

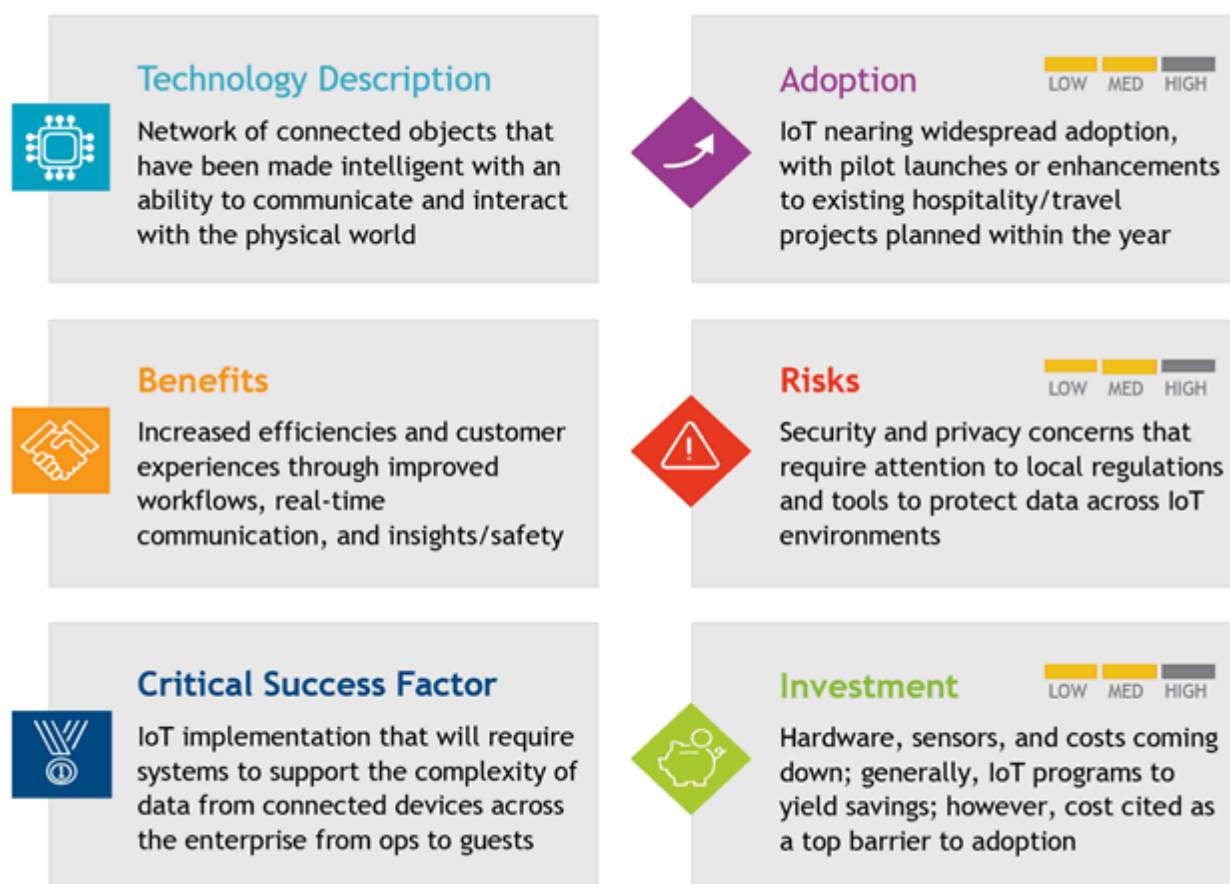
# IDC TechBrief: IoT-Enabled Hospitality and Travel

