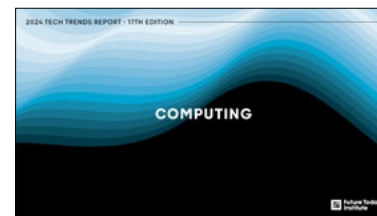
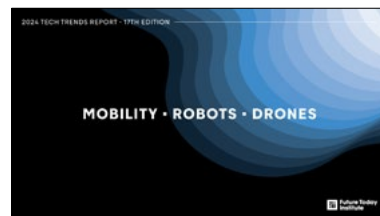


# HOSPITALITY - RESTAURANTS

# FUTURE TODAY INSTITUTE'S 2024 TECH TREND REPORT

Our 2024 edition includes nearly 700 trends, which are published individually in 16 volumes and as one comprehensive report with all trends included.

Download all sections of Future Today Institute's 2024 Tech Trends report at <http://www.futuretodayinstitute.com/trends>.





## THE YEAR AHEAD: TECH SUPERCYCLE

The theme for our 2024 report is Supercycle. In economics, a “supercycle” refers to an extended period of booming demand, elevating the prices of commodities

and assets to unprecedented heights. It stretches across years, even decades, and is driven by substantial and sustained structural changes in the economy.

We believe we have entered a technology supercycle. This wave of innovation is so potent and pervasive that it promises to reshape the very fabric of our existence, from the intricacies of global supply chains to the minutiae of daily habits, from the corridors of power in global politics to the unspoken norms that govern our social interactions.

Driving this seismic shift are the titans of technology and three of their inventions: artificial intelligence, biotechnology, and a burgeoning ecosystem of interconnected wearable devices for people, pets, and objects. As they converge, these three macro tech segments will redefine our relationship with everything, from our pharmacists to our animals, from banks to our own bodies. Future Today

Institute’s analysis shows that every technology—AR/ VR/ XR, autonomous vehicles, low Earth orbit satellites, to name a few—connects to the supercycle in some way.

The ramifications are stark and undeniable. As this tech supercycle unfurls, there will be victors and vanquished, those who seize the reins of this epochal change, and those who are swallowed whole. For business leaders, investors, and policymakers, understanding this tech supercycle is paramount.

In this 17th edition of FTI’s annual Tech Trends report, we’ve connected the supercycle to the nearly 700 trends we’ve developed. Our research is presented across 16 technology and industry-specific reports that reveal the current state of play and lists of influencers to watch, along with detailed examples and recommendations designed to help executives and their teams develop their strategic positioning. The trends span evolutionary advancements in well-established technologies to groundbreaking developments at the forefront of technological and scientific exploration. You’ll see emerging epicenters of innovation and risk, along with a preview into their transformative effects across various industries.

We’ve visually represented the tech supercycle on the report’s cover, which is an undulating image reminiscent of a storm radar. Vertical and horizontal lines mark the edges of each section’s cover. When all 16 section covers converge, the trends reveal a compounding effect as reverberating aftershocks influence every other area of technology and science, as well as all industries.

It’s the convergence that matters. In isolation, trends offer limited foresight into the future. Instead, the interplay of these trends is what reveals long-term change. For that reason, organizations must not only remain vigilant in monitoring these evolving trends but also in cultivating strategic foresight—the ability to anticipate future changes and plan for various scenarios.

Our world is changing at an unprecedented rate, and this supercycle has only just begun.

A handwritten signature in black ink that reads "Amy Webb".

**Amy Webb**

Chief Executive Officer  
Future Today Institute

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## TOP HEADLINES

**Major hotel brands are expanding globally with over 2 billion people expected to travel yearly by 2026. Restaurants are diversifying offerings by exploring autonomous vending and flexible delivery.**

### 01 **Continued Global Expansions**

Brands from Hilton to Club Med to IHG to Four Seasons are expanding to new global markets like Thailand, Mexico, South Africa, and Southern Europe.

### 02 **2 Billion Travelers by 2026**

According to research by Amadeus, there will be almost 2 billion people traveling at least once a year over the next three years.

### 03 **Business Travel Grows**

Business travel is three times higher than in 2021, signaling a return to pre-pandemic levels.

### 04 **Roark Capital Acquires Subway**

The largest restaurant acquisition in 2023, as reported, was the planned acquisition of Subway by Roark Capital, with a purchase price over \$9 billion.

### 05 **Multi-hyphenate Retail Restaurants**

Eighty-eight percent of restaurants plan to offer new products and services that differ from traditional food offerings to differentiate their business and build better client retention.

# STATE OF PLAY

Digitized hyper-personalization with contactless experiences is driving frictionless engagements and customer satisfaction.

The hospitality industry continues to struggle with labor shortages, new delivery methods and modes now expected by consumers, supply chain shortages, and increased costs. However, this has not deterred growth for major hotel brands and established quick-service restaurants, with growth for the latter projected to be just under \$20 billion in 2023. Many brands and operators are using a balanced approach when applying emerging technologies to address their challenges. While restaurants have been quicker to recover workers than hotels, both portions of the hospitality industry find themselves looking to automate and create contactless and frictionless experiences that ease staffing burdens. In 2023, the industry is exploring virtual experiences, digital concierges, and robotic staff. What was once a novelty is becoming more normalized, as many studies report that guests and customers prefer to interact less with humans and are more willing to share their data for perks. Some of the move away from human services is due to continued concerns over public safety, health, and sanitization. Increases in personalization are also helping transform expectations for this industry, so both restaurants and hotels are trying to learn as much as possible about guests and diners to anticipate their needs. In some instances, researchers are exploring how technology can turn such a capability into a mostly back-of-house process, where everything from room selection to the food delivered is pre-prepared based on what is known about a guest's preferences.

# STATE OF PLAY

Loyalty and rewards programs have renewed interest in on-site experiences, and companies are shifting toward exchanging location verification for increased access to amenities and secret menus. With customers sharing more information about themselves, the demand for secure data privacy is rising. For customers, the collection process remains highly contentious, with their decisions on whether to share data highly influenced by what information companies are willing to share about themselves. Recognition-based technology, such as mid-air haptic and facial recognition technology, has increased in both sectors, with many guests accepting it because it enables more self-service transactions. As Gen Zers continue to flex their spending power, they expect companies to provide transparency on their actions and commitment toward bettering the planet, the workforce, and general equity. The global shift toward delivery and takeout has led restaurants to revamp their spaces for efficiency, exemplified by the UK's Pret A Manger, which expanded its "Dinners by Pret" delivery service and redesigned select shops to accommodate the surge in off-premises dining demand. As we look ahead, understanding and embracing these trends will be pivotal for both restaurants and hotels striving to meet the evolving needs of travelers and diners in this transformative era.

# KEY EVENTS

MARCH 15, 2023

## China reopens to foreign tourists

As one of the last major countries to re-open its borders to foreign tourists post-pandemic, China lifts its restrictions and begins issuing travel visas.

MAY 22, 2023

## Wendy's instant pickup

Wendy's begins testing a new delivery method using robots and underground tunnels to deliver food to its parking lots.

SEPTEMBER, 2023

## Expanding focus in India and Southeast Asia

Global occupancy levels for hotels are up with revenue per available room up 17%. Occupancy rates in locations like Bali, Jakarta, and Seoul are seeing higher occupancy than 2022.

MAY 8, 2023

## Biometric access changes

Salito, known in the hospitality industry for electronic locks, acquires a UK-based company innovating in facial recognition technology.

JUNE 26, 2023

## Autonomous QSRs

Sweetgreen announces it expects all of its restaurants to be automated in the next five years.

SEPTEMBER 7, 2023

## Electrification parking

Hilton's expansion of Tesla charging stations will make it the largest provider of EV charging stations in the industry.



# LIKELY NEAR TERM DEVELOPMENTS

## POTENTIAL DISRUPTIONS CONTINUE TO LOOM

While many customers need stability to know if they should move forward with taking a trip, stability is not assured, which is normal. However, new tensions are arising that could further disrupt the market and industry. Much of these disruptions are due to customers demanding more personalization, which creates more work for businesses. That's especially difficult when these new technologies are increasingly vital to remain competitive, but the labor force lacks the skills needed to implement them. These shifts to the market also offer opportunities to increase services and provide new touch points.



### Labor Tensions

As technology adoption increases, service unions could begin to feel pressure to block developments they feel would replace their members. Examples include the outcome of the recent SAG-AFTRA strike.



### AI Avatars

Brand representatives can curate their interactions based on a consumer's preferences and response to targeted media. Booking interactions will be more friendly as a result, and dining experiences feel more personal. These nuanced relationships will transcend short-term brand mascots.



