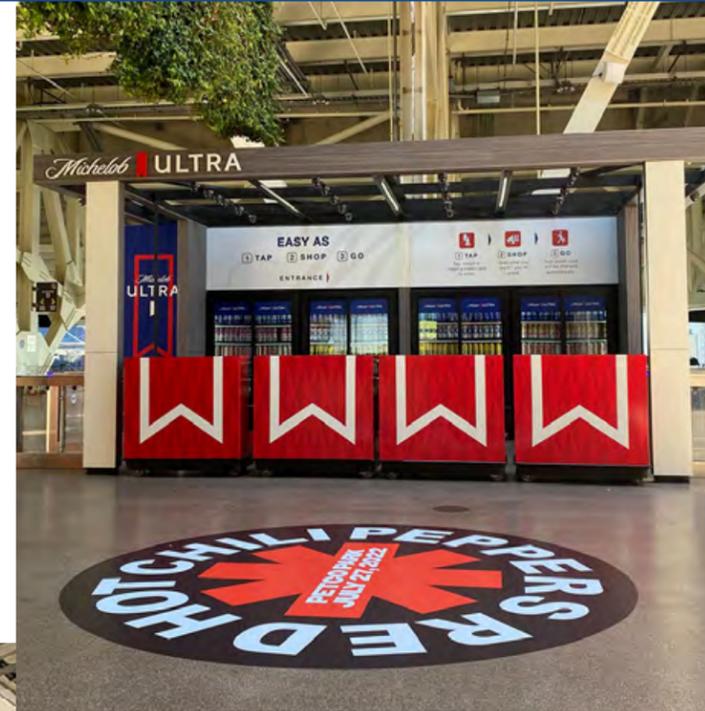
connections separate from the rest of the venue. We also were not able to get anyone from any venue to answer questions about whether or not Amazon shares transaction data for its stores with the teams and venues hosting the stands.

Amazon, which has also deployed the Just Walk Out technology in some retail grocery stores – including at a full-size Whole Foods store in Washington, D.C. – has some interesting stadium stands, including a Starbucks outlet at Climate Pledge Arena in Seattle. But what exactly the company is seeking with its stadium presence – more Prime signups, more

customer data, more AWS contracts – and what all that means for potential team and venue partners – are details still unanswered.

#### AIFI: ADDING STORES INSIDE ARENAS

The third player in the checkout-free stadium marketplace, a San Francisco startup called AiFi, is getting ready to debut its first in-stadium stores this fall, at some NFL stadiums followed by some more deployments at NBA arenas, according to the company. Though it has fewer stadium stores deployed than either Zippin or Amazon, an exact total is hard to pin



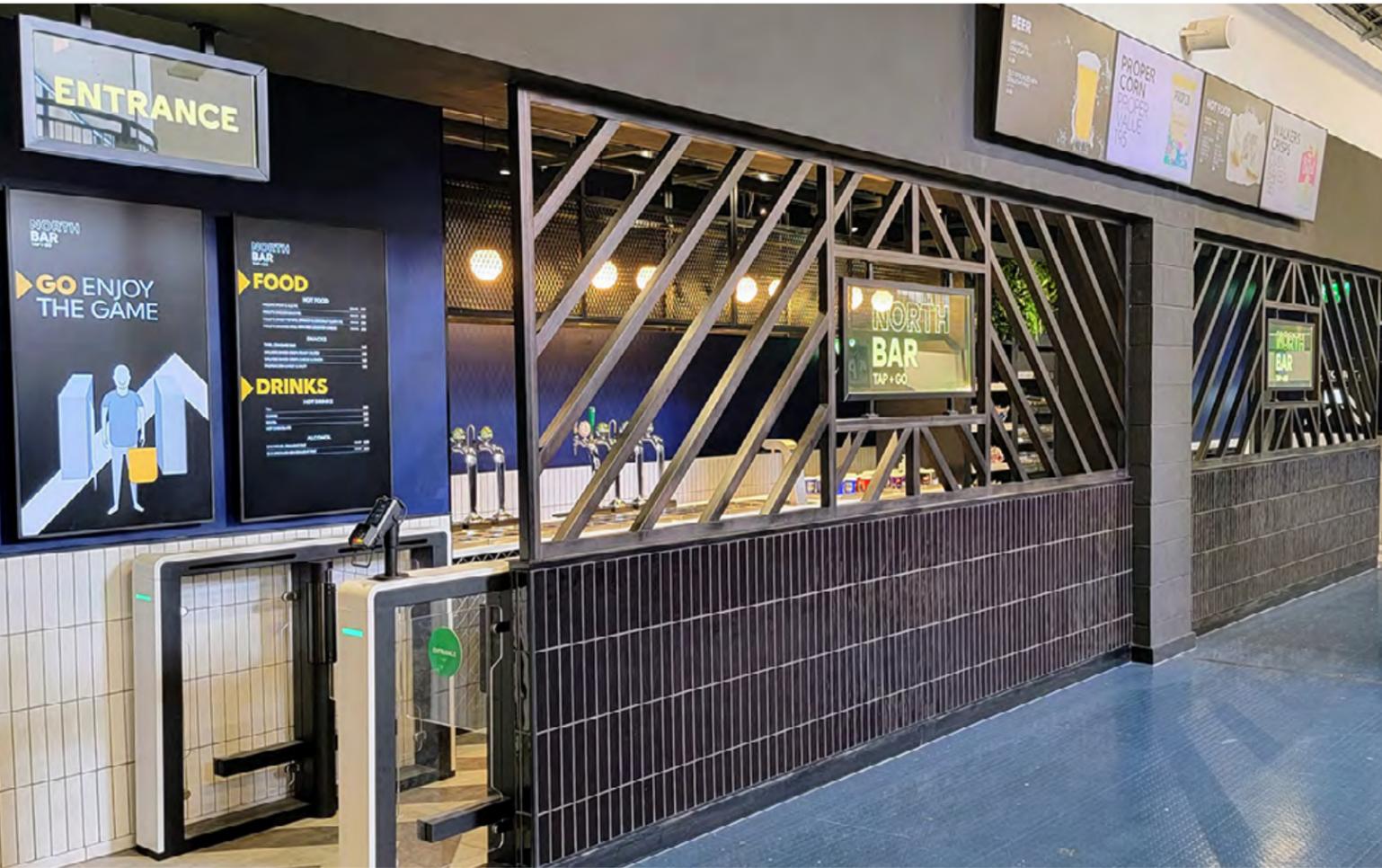
a good fit for Verizon-sponsored promotion because its camera-only technology only needs a solid connection (like Verizon 5G) on the back end.