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## IDC TECHBRIEF FIGURE

FIGURE 1

### IoT-Enabled Hospitality and Travel: Snapshot



Source: IDC, 2021

FIGURE 2

IoT-Enabled Hospitality and Travel: Executive Description

	<p><b>Technology Description</b></p> <p>The network of physical devices, vehicles, buildings, and other items – embedded with electronics, software, sensors, and network connectivity – that enables objects to collect and exchange data</p>
	<p><b>Business Value</b></p> <p>Value that is realized by organizations being able to do more with less; efficiencies through IoT investments that achieve on top business objectives – increasing customer satisfaction, improving productivity, and cutting costs</p>
	<p><b>Financial Investment</b></p> <p>Costs that vary depending on an organization’s existing infrastructure and what it hopes to achieve with an IoT rollout; fees that will depend on network needs, number of locations/assets, and the size of a property</p>
	<p><b>Urgency</b></p> <p>High demand and expectations from guests/travelers for connected experiences; from an operational efficiency standpoint, IoT key for predictive systems maintenance asset tracking, sustainability, and guest/employee safety regulations</p>

Source: IDC, 2021

For hospitality and travel, Internet of Things (IoT) presents unique opportunities for organizations to blend hyperpersonalized and digital experiences for both guests and employees to increase efficiency and satisfaction. IoT has moved past the alchemy phase as use cases have been proven successful, from splashy guest-focused experiences like Disney's MagicBand and Carnival's OceanMedallion to U.K. hotel operator, RBH Management, using IoT to manage utilities and provide a real-time view of usage and carbon footprint.

IDC defines the IoT as a network of uniquely identifiable endpoints, or "things," that autonomously connect bidirectionally using Internet Protocol (IP) connectivity. At a broader level, IoT includes a broad range of business strategies enabled by a platform that creates a network of connected objects that have been made intelligent with the ability to communicate and provide data and insight back to the organization. These IoT devices typically provide a combination of sensing, computing, and controlling capabilities. Examples include wearable sensors, luggage tracking, door locks, environmental controls (i.e., thermostats and lighting), in-room televisions, cameras, refrigerators, and guest/traveler devices.

Overall IT investments in hospitality and travel are focused on delivering outcomes for key business priorities including improving efficiencies, increasing profits, and increasing customer and employee satisfaction. Top IoT deployments planned for hospitality and travel providers, according to IDC's *IoT Decision Maker Survey* (July 2021), paint a picture of what an IoT-optimized travel experience would look like from frictionless journey for guests to streamlined operations for enterprises.

Key focus areas for hospitality and travel IoT projects:

- Employees (to drive worker safety and foster workforce communication)
- Buildings (smart lighting/building management)
- Mobile assets (asset tracking)
- Video (security surveillance/crowd monitoring)
- Supply chain (inventory management)
- Consumers (wearables and smart appliances)
- Security (alarm systems, physical access, and remote monitoring)
- Utilities (smart meters and water meters)
- Environment (climate monitoring and temperature control)

FIGURE 3

### IoT-Enabled Hospitality and Travel: IDC's Adoption View

IDC's adoption scenario viewpoints	Adoption	A quarter of hospitality organizations have at least one IoT platform in use, and roughly 49% have two to four.
	User profile	IT teams lead IoT projects but will need to collaborate and share skills/information with operational teams, including networking and security.
What it means for business executives	Use case	IoT provides a combination of computing, sensing, and controlling capabilities, including environmental controls, TVs, phones, door locks, and cameras.
	Metrics	KPIs to measure include waste reduction, increased efficiency, cost reduction, improved safety, customer satisfaction, and loyalty driving increases in revenue.
	Customer impact	IoT is applicable to a large range of industries and use cases that scale from a single device to cross-platform deployments made up of hundreds of devices.

Source: IDC, 2021

IoT usage will continue to accelerate as consumers demand and increasingly prefer contactless service methods. The pressures of COVID-19 on hospitality and travel have exposed how contactless technologies make many guests feel safer and provide the added advantage of convenience. According to IDC's September 2020 *Consumer Experiences Survey*, 23.2% of consumers said they would prefer virtual customer service activities to persist post-COVID-19. In addition, 45% admitted preferring contactless customer service and 44% prefer contactless check-in.

The willingness of guests and travelers to interact with, conduct business through, and consume information solely through digital channels was accelerated by the health risks exposed during the global pandemic. This was heightened in hospitality and travel environments – two industries keenly impacted by shutdowns and travel restrictions. As travel resumed, the applicability and value of IoT platforms has become even more apparent. Hospitality and travel organizations are prioritizing Internet of Things strategies with 42% of hospitality organizations planning to increase IT spending in this area, according to IDC's November 2020 *COVID-19 Impact on IT Spending Survey*. IoT also offers organizations solutions to alleviate staff pressures, which is paramount as many hospitality and travel organizations continue to struggle with persistent workforce challenges.