### Delivery Everywhere

Convenience will continue to win out. Delivery has returned to pre-pandemic levels, but now consumers expect to be able to get items not just at home but wherever they are at any given time. This will require new tracking methods and omnichannel delivery methods.



### Power Stability

With climate change continuing to disrupt energy infrastructure, hotels and restaurants will need to prioritize improvements to remain stable for customers. This will be a challenge as the construction industry is also dealing with a labor shortage.



### Dark Dining

As space becomes a premium, store footprints will continue to shrink, creating fewer positions for human workers and more for robots. This can increase market presence, but will require greater upfront investments and market research.



### Technology Upskilling

Current hospitality education institutions may need to add courses on technology and how to use it within the industry. QSRs will face challenges if they depend on employees lacking technological skills, necessitating upskilling cycles to train them to use new in-store technology.

## 11 MACRO SOURCES OF DISRUPTION



Technology



Media & Telecom



Demographics



Environment



Government



Public Health



Education



Geopolitics



Infrastructure



Economy



Wealth Distribution



# WHY HOSPITALITY & RESTAURANT TRENDS MATTER TO YOUR ORGANIZATION

## Tech-Enabled Personalization

Customer segmentation is time-consuming, costly, and often overwhelmingly generalizes consumers. Hotels' and restaurants' use of tech-enabled personalization and new product offerings could disrupt other markets that have yet to find ways to curate customized offerings.

## Interactive AI

Traditional marketing will slowly shift as customer loyalty becomes more attuned to interactive AI offerings by restaurant and hotel brands. It will also offer new types of cross-industry partnerships, as these AI offerings will be able to cross-promote for hotels, travel destinations, dining locations, and events.

## Nomadic Living

As many populations around the world embrace WFH, they are also becoming more mobile. This nomadic way of living will lead to lodging revenue growth for companies that can attract more mobile workers while differentiating themselves from their competitors.

## Smart Management

Adoption of smart management systems will continue to become a competitive advantage for those that make the leap first. These systems will allow hotels and restaurants to redefine customers' expectations. They will also help businesses be ready for future energy and environmental regulations that will disrupt operations.

## Pre-Experiencing

This trend will redefine the customer journey, enabling new selection criteria and opportunities for engagement. It can also provide new insights into consumer behaviors, based on what they interact with and what upselling options are available, and create new product offerings that generate revenue even before a consumer comes to the physical location.

## Verified Loyalty

New forms of loyalty programs that include verification can improve transparency and customer retention. They can also offer ways to cross-promote new offerings and test new marketing strategies, and can potentially collect more data to further amplify the personalization customers are requiring.

# OPPORTUNITIES & THREATS

## Threats

Automation could create curated guest and customer experiences, reducing the time needed to perform tasks. It would require a heavy lift of data on the front-end and permissions from customers, but this could become an attractive selling point that continues to grow as customers interact with the automation platform.

Chatbots becoming virtual avatars would allow for more friendly customer exchanges, especially as avatars become more lifelike. Companies with traditional call centers could replicate face-to-face interactions with this technology.

Virtual try-before-you-buy add-on purchases could increase upfront profit and generate new revenue streams for multi-hyphenate businesses. The same technology can support product development and trials to gauge consumer interest.

Digital means could let companies offer increased wellness offerings, both in the home and on site. Their entry into new markets would require relatively little investment compared to developing a full site location.

Transparency through verified loyalty programs can increase trust for customers and businesses. Customers would be confident that their rewards are accurate and secure, while the business gets a platform for sharing their latest transparency reports.

## Opportunities

Businesses not already addressing the lack of data consistency and the need to verify existing data and implement new data collection tools are lagging. Data will continue to become more vital and ubiquitous.

Both businesses and workers face uncertainty in the future of human talent. Companies need to understand their weaknesses in future talent and provide messaging to current and potential employees to minimize fear of future job loss.

Delivery everywhere makes it harder to manage customer expectations and increases competition as traditional restaurants could see a decrease in foot traffic. It also impacts quality control and relies heavily on third-party platforms.

Guests' expectations for medical biome testing could lead to on-site wellness facilities needing to follow new medical guidelines and procedures that increase staffing needs and change spatial allocation and design. Their liability risk could rise as a result.

Fast dining could take over slower traditional dining as consumers become increasingly time-poor. The importance of physical place could subsequently decline, meaning current investments may need to be rethought and redeveloped. Smaller urban infill locations may become a desirable strategy.

# INVESTMENTS AND ACTIONS TO CONSIDER

1

Consider investing in data collection and analysis partnerships if these tasks are not already being done in-house. You'll gain the level of granular customer insights needed for making informed decisions about the future. It will also increase efficiency by predicting staffing changes that will need to be made.

2

Upskill your talent now for a technology coworker or director, and consider looking for on-site technicians who can service new enabled equipment. Also important will be creating partnerships with or hiring companies that can implement these technologies. Evaluating them now will prepare you for investing in them when the time is right.

3

Consider transforming loyalty programs into data collection tools as one way to obtain data from your customers. This can also begin to set future payment expectations as blockchain technology scales in the future, and will be seen as a step in data security and privacy by consumers.

4

Start investigating the adoption of robotic equipment while talent shortages persist so you can leapfrog competitors that have already invested and installed their machinery. Focusing on where staffing shortages could occur—versus investing in every flashy device—will allow you to bolster your production line.

5

Since reliable delivery staff will become quintessential to the market, especially as delivery becomes ubiquitous, look for the right third party that has verified the skills of their delivery staff. For those third-party vendors, consider finding ways to partner your employees with the right food vendor.

6

Prioritize site development for dark stores and infill locations so that if there is a talent drought, your stores do not go dark in other ways. Automation can help create smaller footprints, which means new site considerations could be developed for target markets. This includes hotel brands wanting to create mini experiences to attract visitors.

# CENTRAL THEMES

## Getting Personalization Right

Guests expect experiences to be customized to their granular needs and wants. Combine this with the fact that companies in the hospitality industry, whether they are willing to admit it or not, are struggling to figure out how to increase their market share and customer loyalty and retention in unique ways. And companies putting money toward personalization are finding there are more ways than ever to achieve these goals. Personalized tastes, viewing experiences, rooms, food, and even entire menus are all on the proverbial table. Machine learning offers ways for companies to jumpstart this process, but lacks tools for either collecting the data or translating the data they have. Food and menus will be the most affected by this increase in personalization, as 3D-printed and engineered foods offer alternatives to traditional meals and flavor profiles. Potentially, multiple diners ordering the same dish from the same menu would have entirely different experiences from one another, with their food reflecting their idea of just the right amount of saltiness and spice.

## Elevated Experiences

Dining is no longer just about the sense of taste; increasingly, people are demanding experiences that cater to their other four senses, too. As luxury experiences become more in demand, many are gravitating toward more sensorial experiences to elevate their dining events. New forms of synthetic media, including avatars and digital menus, offer highly entertaining interactive experiences, and immersive rooms create a complete separation from the reality outside. These kinds of experiences enhance the food, and provide guests with a high-level expectation of their future visit to the physical space. They are being used to help combat the pickup or delivery-first mentality for restaurants, while serving as educational tools that resorts and other hotel locations that host events are using to stay competitive. Elevated wellness experiences also are providing guests one-of-a-kind experiences, especially when enhanced by technology. Boutique brands around the world are experimenting with new digital treatments meant to elevate mood and detox the body based on on-site testing.

## Labor Automation

Amid persistent labor shortages, many hospitality companies are using technology to automate their staff functions. Use of AI is happening for dynamic pricing, robotic cleaning staff, and automated concierge services. This automation, once regarded as off-putting, is now being seen as a boon to customers and guests. Resource management systems offer ways for operators to hone in on specific staff functions and determine when they should be carried out, as well as when guests will want to interact with actual humans. In the quick-service restaurant industry, automation of the back-of-house cooking functions seem to be steadily increasing with more niche robotic equipment continuing to be developed. While ghost kitchens are declining, this automation may be one way for them to move forward, especially if they use it for the delivery process as several prominent chains have done.

# CENTRAL THEMES

## Climate Impacts

Climate change continues to impact the hospitality industry. Disclosures for ESG standards are shifting decades-old practices; if companies are transparent in their sustainability actions, they could acquire new customers, but if they lag, they could be canceled. Climate change is a driver behind how spaces are being designed and how they'll function, with a changing reality requiring new energy sources and water reclamation equipment. The electrification of vehicles is also shifting needs for guest, employee, and delivery driver parking. EV adoption will increasingly be an important area to watch and consider. Lastly, food production and waste has become more important, especially with the disruption of supply chains due to extreme weather, which is introducing new practices for watching what goes on the plate and what goes in the bin.