Alex Sophocleous, head of marketing and growth verticals for AiFi, said the new stores coming this fall include a mix of nanostores as well as in-venue drink lanes and inside renovations of existing concession spaces, all new designs for AiFi. At the time of this interview, none of the pending U.S. market deals were public, so announcements will have to wait. But they are coming, according to Sophocleous.

“We’re just seeing so much demand,” he said.

Sophocleous said that AiFi’s use of only cameras for its sports stadium stores makes it a potentially cheaper and easier solution to deploy.

**“You can use existing coolers and shelving, and teams like that,” Sophocleous said.**



down for AiFi since the company has moved some of its pop-up standalone stores (which the company calls “nanostores”) to different events around the country. If you were at football games at Detroit’s Ford Field last season or at this year’s F1 races around Miami’s Hard Rock Stadium, you might have purchased items at an AiFi-powered store. While AiFi might be trailing in the market race, it did secure a \$65 million funding round earlier this year led in part by Verizon Ventures, just part of a close relationship between AiFi and the cellular giant. According to both Verizon and AiFi, AiFi’s technology was

AiFi’s first in-stadium store is a ‘drink lane’ deployment at Leicester City’s King Power Stadium. Credit: AiFi

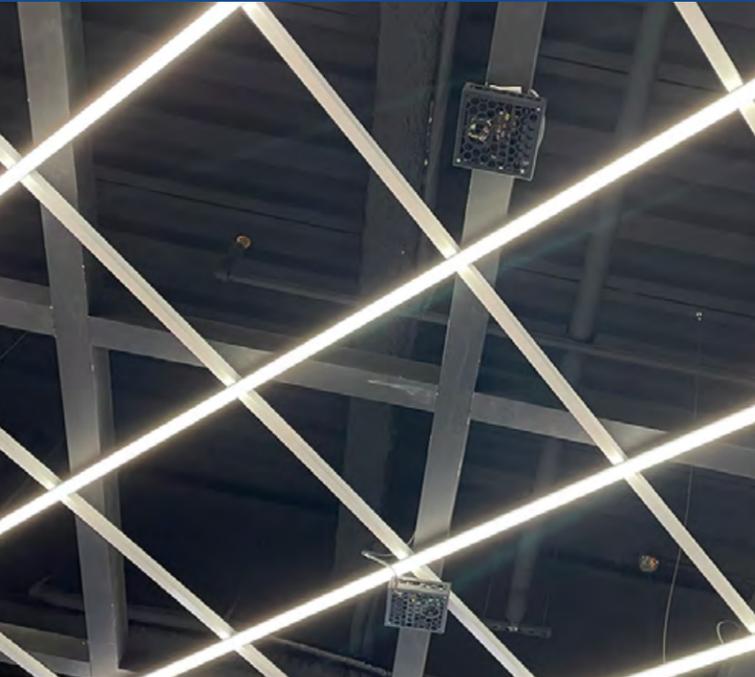
Top left: A Zippin store at Petco Park. Credit: Zippin. Bottom left: An AiFi ‘nanostore’ outside Hard Rock Stadium. Credit: AiFi. Bottom: Amazon’s ‘On the Fly’ store at UBS Arena. Credit: Paul Kapustka, STR

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While AiFi does use sensors in its deployments at convenience stores (according to Sophocleous sensors allow faster return of customer receipts), at stadiums the team has found that fans aren't really looking for a receipt the moment they leave the store.

Since teams pay for the store install for AiFi systems, Sophocleous said the stands' smaller networking demands also can make it a more attractive option. While some of its competitors require some networking hardware on site, Sophocleous said AiFi stands have only "a small media box" which can fit "behind a cooler."

Like Zippin, AiFi also provides transaction data to the teams and venues, Sophocleous said. Given Verizon's large presence in the sports stadium market – it is a partner with the NFL and has led networking deployments in many other venues, including NBA arenas – it stands to reason that thanks to its partner AiFi already has a foot in the door at many venues.

Top: Cameras at the Zippin Amex store (left) and at the Amazon UBS store (right) scan customers to track purchases. Bottom: Amazon's private fiber drop at UBS Arena. Credit all photos: Paul Kapustka, STR

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