The momentum for IoT adoption in hospitality and travel has picked up pace, with 83.3% of operators having already deployed a project and 16.7% planning to launch within a year, according to IDC's July 2021 *IoT Decision Maker Survey*. Of that majority that already deployed IoT projects, 44.4% plan to expand upon the rollout within two years.

In addition to customer experience and efficiency, IoT is becoming more in demand as a way for organizations to tap into new revenue streams and adjacent industries. Business diversification and identifying alternative profit channels became increasingly important for resilience during the pandemic, and IoT strategies have enabled hospitality and travel to tap into alternative profit channels. Having access to the robust customer data that can come from connected ecosystems can offer hospitality and travel operators insight into areas of opportunity and ways to capitalize on guests' needs while they are on property or in transit.

## Technology Road Map

Hospitality and travel are ripe for IoT adoption with several areas of low-hanging fruit. Labor and utilities are often cited as organizations' two highest cost centers. IoT devices offer opportunities to reduce operational costs and drive efficiencies in both areas by connecting items and devices across a property. This can ensure ease of monitoring and a reduction in efforts of a staff member manually logging status of utilities. Connected items to solve for these issues could include elevators, door locks, lights, thermostats, smart TVs, environmental units (AC/heat), alarm systems, HVAC, utility meters, environmental sensors, and smoke detectors. Once an ecosystem of these connected points exists, hospitality and travel IoT rollouts can address the following areas:

- **Safety:** An area of growing interest and importance in hospitality – and other industries as well – are safety buttons/alert technologies (aka panic buttons). This IoT technology has gained traction as governments and municipalities around the globe have instituted regulations around emergency alert requirements and regulations and will require an element of location-awareness or monitoring. The importance of guest and staff safety will drive investment in technologies with location-based capabilities. IDC data says a quarter of organizations plan to add proximity monitoring, according to IDC's September 2020 *COVID-19 Impact on IT Spending Survey*, which would include wearables and any applications able to provide tracing and alerts. Valuable minutes can be saved by directing security or other emergency personnel to the correct vicinity. Occupancy sensors and facial recognition will also offer added safety capabilities for IoT platforms. Wireless door sensors can raise an "open door" alert and provide data to inform security details on that entryway – such as if it has been propped open and for how long.
- **Asset tracking:** Monitoring the status of equipment such as baggage, luggage carts, delivery trays, cots, minibars, housekeeping trollies, and service trays can be done by outfitting items with smart sensors to track the location where an asset is deployed. Other items that are already smart can emit cellular sensors to enable them to be tracked. This prevents loss and streamlines service as staff can easily collect needed items and deliver them to where they are most needed in an efficient manner.

Applications for asset tracking often are more viable financially for organizations that have already invested in staff alert technologies. Prior to those deployments, systems for asset tracking were often considered too expensive as standalone solutions. Enterprises with location systems already in place can justify the incremental investment to cover additional locations for asset tracking. Using IoT systems for asset tracking enables overall efficiency and safety by reducing the time it takes to locate people and things.

- **Customer experience and service:** Smart rooms and connected experiences with wearables have gained traction with high-profile examples like Marriott's IoT Guestroom Lab powered by Legrand and Samsung technologies. Travelers are seeking frictionless journeys enabled by mobile keys, a technology that 17% of consumers told IDC they used for the first time or increased usage during the COVID-19 pandemic, according to IDC's September 2020 *Consumer Experiences Survey*.

Location awareness with wearables, device recognition, or other sensors is even more valuable as guests have become accustomed to order, takeout, and delivery from anywhere. Real-time location data can be leveraged to offer a higher level of service, enabling staff to deliver service anywhere even down to a boarding gate at the airport or a lounge by a pool. This flexibility enhances a property's ability to drive revenue. Rich data can also be mined from locations to see where foot traffic or service is driving the most business as well as what media assets are influencing orders, for example.