## Less Human Contact

Hotel guests are finding more ways to avoid human contact. They are happy to walk into a venue and have a completely automated check-in process, their room controlled by technology, and engage with events and the checkout process without seeing or speaking to a human staff member. This comes as no surprise as technology becomes more pervasive in the home, work, and retail worlds. Guests expect to be able to use technology to adjust their settings and customize their stay. Restaurant goers are moving into this category as well. Ordering can be done more seamlessly at the table with QR codes, and servers are using technology to know their guests' needs and dietary restrictions. This knowledge helps to streamline the overall process, including faster customer service and turnover. Traditional dining restaurants are not following this trend as much, which could create an interesting dichotomy and reveal whether future customers prefer slower or faster service.

## Hyper-Locality

Determining where you stay or dine is becoming more localized to niche locations, reflecting a significant shift towards hyper-locality in the hospitality industry. This trend is evident from the emergence of nomadic hotels that tailor their location and offerings based on the precise desires of their guests to the meticulous precision of last-mile delivery services, ensuring meals reach consumers at their exact locations. Hyper-locality is not just about geographical accuracy; it's also about tailoring experiences and products to meet the specific cultural, dietary, and experiential preferences of local markets and individual consumers. Combined with technological advances in avatars and other interactive experiences, those local experiences could also become global marketing tools. This approach will allow restaurants and hotels to offer highly personalized experiences, fostering a deeper connection with their clientele.

# ONES TO WATCH

**Michael Bickel**, CEO at TableMation, for driving tech-driven, immersive dining.

**Steven Chen**, architect at Moliving, and **Hanna Bem**, COO at Moliving, for designing the first nomadic hotel.

**Robin Simsa**, CEO at Revo Foods, for enabling 3D-printed salmon at scale.

**Dr. Cindy Heo**, associate professor at EHL Hospitality Business School, for their paper on the novel use of machine learning for dynamic pricing.

**Dr. Luciano Viverit**, doctor of philosophy at INFN Milan, and **Luis Nobre Pereira**, vice president of Research Centre at University of Algarve, for their paper on the novel use of machine learning for dynamic pricing.

**Dr. Vikas Sadvilkar**, CEO at AirOWater, for enabling the development of clean water from humidity in the air.

**Graeme McLean**, professor of marketing at the University of Strathclyde-Glasgow, and **Dr. Jennifer Brannon Barhorst**, associate professor of marketing at the College of Charleston, for their paper on the role of virtual reality in hotel booking.

**Grzegorz Sochacki**, Ph.D. student at the University of Cambridge's Department of Engineering, for his work on a robot chef that learns to taste food.

**Rajat Suri**, former CEO at Presto AI, for software and system development efforts leading to AI-enabled drive-thrus.

**Gareth Hughes**, founder and CEO at Crave Interactive, for developing interactive tablets that allow guests to utilize AI in hotel rooms.

**Ben Kaplan**, owner of PLNT Burger, and **Ken Sutton**, CEO of Yobe, for their work on voice-ordering at kiosks.

**Shagufa Ali** and **Anupama Singh**, assistant professors at Graphic Era Hill University, for their patent on a method of reviewing and selecting hotels based on real-time hotel rankings.

**Chris Silcock**, chief commercial officer at Hilton, for working on prebooking experiences.

**Ajay Pratap Singh and team**, for their patent for IoT-based predictive hotel arrival.

**Chris Somogyi, Dr. Soojin Jun** and **Paul Levins**, co-founders at EverCase, for their work in the novel use of electric and magnetic fields for food storage.

**Logan Kim**, CEO at Nuvilab, for using AI to analyze food nutrition and waste.

**Marc Handels**, chief technology and innovation officer at SALTO Systems, for the company's work on facial recognition technology for the hospitality industry.

# IMPORTANT TERMS

**Back-of-house (BOH)**

The area in a hospitality establishment for food preparation, storage, and staff administration, generally away from customers.

**Biometric payments**

Technology that uses biometric data like facial recognition, gestures, voice, or fingerprints for identification to complete a transaction.

**Dark dining**

A restaurant location that is completely autonomous and not meant for dining in.

**Digital loyalty programs**

Membership or rewards programs that use digital technology like blockchain to track customer interactions and provide membership benefits.

**Environmental, social, and corporate governance (ESG)**

The framework and disclosure around how a company addresses these issues.

**Extended reality (XR)**

A technology that can augment the physical world through either virtual or augmented reality.

**Facial recognition technology**

Technology used to authenticate customers by analyzing their facial features.

**Frictionless experiences**

Experiences that minimize physical contact, layout obstacles, and seamless interactions for guests and customers.

**Front-of-house (FOH)**

The area in a hospitality establishment where interactions between guests and staff occur.

**Kiosks**

Self-service terminals of any kind, typically used for ordering or obtaining information.

**Mid-Air haptics**

Technology that can track movement and enable the sense of touch without touching a physical object.

**Modularly built**

A construction technique that uses prefabricated components to create a space, building, or other structure.

**Natural language processing (NLP)**

AI that can understand the human language and respond in a human-like manner.

**Quick-service restaurants (QSR)**

Restaurants that prioritize fast and convenient service over longer-stay dine-in experiences.

**Revenue per available room (RevPAR)**

A key performance metric of the hospitality industry that divides the total room revenue by the number of available rooms and assesses a property's performance.

**Smart management**

The use of technology to automate certain parts of the operational management of a restaurant or hotel.



# ENHANCED HOSPITALITY EXPERIENCES

## 1ST YEAR ON THE LIST

## INTERACTIVE AI

## WHAT IT IS

**AI is being used as an end-to-end assistant, as well as a synthetic persona to engage with guests. Traditionally relegated to the back end of the experience, this is happening from start to finish.**

## HOW IT WORKS

AI is becoming more interactive, with many hospitality companies using AI personalities, avatars, or interfaces to interact with guests. While these AI interactions started with chatbots responding to online inquiries, complaints, or reviews, they now occur during booking, while on the hotel's premises, or post-stay. Tools like Akia use NLP to speak to guests in their native language and answer questions, while Quicktext integrates into messaging platforms to interact with potential guests. In April, Breezeway announced the launch of its Assist AI, which helps short-term stay rentals automate responses to potential guests about property information like parking, Wi-Fi logins, and other general information.

A recent patent shows how AI is now moving to the front-end experience for guests as well, through travel agencies that are looking to manage booking blocks of hotel rooms. Crave AI, from Crave Interactive in London, works as a digital interactive display window. Guests use it for learning about and booking rooms and spa treatments, and receive voice, video, and image replies to their queries. At the Cosmopolitan in Las Vegas, the AI bot Rose touts that she can “hook you up” with the best the town has to offer. Rose’s informal discussions about her favorite things make it seem like is a Sin City resident.

## WHY IT MATTERS

Most guests are starting to prefer less contact with human staff. For companies considering using AI, consistency will be key in implementing this technology, as well as an increased social awareness for how adoption affects public perception. Integrating AI that uses NLP will lead to better customer experiences while reducing time needed to reply to guests. These AI interactions will also provide new data, including detailed segmentation information that a company can use to update guest profiles, map customer journeys, and train staff. It will be important to keep online and onsite experiences consistent, so guests feel that they get to know the AI. New forms of entertainment and recognition will open up to increase loyalty and engagement. Traditional rewards programs can be cumbersome, as with many other processes, but this and other tasks could become how AI manages mundane customer interactions. If used correctly, the technology could also help improve training by modeling the best interactions as rated by guests.

## 1ST YEAR ON THE LIST

## SMART ROOMS

## WHAT IT IS

**In-room technology now allows for voice-controlled interactions, new VR activities, sleep sensing beds, and more. IoT sensors, control panels, and voice-activated automation are helping to create unique guest experiences.**

## HOW IT WORKS

Voice assistants for smart hotel rooms are becoming guests' preferred technology advancement, and almost half of them report this technology factors into their decision about where to stay, according to a Hotel Technology News survey. Over half of hotel operators already offer or plan to add voice-controlled technology in their guest rooms. Control through tablets has also become an expectation. Hotels like CitizenM and Four Seasons currently offer in-room tablets that control the blinds, adjust the temperature and lighting, and allow for food ordering and information searching.