- **Sustainability:** IDC predicts that by 2024, 40% of hospitality brands will commit to sustainability with IoT, blockchain, and advanced analytics partnerships, reducing waste and their carbon footprint by 30%. Operators cite energy efficiency requirements (65%) and mandatory reduction of carbon footprint (47%) as two areas having profound or significant impact on their organizations, according to IDC's November 2020 *COVID-19 Impact on IT Spending Survey*, but such investments are predicted to also help brands increase customer loyalty as sustainability measures have been shown to garner guest support.

IoT technology – including sensors, RFID, cloud, and networks – will help find efficiencies and reduce costs and waste. IoT platforms that deploy geolocation technology can help reduce manual labor involved in monitoring environmental controls and alert staff to problems or potential issues in real time. IoT data can also identify which machinery or assets are most frequently used and where, analyzing efficiency and efficacy. Properties can then layer other attributes such as weather, climate, or traffic into analyses to obtain a clearer picture of the asset and its performance.

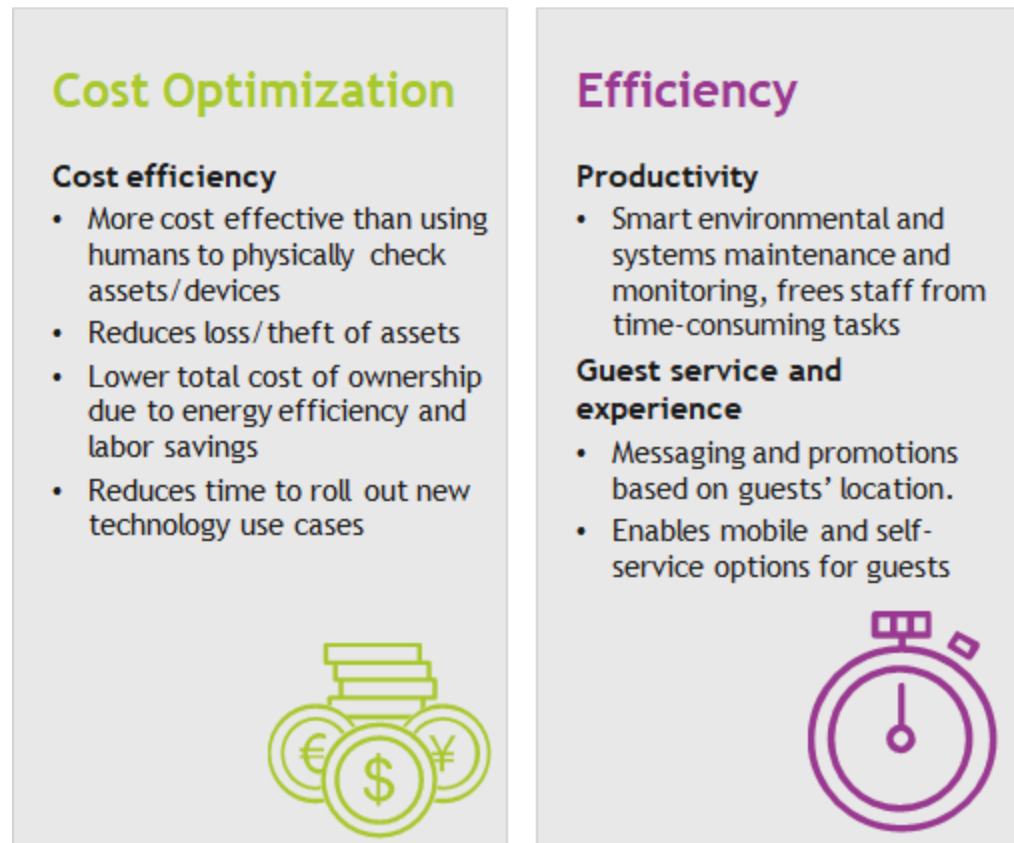
## Adjacent Technology Impact

The earliest use cases of IoT focused on making "dumb" objects "smart" by connecting them through a network, but that rapidly expanded to include connecting devices that were already smart. These capabilities, driven by advances in artificial intelligence (AI) and machine learning (ML) technologies, allow for greater communication and data gathering. As technology has matured, the IoT has become more complex as innovations like robotics and biometrics gain traction.

Edge technologies and increased adoption of 5G will facilitate IoT rollouts. A driving factor for IoT adoption is the ability to rollout new technologies faster and that trio – edge, 5G, and IoT – are all key to fostering rapid innovation for enterprises by reducing latency. Today, only 18.3% of hospitality and travel operators say they have already started to leverage 5G for their IoT deployments, but 12% have plans to within two years and 27.8% are considering it, according to IDC's July 2021 *IoT Decision Maker Survey*.

FIGURE 4

### IoT-Enabled Hospitality and Travel: Metrics That Matter



Note: IDC believes the metrics listed in Figure 4 are the best fit metrics to communicate value for this technology.

Source: IDC, 2021

IoT programs should align with top business objectives. Stakeholders must be able to set strategies for IoT to deliver against those goals. This is reflected in responses gathered from IDC's July 2021 *IoT Decision Maker Survey*, where hospitality and travel operators outlined the top 3 factors influencing investment or strategies in IoT as improving internal business productivity (37.3%), improving customer experience (32.5%), and improving service quality (29.4%).

### Communicate Using Metrics That Matter

Focusing on cost optimization and efficiencies, IoT use cases have shown measurable results in optimizing workforce and saving costs through waste reduction and increased productivity. Related to systems/equipment maintenance, IoT systems can deliver insights to organizations that can reduce



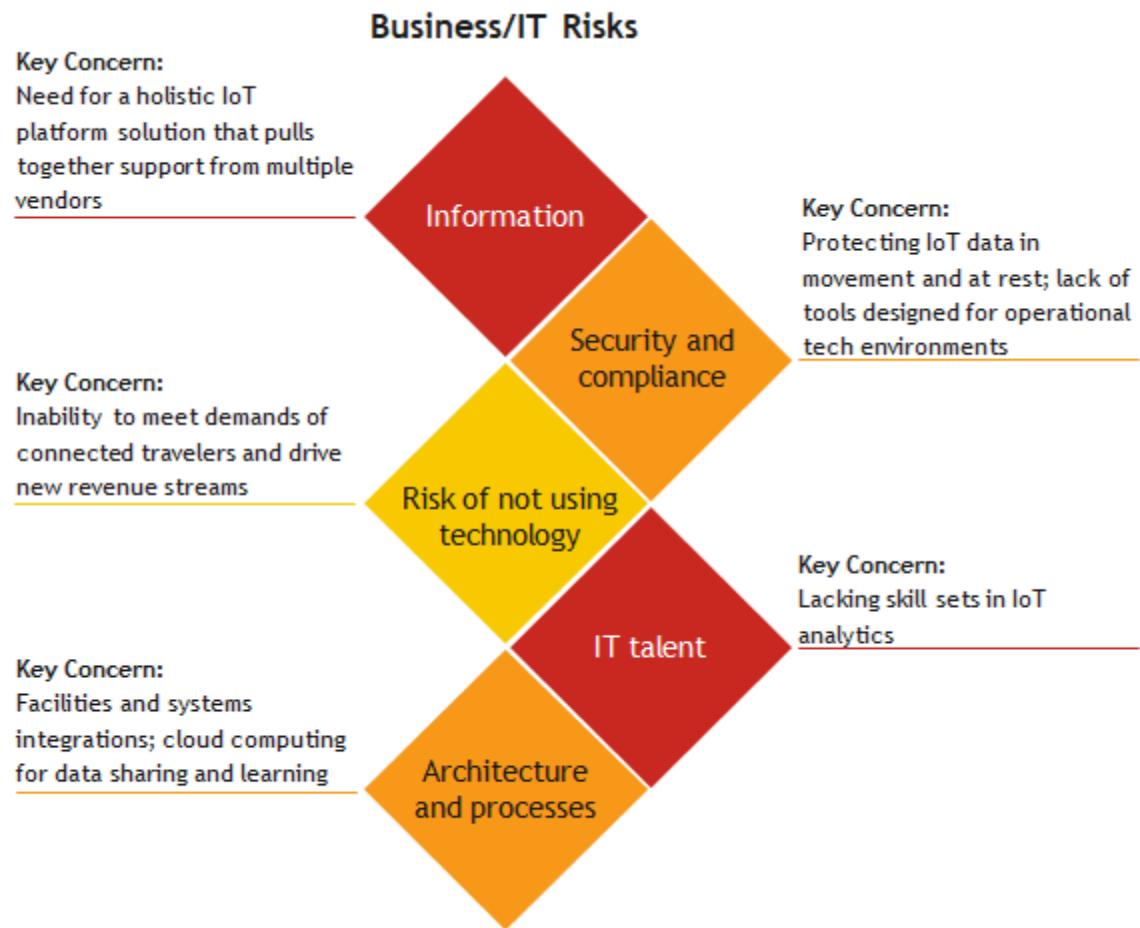
the cost of replacing, leasing, and over purchasing equipment to ensure availability. IoT platforms can also ensure that equipment is properly maintained, and usage can be optimized based on the data provided. Geo-notifications can provide alerts such as when service on a piece of equipment is due or might be needed.