Increasingly, hotels are integrating smart sensors into guest rooms for more personalized control, safety, and efficiency. These sensors can be integrated into the HVAC system and occupancy sensors to track the areas being used and adjust building systems accordingly. In Lake Nona, Florida, the Wave Hotel will use Well+tech by Wave for air sanitization and circadian lighting to boost a guest's circadian rhythm. Well+tech is also using AI-enhanced beds to help guests get a better night's sleep. Sensors by pools and bath tubs are being explored in a patent for safety in monitoring water levels and temperature when a person is present.

VR is also making hotel rooms smarter with projection interfaces for guests to interact with and change how the room looks. Marriott's customers can order VR headsets to their room and then have customized virtual experiences. One experience is a VR Postcard, which lets them experience stories from travelers around the world.

## WHY IT MATTERS

Guests are beginning to expect smart and enabling technology in the room, and will increasingly feel neglected and frustrated by older technology. As properties look to compete and differentiate themselves, smart rooms offer more engaging stays and experiences while feeding companies new data streams for how their future properties should operate. As the data becomes increasingly important to guests, so should considerations around transparency for how it will be used. Smart rooms can also be curated based on a value of the brand or a location, meaning the smart room could interact with its own style if it were in Mexico versus Italy. While the implementation of this technology can be a costly investment, a return will be realized as guests increasingly rely on it for elevating their stay. Hotels can also craft a safety campaign around these improvements, as they offer more curated control over the systems and tools used to clean rooms. However, cumbersome interactions will need to be smoothed out prior to launch, or the technology will be seen as a burden rather than an exciting offering. This is especially pressing for technologies that will be augmenting traditional human-staffed roles.

## 1ST YEAR ON THE LIST

# DIGITAL WELLNESS TREATMENTS

## WHAT IT IS

**Virtual wellness experiences, detox technology, and exercise technology are being integrated into traditional spa and wellness centers.**

## HOW IT WORKS

Physical wellness has been a mainstay of offerings from the hotel industry, and Peloton and other interactive technology exercise equipment have already become integrated into these offerings. Physical and mental wellness experiences are also now becoming more technologically enabled. Sensei Lānaʻi, A Four Seasons Resort in Hawaii, is offering wearables and an analysis of a guest's biometric data to optimize health awareness and offerings.

Detox technology is also enabling better physical health, with Montage Laguna Beach offering VR immersive experiences and detox face and feet technology, and the spa at Claridge's offering the UK's only MLX i3Dome, a three-in-one body-detoxifying chamber. Mental health offerings enabled by technology are continuing to grow, too. Well+tech guests will have access to virtual reality-led meditation with LUVRworldwide, and the Carillon Miami Wellness Resort has what it calls the biostation, which is an anti-aging and medical wellness center. One offering at the biostation is a meditation pod that uses color, sound, and energies therapy. Akasha Spa at Café Royal has launched London's first Electronic Music Meditation class, and Kimpton Hotels has partnered with Talkspace to provide free online therapy sessions for guests.

## WHY IT MATTERS

Wellness continues to be an important motivation for travel and a major factor in guests' hotel selection criteria. With many still looking to spend down unused monies from the pandemic and prioritize their health and well-being, offering unique digital wellness experiences will garner international attention and guests. Aligning with these preferences ahead of investments will be key to their success, as well as make them more affordable. Digital wellness also offers non-traditional engagement with guests and can be done to scale in multiple sites, meaning smaller sites could still offer high-end digital wellness treatments that take up smaller footprints. More integration of wearables and data will also impact wellness treatments and help companies curate them to meet individual needs. This will require policies and adherence to health information privacy and individual customer expectations. A particular challenge arises—capturing the data during the short amount of time when guests are on the property—so hospitality companies will need to factor in the ability to process data quickly.

## 1ST YEAR ON THE LIST

# SMART RESOURCE MANAGEMENT

## WHAT IT IS

**The hospitality industry is responding to the call for better use practices by investing in smart resource management platforms, devices, and systems.**

## HOW IT WORKS

Water is a top-of-mind resource for most hotels, but especially in areas where it's scarce like the Middle East. In Dubai, Delta Hotels by Marriott are employing new technology to address water scarcity in the region. The hotels use India-based AirWater's Atmospheric Water Generators to turn the humidity into clean, drinkable water. In fact, they have two of these machines to provide water to all its guest rooms, restaurants, meeting facilities, spa, and gym. For pools, WaterGuru's SENSE is an AI that can self-manage multiple pools for better water management and testing. And for HVAC, the Beverly Hilton and Waldorf Astoria Beverly Hills are using an ice-based thermal energy storage system called Nostromo Energy to provide carbon-free air conditioning. Singapore-based proptech startup SensorFlow offers IoT and AI integration into a hotel's energy management system to help automate energy consumption. Hotel Marcel in New Haven, Connecticut, has become the first net-zero hotel in the US by relying on a variable-capacity heating and cooling HVAC system and Mitsubishi's first installation of its Heat2O all-electric high-volume hot water system.

## WHY IT MATTERS

Many guests are sensitive to the needs of the region they are visiting. They are well aware when there is a drought, and those who are eco-conscious will expect the places they stay to not tax a region's fragile resources. In many regions, government entities are banning pools due to climate change. This, along with strains on existing power grids, will force the hospitality industry to become more responsible with its resources, and will necessitate hotels go beyond simply asking guests to reuse their sheets and towels. With many guests using sustainability to guide their travel destinations, hotels could become rated based on their carbon footprint and sustainability strategies or implementations. This type of information is readily available in other markets—like grocery and dining, thanks to apps that give you information on how much your food is adding to your carbon footprint—but this type of information seems less marketed and offered in the hotel industry. For early adopters, it could be an effective marketing strategy and a differentiator.

## 1ST YEAR ON THE LIST

# NOMADIC AND MODULAR HOTELS

## WHAT IT IS

**While a nascent trend, some new hotels are creating mobile properties that ebb, flow, and move due to guest demand. Nomadic and modular hotels can be quickly constructed, taken down, and relocated.**

## HOW IT WORKS

The hotel industry is responding to the market's increased desire for mobility with its own version of a pop-up: movable hotels. Moliving is building a modular and movable hotel in New York that can scale up depending on needed inventory per season. The structure costs \$150,000; it takes about five months to manufacture and can be removed without harming the land it sits on. Habitare is creating a movable luxury hotel that is meant to travel to locations that might have been previously inaccessible. Its model creates instant destinations, based on demand, that are quick and affordably constructed.

For more permanent, but still modularly built hotels, we can look to Volumetric Building Cos.: It's working with Fairfield by Marriott to use modular construction to rapidly expand Fairfield's existing properties worldwide with a new prototype. Uni Villas offers modular units to create mini resorts for entrepreneurs. These units are prefabricated and shipped on the back of a truck with furniture and check-in systems included. London's Aylott + Van Tromp offers Hytte: 15 pre-designed cabins for hotel operators to use. The cabins can either be off-the-shelf or customized and can be used for local stays or more remote destinations. Both Uni Villas and Aylott + Van Tromp say these types of creations are essential to enable the hospitality industry to respond to demands for new locations, while being sustainably minded.

## WHY IT MATTERS

With a more mobile population looking for curated places to live and work, and the blending of working spaces into the hospitality sector, nomadic and modular hotels could offer more temporary ways to capture those guest stays. This could give the hospitality industry the potential to disrupt apartment and co-living spaces, as well as co-working locations with more nomadic and pop-up locations. While the mobility infrastructure could prove challenging, it could also allow development costs to go much further, allowing companies to set up a bare-minimum site versus a fully new-build location. As urban centers try to find ways to revitalize and reinvent themselves, these modular and nomadic locations could bring new opportunities for tourism and experiences, which means there could be new and specialized location offerings. This, paired with other entertainment offerings like concerts or events that are typically hard to reach or attend due to lack of hotel space, could also increase their relevance to the industry. Studying when market saturations peak will be critical to know where to invest here.

# SCENARIOS

## SCENARIO YEAR 2033

### **Nomad Stays**

While traditional hotels are holding strong, there has been some strong competition from an unusual source: RV parks. Once thought of as a destination for campers and mobile families, with the addition of off-grid infrastructure and modular hotels, RV parks have become all the rage for pop-up hotels. Initially, there was an increase in RV parks in Norway, as tourism to its luscious fjords rose. Acting quickly, Marriott spun off a new division called Nomad Stays, which offers predictive insights into when and where pop-up hotels should be built and then taken down and moved to a new location. The Vinjerock and Træna music festivals were the first trial runs in 2028—while they had moderate success, what was especially newsworthy was that the modular cabins were set up for the Træna festival first, taken down, shipped, and set up for the Vinjerock within a week's time. Attendees reported that they much preferred to sleep in one of the modular sleeper bunks that had its own facilities over using a tent. Once news of this got out, Burning Man organizers and participants soon began to contact Nomad Stays to see if they could purchase or rent these cabins, especially when the weather called for rain. Pretty soon, Nomad Stays had set up roving sites around the Isle of Arran in Scotland, Ladakh in India, and even Mount Cook National Park in New Zealand. Nomad Stays' current top demographic? Autonomous vehicle owners. With more autonomous vehicles and people working from home, many have their cars book their Nomad Stay for them, and just let the road lead them to their next destination.