For customer experiences, IoT platforms help to support self-service technologies – like self-check-in, mobile key, or order/deliver anywhere – that not only enhances customer satisfaction but optimizes staffing to where and when most needed, improving employee satisfaction as well.

RISK PROFILE

FIGURE 5

IoT-Enabled Hospitality and Travel: Risk Profile



Source: IDC, 2021



## Critical Risk Assessment

Hospitality and travel operators are most concerned about security risks of enabling IoT connected devices and systems. According to IDC's *IoT Decision Maker Survey*, security concerns are a top challenge holding back or impeding the progress of IoT projects for 27.8% of hospitality and travel organizations.

The common security questions to ask of IoT partners should include:

- What integrations are required?
- How are endpoints secured on the network?
- How is IoT data accessed and who has access to data generated from IoT devices?
- What information is collected, stored, and utilized by the IoT system?
- Is the information utilized by the IoT system encrypted, both while at rest and while in motion?
- What type of remote access to the IoT platform and supporting systems is needed by vendor personnel and for what purpose?

## Organizational Readiness Assessment

Adoption of IoT will require some capital investments if existing infrastructure will not support the desired IoT capabilities. This must be assessed and addressed prior to a rollout. Security and data privacy must take precedence in every step of an IoT project, especially as complex legacy systems will be updated or integrated with newer technologies. Concerns about technology stability, complexity of deployment, and the lacking capabilities of staff are premiere apprehensions for hospitality and travel operators when considering IoT projects. For organizations with these trepidations, they can consider partnerships with managed service providers and should look at IoT deployments in a phased approach to ensure desired outcomes are being achieved.

## CRITICAL SUCCESS FACTORS

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**FIGURE 6**

### IoT-Enabled Hospitality and Travel: Critical Success Factors

Critical Success Factor	Business Success Priority
Process	Data and insights gathered from IoT programs must be secure with an end-to-end framework to prevent attacks on connected devices. Data must be consistent.
People	The goals of IoT projects must be identified and clearly communicated. Provide KPIs and follow-through beyond merely advisory services.
Technology	IoT adoption is being driven by the acceptance/increased use cases of sensors, wearables, and smart homes/cars. Platforms must be ready to fold in advanced capabilities including voice, biometrics, and virtual and augmented reality while avoiding vendor lock-in.

Source: IDC, 2021

The applications and benefits of IoT in hospitality and travel but the fast pace of advancement and affordability necessitate cogent and cohesive communication to both staff and guests. Technology leaders at hospitality and travel brands must evaluate the IoT deployments that make the most sense for the organization to achieve operational and business goals. While devices can report on issues faster than humans, there will remain the need for a close relationship between humans and IoT systems to leverage the full potential of connected infrastructure.

IoT will enable greater efficiencies as well as the ability for organizations to be proactive with both operations and customer-facing interactions with alerts and actions. Organizations that have implemented IoT solutions have measured positive results in customer service, employee satisfaction, and customer sentiment scores. As travel returns to pre-pandemic levels, the need for digital touch points, connectivity, and data will be more critical than ever. IoT platforms will be mission critical to provide the level of service and increased demands for data and real-time insights.