## 1ST YEAR ON THE LIST

# FRICITIONLESS STAYS

## WHAT IT IS

**Beyond contactless checking in and out, new technology for payments and authentication are minimizing staff-guest interactions and providing guests with greater access to the facilities and activities on site.**

## HOW IT WORKS

Interactive digital concierges and XR technology are now facilitating a hotel guest's entrance experience. Uniguest offers an all-in-one digital concierge signage system for finding information on restaurants, events, and other information. The goal of the system is to reduce the need for guests' interactions with human staff, thereby freeing up humans to perform other work. At Yotel's Singapore location, digital check-in kiosks similar to the ones used at airports provide guests a frictionless and humanless check-in process. The hotel has also been using robots to help with its service offerings since 2019.

Voice assistants are providing support, as guests can use them to request towels, check in or out, and make reservations without having to call the front desk. A recent patent is exploring using sensors embedded throughout the hotel to predict when guests will arrive, based on their uploaded profile and past activities, so staff can address the needs of the hotel room while guests are away. Some are using wireless sensing technologies to automatically identify and authenticate guests throughout the site, which helps enable seamless transactions. Similarly, contactless payments are no longer reserved for large resorts. Two hotels in Ibiza are using Very Important Bands (VIBs) to allow guests to skip lines, pay, check in and check out. Even elevators are becoming more frictionless with the NZ Technologies HoverTap system, which allows for panel control by a touch-free hand gesture.

## WHY IT MATTERS

Guests' desire to have fewer interactions with human staff has extended from the check-in desk to wanting to walk in and out without needing to speak to anyone at all. For the worn-out business traveler, a more frictionless stay could be especially nice. This could also be of benefit for anyone in the travel industry working off-hours or arriving early in the morning or late at night, worrying if the night manager will be available and responsive. With new management systems, guests will now select the number and type of interactions they do want to have with humans—and choose where and when. New booking practices will need to include this option for guests to select, and hotel staff might also need to ask that question upon arrival. On-site technology repairmen will also become more of a necessity due to the increased integration of humanless technology, in order for the experience to stay smooth. These technicians might also need to be more than repairmen if the frictionless stay includes digital wellness treatments or in-room cooking and dining.



## 1ST YEAR ON THE LIST

# HYPER- PERSONALIZATION

## WHAT IT IS

**On-premise staff, rooms, and spaces are utilizing technology to know guests' preferences on a granular level; this includes predicting what guests might want before they even know themselves.**

## HOW IT WORKS

Data to enable personalization is becoming more of necessity to increase profit and generate guest loyalty. While a report from Sojern found that over three quarters of hotels have seen an increase in revenue after enabling first-party data acquisition, privacy of the data remains a concern. PassiveBolt offers a solution: a single travel profile that can be used across multiple sites, services, and operators to know more about their guests' preferences. Since it's a decentralized data storage platform, guests can turn off access to their data at any time.

Predicting guest needs is also an increasingly needed skill. A recent patent looks to use AI to predict when guests will arrive while also integrating data that guests provide to choose the type of room they would prefer and make other optimizations for their stay. Facial recognition is another technology enabling greater personalization. Using Google Glass, Itesso's staff can instantly recognize guests and know how to personalize their interactions. Similarly, Hapi Guest uses its platform to give front desk agents more information about guests while they check in.

## WHY IT MATTERS

Hyper-personalization is not new, but with new developments in technology it will scale to provide personalization on a microscopic level. Guests' expectation of hyper-personalization will continue to grow as they experience what it's like to stay in a place that knows them perhaps even better than they know themselves: Their data is used to make sure food shows up before they ask, and they are offered a wellness treatment due to their stress level. Consider this the next level of stars and ratings. Hyper-personalization could become a differentiating factor in how guests search for hotels, inquiring about the levels of personalization that are offered, which would need to be standardized by the industry as a whole. It will also impact when staff are working based on a guest's preferences. Loyal and frequent guests will come to expect certain staff to be present when they arrive or be ready to offer a desired service. This could impact scheduling for staff who are experts on preparing a specific food dish or administering a wellness treatment. Technologically enabled regional personalization could become a draw for tourists who are looking for consistent but more worldly places to experience.

## 1ST YEAR ON THE LIST

# PRE-EXPERIENCING THROUGH VIRTUAL TOURISM

## WHAT IT IS

**Travel is no longer just about going to a physical destination. Increasingly, customers are using virtual vacations and tourism in lieu of IRL traveling. Hotels are using virtual reality tours to entice guests to stay at their facilities, and this concept now extends to pre-experiencing events and other on-premise happenings for further enticement.**

## HOW IT WORKS

Recent research shows that guests rely less and less on reviews, and VR plays a major role in influencing their expectations before they travel. This trend is growing with examples such as Radisson's 3D virtual venue for guests to explore the hotel and even book their room, Atlantis Dubai's Virtual Tour that lets guests see the quality level of the experience they will have at the resort, and The Grand Oasis Hotel's 360o Hotel VR Tour. Omni Hotels has found that these types of virtual tours can increase booking conversions from 16% to 67%.

Staff is also becoming integrated into this trend, like at Le Franschhoek Hotel & Spa, where a 360 VR tour offers potential guests the ability to meet the manager. With increasing virtual events, these experiences are also being hosted in the metaverse. RendezVerse is working with Marriott and Atlantis to replicate their hotels in the metaverse for virtual conferences. This type of virtual tourism is also being explored by Wander, which is creating VR travel options for exploring ancient wonders, traveling by train, or touring museums.

A recent patent also explores linking the real world with the virtual by using VR, cloud real-time monitoring, and robotics to give skiers the experience of a ski resort's live conditions in the metaverse. This could enable other services like those of UrVenue, which creates 3D maps of pools, event venues, nightclubs, lounges, and more for guests to try before booking.

## WHY IT MATTERS

Try-before-you-buy has become an expectation in retail, and the trend has now expanded to drive guests and tourists to a location. Guests will want to try their room first—to see the view or feel the bed firmness—and might also want to be walked through what their whole stay will look and feel like, which could be a paid add-on package. This capability, bundled with other personalized services and offerings, can create new travel and tourism packages and support events and conferences. Locations offering this service can pay a small fee to allow registrants to vote on which location they prefer based on the pre-experiencing offer. Pre-experience sales will help increase booking conversions, an incredibly important development when planning future conventions. It will also allow for customer feedback that can help operators know their areas of deficiency. Companies that manage booking sites and get paid by the rooms booked for these conferences should be capitalizing on this now if they are not already.

## 1ST YEAR ON THE LIST

# BUSINESS AUTOMATION

## WHAT IT IS

**From addressing staffing challenges to increasing sales to providing new means of safety, new technology is augmenting hospitality business practices and efficiencies.**

## HOW IT WORKS

Automation is essential for creating better business flow. New platforms from Best Western are allowing guests to tip staff through eTip, reducing some financial processes. PricingServiceAI is automating pricing for rooms, using market data to update every few hours. In the back-of-house, facial recognition technology is making it easier for staff to clock in and out as well: FaceMe installed at staff entrances can check employees in and also check body temperature, which can be helpful during future health crises. Staff automation can also be seen through a patent for a housekeeping system that will use AI sensors in a room to know what needs to be cleaned and directs a robotic cleaning staff to complete the necessary tasks.

Other forms of augmentation are occurring through blockchain technology like LockChain, a decentralized subscription-based platform to help make property rentals more secure. According to the 2023 Lodging Technology Study by Hospitality Technology, 70% of respondents were looking to add, upgrade, or change property management systems. New investments into management platforms like Germany-based Betterspace are providing better staff optimization and customer communication, and will be used to help enhance their energy management platforms.

Technology is also now making pools safer. Coral Smart Pool is providing MYLO, a virtual lifeguard for hotels. Leonardo Hotels are implementing this system to detect if there is a drowning incident or dangerous situation, which triggers an alarm in the pool and the hotel lobby.

## WHY IT MATTERS

With tourism increasing and labor decreasing, finding new ways to run the business—while also providing better experiences and collecting data—will continue to be of vital importance in the hospitality industry. New systems that optimize when staff needs to be present, and provide seamless payments for those staff members, will make working at those locations more desirable. These automated systems can also improve data integrity and veracity, meaning that the data collected can be trusted for informing future decisions. These reports will provide critical analytics that businesses will need for knowing where performance and satisfaction are lacking or exceeding expectations. They can also support targeted marketing campaigns based on the data collected through the automation processes that correlate to new promotions during offseasons or for repeat guests. Besides all this, automation can also help with dynamic pricing and real-time updates that can lead to maximum revenue generation. Prioritizing the right automated system and where it should be implemented first deserves to be a carefully considered decision within a long-term strategic plan.

# SCENARIOS

## SCENARIO YEAR 2028

### **The Mobile Passport Concierge**

The Juan family eagerly opens their latest purchase, a sleek-looking glass screen slightly larger than a tablet greets them in their preferred language. It's their new Mobile Passport Concierge, or MPC. "Welcome to a new traveling experience, Juan family," it purrs.

The glass projects an amalgamation of the family members' faces and continues to speak. "Please place your fingers on the screen or speak your names so we can verify your identity." After each member uses their preferred biometric to confirm their identity, MPC smiles. "Thank you. Now, as I have been given access to your shared calendars, I see that the big family vacation is coming up, but nothing has been planned yet. Is that correct?"

The Juans all nod.

"Fantastic, that is exactly what I hoped to hear because that's what I do best. I will plan it all in 15 seconds or less! Based on the data you provided when you signed up for Hilton's Curated HotelKey service, I am going to find a Hilton location that offers an immersive experience for Carlos, a 3D bio-scan for Lyla, a room that offers light and sound sensitivity screens for Miguel, and a restaurant that monitors food waste for Rosa. Here we go!" The MPC projects images showing a virtual worldwide search until it lands in Madrid. MPC chimes, "This is one of the newest nomadic destinations in Madrid and meets all of your specialized requirements and desires. It was built in under three months and travels to a new spot around the city every few years."

Very excited, the family books the trip, until MPC comes back with an alert. "I notice that Carlos' passport will expire during your vacation. Shall I update it now?" Carlos gives his consent, to which MPC replies, "Very well. Please also remember to take me with you throughout the airport as I will manage your tickets, any further passport updates, and fill out your travel visas. For now, please sit back and enjoy a quick video of the potential memories you could create."

With that, the screen is divided into four panels, and each family member watches a curated movie of themselves on their future vacation.

# AUGMENTED RESTAURANTS AND DINING

## 1ST YEAR ON THE LIST

# CONTACTLESS PAYMENTS

## WHAT IT IS

**Restaurant patrons can now pay for their meals with new forms of integrated payment. This is being offered through biometric and other forms of contactless payments.**

## HOW IT WORKS

Persistent concerns with surface sanitization have changed the way customers want to pay for their food. Most restaurant and QSR patrons prefer to use contactless payments and self-service kiosks—and businesses do, too, because it frees up servers to spend more time helping patrons versus cashing out tables. Presto was one of the first companies to release a tabletop ordering system and handheld tablet for servers, which increased the adoption of this trend. It has since evolved to allow customers to order and pay for their meal at the table with near-field communication (NFC) contactless cards and digital wallets.

Many restaurants and QSR chains are exploring using contactless forms of payment, such as biometric payments that include gesture, pay-by-face, or pay-by-palm. Panera is rolling out pay-by-palm capabilities for reward members to 2,100 locations. Steak-n-Shake is allowing 500 of its locations to use pay-by-face, and plans to expand this technology to another 300 stores. In one instance, at Pho Banh Mi Che Cali restaurants in Los Angeles, customers can opt for either paying by face or by palm. Some restaurants are also experimenting with bitcoin payments, sometimes through QR codes at the table. This builds off of systems like the Sunday app that launched during the pandemic. QR codes are now being discreetly placed on the table to offer promotions or take patrons to secret menus as well.

## WHY IT MATTERS

Even though many restaurants are actually reducing their payment options, consumers are starting to push for more. Some are asking for biometric payment options for convenience, and to make their experience quicker and frictionless. So, there could be a rise in expectation for gesture and mid-air haptics technology at kiosks and checkout counters. This all comes at a time when credit cards are beginning to cost restaurants more in transaction fees and customers are taking note when the fees are passed on to them. The new forms of payment could create less friction and quicker processing. Covert menus and easier payment options will become more appealing to patrons who are looking for new experiences with little time to spare. As kiosks become more popular within QSRs for faster customer experiences, this reduces front-end personnel needs—for some. Being aware of your demographics and allowing for those who choose to still have face-to-face interactions will be key to not exclude one consumer group over the other. Companies should begin to establish preferences for various forms of biometric payments now to help familiarize their current and future customers with this new way of paying today.

## 1ST YEAR ON THE LIST

# AUTONOMOUS RESTAURANTS

## WHAT IT IS

**Some kitchen, waitstaff, and ordering activities can now all happen with very little human intervention. This includes product ordering and prep work.**

## HOW IT WORKS

Automated drive-thru ordering is beginning to become mainstream with companies like Wendy's, McDonald's, and White Castle rolling out AI to take over the ordering process. ConverseNow offers solutions for others looking to automate with two AI personas, George and Becky, which can have human-like conversations. Drive-thrus are also becoming smaller and more automated with conveyor belts, such as at a new McDonald's prototype in Fort Worth, Texas: It has a smaller footprint, and patrons pick up their food at a dedicated window from a conveyor belt. At Wendy's, delivery to cars in the parking lot is also looking different as it tests underground tubes and robots for food delivery.

Processes have also become more automated at restaurants and QSRs. Yum Brands is using AI to automate the kitchen flow, ordering, and delivery for thousands of its Pizza Hut locations. In the front-of-house, servers are now using wearables that receive notifications from the kitchen or Presto's tabletop ordering systems when patrons need refills or if they have allergies. For the back-of-house, ConvoSense offers AI that can automate the cooking and baking systems by recognizing the food put into the cooking equipment and automatically launching the correct preparation.

From Matradee—using lidar to carry food and work around humans—to Servi—serving food and drinks—to Cecilia—speaking 40 languages and serving up to 120 drinks in Israel—robots are automating more functions in restaurants and QSRs.

## WHY IT MATTERS

As patrons continue to accept less-human interactions when they see a return on their valuable time. These automations will be seen as a way to offer better efficiency for customers, help reduce errors, and potentially increase hygiene—all priorities for customers. They could open up possibilities for dark restaurants that function 24/7, a useful development for more mobile populations, transportation professionals, and vacationing families. Yet automation could also become a sticking point for companies considering whether traditional sit-down-dining or autonomous restaurants offer a more lucrative path for either franchising or setting up a subsidiary brand. With a more mobile and connected world, however, automation offers the potential for consistency of experience no matter where patrons engage with your restaurant and food. It can also help the current issues due to a reduced labor force. However, it will shift future generations' expectations of what dining experience should look like and adds a layer to the categories of traditional, QSR, and now autonomous. Established QSR brands trying to become more efficient will want to consider hefty renovations to turn human-run locations autonomous.

## 1ST YEAR ON THE LIST

# EVERYWHERE ORDERING AND ANYWHERE DELIVERY

## WHAT IT IS

**Customers can order food for delivery almost anywhere now, especially with new tracking software and apps. This trend includes voice ordering, the use of kiosks, live tracking of deliveries, and new forms of delivery for restaurants and QSRs.**

## HOW IT WORKS

Like other areas of the industry, voice ordering is becoming more integrated in the food ordering process and will become ubiquitous. SoundHound's new partnership with Oracle will further enable voice ordering at more point-of-sale locations—the platforms use AI to help patrons order and get information on deliveries and locations. Customers can dictate their order from Uber Eats to Alexa devices, and then ask those devices for delivery updates. Through a partnership with Yobe, PLNT Burger uses kiosks with voice ordering to ease how patrons order. Grubrrr, a Florida company that offers self-ordering systems, claims that AI in kiosks can actually increase the amount of money patrons spend, which has been corroborated by other studies.

For deliveries, Whataburger partnered with geofencing provider Radar to enable the QSR to know when patrons arrive to pick up their food. Domino's launched its Pinpoint Delivery system, which lets patrons select their exact delivery location, expanding the chain's delivery offerings. Flytrex could help with this endeavor as well, as it is offering drone delivery to US suburbs for any need, including coffee. Alternatives to major delivery platforms are also expanding. Coca-Cola's minority stake acquisition of Thrive in India signals that more restaurants in that region will soon be able to create their own direct-ordering platform. And with apps like Wonder, cooking can also happen nearer to customers, even just outside their home in a van. In an interesting take on ordering, a new app launched at CES lets you designate a time and a place to use a nearby restaurant's bathroom.

## WHY IT MATTERS

Ordering systems now need to be integrated into more locations and be interoperable so that restaurants and QSRs don't lose out on patrons who want to conveniently order from anywhere, even while walking down the street. The granular bifurcation of delivery spots presents both challenges and opportunities. Customers may expect mobile delivery, which means delivery drivers will have to track customers, versus customers tracking drivers. This reversal of roles means that customers will share new forms of data that could help autonomous restaurants or mobile locations to serve those areas. Voice biometrics could become more important for verification services, with customers expecting you to recognize their voice and have their order ready based on them saying hello. While this type of data could give businesses more data to know their customer's needs, it also presents many issues for collection, storage, and privacy. Restaurants will need to establish guidelines for where ordering should occur, and might need to have new technology that helps resolve background noises and garbled messages, or that can offer live translation for customers who speak a different language. With drones and food preparation bringing food directly to the consumer, this also shifts service experiences, which have largely yet to be defined, and could be a way to differentiate these new offerings in the market.



## 1ST YEAR ON THE LIST

# MONITORING FOOD WASTE & IMPACT

## WHAT IT IS

**As climate change creates fear that food resources will be disrupted, many are focusing on being more responsible with their food waste. Many restaurant industry-focused startups are providing platforms for monitoring and mitigating food waste.**

## HOW IT WORKS

Increasingly, companies are interested in where their food waste ends up. Berlin-based Choco's streamlines the food ordering process, and monitors waste and food inventory. Other companies are using blockchain technology; Connecting Food uses food traceability data to track products going through the production line to audit the food, manage suppliers, and create a digital twin of the product, all with the aim of increasing consumer confidence. Currently used by Wendy's and McDonald's, Bolivian software company Mojix uses blockchain to automate food safety compliance, manage expiration dates, and reduce waste. It covers the lifecycle of an item to help provide traceability throughout the supply chain.

Therma provides services more directly to restaurants by offering IoT sensors for 24/7 temperature monitoring and an app that can help reduce waste and improve food safety. Brands including TGI Fridays, Domino's, and Wyndham Hotels use Therma to help protect their food inventory. Orbisk, a Dutch startup, puts a camera above a trash can to scan waste to help restaurants know their disposal patterns. Kilmato, based in Sweden, helps provide more data transparency for menu items: Their web-based app allows restaurants and QSRs to calculate the climate impact of their food and dishes and then label them to tell customers the carbon impact of their food. While focused on the grocery store rather than the restaurant, new AI scanners from a Dutch entrepreneur let customers scan avocados to see if they are ready for consumption.

## WHY IT MATTERS

ESG expectations are impacting businesses in a variety of ways, with many responding by publicly sharing their procurement, labor practices, and waste management. These systems and technology tools can help food producers, restaurants, and QSRs provide data to prove they're being responsible with their food waste. They can help now, but could ultimately be disrupted with the advent of more additively made food sources and materials, and it will be important to watch how restaurants balance these forces. In the near term, these new systems also offer opportunities for cost savings that can assist in addressing overuse and over preparation of food. In many regions, there are new regulations and requirements for this type of monitoring, and these tools can provide the data needed to show that companies are in compliance. For companies looking to tap into younger generations that care more about responsible consumption, addressing these issues will prove to be a beneficial marketing tool.

## 1ST YEAR ON THE LIST

# IMMERSIVE EXPERIENCES

## WHAT IT IS

**Eatertainment has evolved from breweries to be either mobile or permanent dining experiences that use technology to elevate the room, table, and decor.**

## HOW IT WORKS

Dining experiences continue to push the boundaries with more immersive experiences that have become their own version of performance art. Technology enables these experiences to move beyond just tasting, to even include using food to experience emotions. Philadelphia, the cream cheese maker, created a sensorial experience that uses visuals and sound, along with cheese dishes, to let customers experience a range of feelings and different emotions. In Silicon Valley, iChina is debuting the first headset-free VR dining experience that will pair visuals based on the food that's served. At the restaurant Ultraviolet, diners will enjoy 20 courses throughout the evening while the room shifts with projected images, changes in lighting, music, and scents. Inside Hard Rock Hotel Ibiza's restaurant, you'll find not only chefs but also directors and musicians. The guests will explore various places, times, and emotions over three hours through a VR headset at one of the world's most expensive restaurants at around 1,800 pounds (\$2,345) per person. Tablemotion Studios is already known for its experiences at the SLS Hotel Beverly Hills and Four Seasons Hotel Austin, but the company will debut a new interactive experience at The Culinary Institute of America at Copia in Napa and the Ritz-Carlton at Half Moon Bay in California. This new experience took over 50,000 hours to create; it uses visuals with 4K resolution and laser projectors.

## WHY IT MATTERS

As restaurants look to differentiate themselves by using technology to replace human-to-human contact with human-to-automated contact, these immersive experiences could become smaller in scale to still allow for more engaged experiences and storytelling. Along with more interactive social media marketing and selling, these immersive experiences could offer customization through social selling, which can provide new data to help companies adapt to market trends. They also provide revenue diversification as restaurateurs and even QSRs can separately sell both food and experiences. Immersive experiences are currently focused on high-end dining locations but could grow and scale to augment QSRs, or even autonomous restaurants. However, focusing on the storytelling and the "why" behind the experience will be key for companies to get this right. Some experiences may not make sense, especially if they seem extravagant given current world issues like war or climate change. But for hospitality venues looking to attract conferences or companies looking for new ways to impress clients, these offerings could become a norm once they become scalable—and extend to digital wellness offerings at both restaurants and other hospitality locations.

# SCENARIOS

## SCENARIO YEAR 2027

### **Eating Darkness**

As autonomous QSRs have taken over in fast-casual dining, Eating Darkness experiences began to dominate some traditional dining establishments. Many restaurants realized they needed to counterpoint to the tech-driven experiences many diners chose throughout the week; it started with lowering lighting levels over the course of the meal until the guests were eating in complete darkness but soon became augmented with technology that focused on visual well-being and comfort that increased the importance of the food the patron was eating. Now, many patrons choose Eating Darkness as part of their reservation, which means that they are offered a light-weight diminished reality band to don as they sit. They use it to choose the level of activity they see around them throughout the course of the meal, and their awareness will slowly fade to focus on just the food. Some describe it as a quiet hug and a shift away from the hustle and bustle of the world around them. The band facilitates the guest's order through voice ordering, and then provides a choice of ASMR noises, which also grow fainter throughout the meal. While this is good for single diners, cordoned-off diminished reality rooms are available for groups that provide the same experience, but are based on the group's shared preferences.

## 1ST YEAR ON THE LIST

# ENGINEERED FOOD AND MEALS

## WHAT IT IS

**As a means for better health and sustainability, many restaurants are working to incorporate and offer lab-grown and engineered food. Some foods and meals are being engineered for specific customer engagement experiences that go beyond dining.**

## HOW IT WORKS

Many companies are providing engineered food and meals to both restaurants and individual customers. In 2019, Foodadvisor began giving customers the ability to see what they are eating and to analyze its nutritional value. It also provides customized plans and advice on how to meet personal goals. SnapCalorie, a startup founded by the creator of Google Lens, plans to do something similar by using AI to estimate the caloric content of food based on a photo. What makes this app different from the rest is that it claims it can measure portion sizes.

Within 3D-printed food, several companies are working to bring engineered food to the mass market. Vienna-based company Mycorena has launched its whole-cut vegan salmon filet. This filet relies on new technology from Revo Foods that uses extrusion methods to integrate fats into fibrous proteins in a first-ever continuous production process for mass production. Researchers at Columbia University have combined 3D printing and laser technology to create and bake the first 3D-printed cheesecake; while this technology is not new, the researchers are considering what it would mean to create recipes like this for the masses to be able to download and use. Open Meals first began producing bio-metric 3D-printed meals in 2019, but it is looking to expand with a fully autonomous restaurant with their products by 2035—and with the possibility of AI-controlled 3D printers, could be available as a common kitchen appliance by 2040. Other foods being 3D-printed include chocolate, pasta, chicken, and steak.

## WHY IT MATTERS

With personalized nutrition and food allergies increasingly in focus and a concern, 3D-printed foods offer new possibilities for alternatives and food prep. This can help reduce potential for cross contamination, as long as the materials used for the printed food are managed and monitored as well. The challenge will be the visual aesthetics of these foods and consumers accepting that their traditional cheesecake or meats will look different but taste the same. This is ultimately something that should be consumer tested and trialed, from which companies should create large-scale marketing campaigns. Since engineered meals and foods also offer more sustainability and nutritional capability, if they can be printed to taste the same as unhealthy or nostalgic foods, they could potentially make unhealthy food less attractive. The control of taste will become the key driving factor for success or failure, meaning customers will want their dish to taste different than what their neighbor might be tasting. Such an achievement would unlock new potential for customized experiences and foods. While the culinary world is constantly trying to innovate, this offers a new arena for new types of chefs and business offerings. Scientists and material fabricators could become the culinary geniuses of tomorrow.

## 1ST YEAR ON THE LIST

# VERIFIED LOYALTY PROGRAMS

## WHAT IT IS

**Digital loyalty programs are increasingly looking to blockchain technology for verification of customer spending and offering new rewards for those engagements.**

## HOW IT WORKS

Many loyalty programs are utilizing technology for increased engagement, and blockchain technology is at the forefront for many companies. One new offering is Blackbird: a loyalty program that gives partner restaurants a digital card to track and verify when customers visit and what they eat on Coinbase's Base blockchain. These programs allow restaurants to create any kind of loyalty program they want: They can be free and help track the number of visits, or paid and used to offer perks and experiences. KitchData, known to enable delivery-first food brands, is now offering their clients the ability to create NFTs, SMS crypto wallets, and other Web3 offerings through Harmony.one's blockchain.

Companies are now exploring facial recognition technology to create more personalized experiences for loyal customers. Diners can choose to participate, and, in doing so, be recognized when they arrive at the restaurant. FaceME is one such platform that can offer this to restaurants, and it can be integrated into kiosks and other customer touchpoints. Tattle, a customer experience improvement platform, is working on new ways restaurant companies can get data from their customers by offering programs to incentivize customers to scan their receipts.

## WHY IT MATTERS

These new loyalty programs can obviously help increase customer engagement and retention, and can also provide an attractive experience to draw in new customers. The data and insights on customer preferences collected will be a critical component that companies will be able to understand and influence. The programs can also potentially reduce administrative costs as they become fully automated. The use of blockchain also provides consistent transparency, which will build trust among customers—but it will be key for companies to discuss and understand what level of transparency will be required. Past attempts at loyalty programs should also be a consideration because what may not have worked in the past may become functional today with these augmented offerings. The verification offered through blockchain technology further enables customers to have a frictionless dining experience, with the goal of creating diners who not only purchase food from the restaurant but also visit the restaurant's physical location.

## 1ST YEAR ON THE LIST

## CURATED TASTING

## WHAT IT IS

**AI and other technology are being used to craft menus and meals customized to individual customer preferences.**

## HOW IT WORKS

Personalization is growing in the restaurant industry, with AI offering new ways to customize your dining experience. Hungryroot, based in New York City, uses a quiz to identify what food you should order from the grocery store. AI platform Nutrios creates a custom page that then offers curated meal plans and personalized food recommendations. AI is also being used to make menus better. Lunchbox is a tech startup that uses AI to generate food images for restaurants to incorporate into their menu. Focused only on the restaurant industry, website platform company Superorder has worked with over 1,500 restaurants to create a website based on typing in a simple query.

Robotics may soon offer more personalized food that tastes best for consumers. A recent patent is exploring using AI to determine when a dish has met the right flavor requirements using particle data. Beko and the University of Cambridge trained a robot chef to know if food was too salty. The robot mimics how humans chew food in order to taste the food in a similar manner. You can now also taste your TV. A Japanese professor created a lickable TV screen that can imitate different food flavors; this comes after a researcher at Meiji University created a tool that allows a user to taste anything they want without having to eat the food. NTT Docomo, Meiji University, and H2L have also developed a unique technology that allows people to share tastes digitally.

## WHY IT MATTERS

With curated tastings comes the opportunity for generating new experiences and customer retention through positive and personalized foods. The personalization of flavor means food may become individualized, similar to how engineered food flavors could become personalized; this could make it challenging to create a menu, unless you use AI or other automation tools. Eventually, we may see menuless offerings, where the menu is never posted or decided until the customer walks in to be served. All of these developments combined could become problematic for the back-of-house to create nuanced flavors—again, unless the capability is technologically enabled. These new additions to the tech stack will be hard to implement unless costs are shared or the company has deep resources. However, many demographics share the same taste profiles, which could be a way to target the implementation of certain curated tastings and menus. Globally, this would obviously change and be a challenge as well. Companies should also prepare for a future when ratings of personalized flavors become as influential as a review of the experience—the focus will shift away from styles or cuisine categories toward new flavor categories.

# SCENARIOS

## SCENARIO YEAR 2026

### **Your Chicken Soup for the Cold**

Hello viewers, it's Chef Gordon Ramsay's avatar. Welcome to today's AR news segment, projected by your desk lamp sponsor. Our topic for you curated listeners who checked you like food news is about another food fad. In 2026, the latest craze to hit dining since butter boards and mood foods is chicken soup. People are absolutely going mad over chicken soup, lining up at any mobile pickup window they can find, or rushing out when their wearable pings that a new location has been set up near them. You may be confused, as many of us were at first, why chicken soup would be a fad-worthy food. It's because of the brilliant integration of medicine into Campbell's freshly printed soup paste. It sounds quite dismal but is actually on point because it tastes exactly how you remember soup from your childhood.

Yes, you heard me right.

When Campbell's entered the mobile QSR market with this product a year ago, I thought they must have lost their heads, but I was quickly corrected when I went for my first tasting. After a quick lick of the lickable menu, which analyzed my saliva memory, I spoke my order to the menu. It analyzed my voice to tell if I was sick, and then gave me a hot cup of curated soup designed to keep me well during cold and flu season. With the first sip, I could instantly tell this would be a hit. It felt like the recipe my mum used to feed me when I was a young lad. It created such a strong memory that I instantly went back to order the Campbell's Soup Dropper for all of my restaurants. The taste alone made it a fad, but the benefits of not having to take ill-tasting medicine when you are sick have also got customers salivating for this soup. It has become a bestseller for any restaurant that installs the Dropper.

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Before FTI, Mark worked as a workplace strategist, designer, design researcher, and futurist for clients across the country, most recently through his role as Director of Innovation + Research at a design and architecture firm.

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# ABOUT FUTURE TODAY INSTITUTE

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## About Us

Founded in 2006, Future Today Institute is an advisory firm specializing in strategic foresight, driving corporate strategies that lead to long-term success and resilience.

Future Today Institute partners with global business leaders to navigate disruptive change and uncertain futures with confidence. We fuel actionable strategic decisions that prepare you to take on global challenges, create sustainable value and ensure long-term growth.

As the global leaders in strategic foresight, our rigorous data- and research-driven methodology positions us to anticipate the unexpected and develop strategically driven roadmaps to manage risks and take advantage of opportunities today, tomorrow and into the future.

We empower leaders to make better decisions about the future, today.

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# METHODOLOGY

Future Today Institute conducts in-depth qualitative and quantitative research throughout the year to identify emerging trends. We review patent and trademark filings, pre-print and published scientific papers, investment rounds, online search trends, macroeconomic data, publications from governments worldwide, news mentions, influencer posts and other sources, and we use a proprietary system to identify patterns, which are then grouped into nodes and evaluated using a set of standardized indicators. Qualified trends are further scored for their trajectory, momentum and timing. Additionally, we harness the deep subject matter expertise of our Future Today Institute network, leading to valuable insights about the topics we cover.

In continuous publication since 2007, Future Today Institute's annual report includes maturing and emerging trends grouped into two categories: industry and technology. Industry trends reflect the ways in which technology is shaping the future of an entire industry. Technology trends are specific developments within one arena, such as artificial intelligence. Covering a wide range of technologies across industry sectors creates a holistic view of change and provides leaders with a clear understanding of their potential impact. Trends are published as individual Industry and Technology reports, as well as in one combined report with all of our research.

Monitored regularly, trends help executives recognize emerging threats and opportunities in the near-term and enable them to develop perspectives, strategies and plans for the future.

## Future Today Institute's Strategic Foresight Methodology



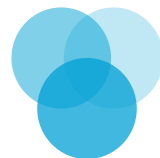
### SIGNALS & LONG-TERM TRENDS

**What is  
INFLUENCING  
the future?**



### GLOBAL MACRO SCENARIOS

**What is  
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### STRATEGIC

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