## SELECT PRODUCT LIST

FIGURE 7

### IoT-Enabled Hospitality and Travel: Select Products

Product	Why Product Made the List
Alcatel-Lucent OmniAccess Stellar	Asset tracking identifies location of equipment or people, in real time, using tags with GPS, BLE, or RFID to broadcast location. OmniAccess Stellar uses BLE, which doesn't interfere with Wi-Fi and is less costly.
AWS IoT	AWS brings artificial intelligence (AI), machine learning (ML), and IoT together to make devices intelligent. Deutsche Bahn uses AWS IoT to gain new insights on its 6,500 trains running throughout Europe.
IBM Watson IoT Platform	This managed, cloud-hosted service platform connects sensors and devices through a cloud platform while collecting and securing data, running analytics, and gaining real-time insight.
Microsoft Azure IoT	Azure IoT Hub and Digital Twins allow clients to build solutions for complex IoT scenarios. Recently announced, OYO will develop Smart Room experiences on the OYO platform using Microsoft's Azure IoT.
Oracle IoT Cloud Service	This cloud-based managed platform as a service allows operators to connect devices to the cloud and analyze and integrate data with enterprise applications, web services, or other services by using REST APIs.
PwC Connected Solutions	PwC's IoT business combines sensors, networks, analytics, and dashboards to provide operational data. Connected Solutions products include indoor geolocation platform, remote data collection, and check-in.
TCS Aviana	Aviana is an AI/ML-based aviation suite that enables connected insights and intelligence for total enterprise visibility.
Virtusa CogniSense	This IoT platform includes edge, middleware, and cloud capabilities. The framework enables operators to begin an IoT journey in a vendor-neutral way, with an ability to scale as needed.

Note: This list is representative and not an exhaustive list of all market participants.

Source: IDC, 2021

In hospitality and travel, IoT is becoming a prevalent strategy and is driving partnerships across cloud, network, software, hardware, and services providers. The vendors represented on this select list have had success with pilots and executed or planned expanded rollouts with worldwide hospitality and travel brands.

PwC approaches the safety button issue from a unique angle. The Connected Solutions' Indoor Geolocation Platform (IGP) – which includes rapid-response buttons – was designed in collaboration with leading hospitality brands to avoid reliance on Wi-Fi and in-room beacons, which can be costly to install/maintain and unreliable. IGP uses its own IoT network with one antenna per three to four floors to ensure coverage.

In September 2021, Microsoft confirmed its investment in India's OYO in a multiyear strategic deal to codevelop travel and hospitality products. As part of this alliance, it was announced that OYO will use Microsoft's Azure IoT to develop Smart Room experiences including self-check-in, smart locks, and virtual assistants.

## LEARN MORE

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### Related Research

- *IDC Market Glance: Frictionless CX in Hospitality and Travel, 4Q21* (IDC #US47249421, November 2021)
- *IDC FutureScape: Worldwide Hospitality, Dining, and Travel 2022 Predictions* (IDC #US47777521, October 2021)
- *IDC PeerScape: Hospitality and Travel Peer Insights for Leveraging Artificial Intelligence* (IDC #US47252621, September 2021)
- *What Role Will Artificial Intelligence Play in the Recovery of Hospitality, Travel, and Dining?* (IDC #US48090521, July 2021)
- *IDC PlanScape: Workforce Optimization Technologies to Empower and Engage Employees* (IDC #US46706121, July 2021)
- *IDC's Worldwide Digital Transformation Use Case Taxonomy, 2021: Experiential Hospitality, Dining, and Travel* (IDC #US47863921, June 2021)
- *Why Restaurants and Groceries Ain't Afraid of No Ghost Kitchens: Dark Kitchen Trends and Technology Close Convenience Gap* (IDC #US47729621, June 2021)
- *IDC PlanScape: Digital Signage to Maximize ROI* (IDC #US47249021, March 2021)
- *Innovation Investments for Digital Resiliency in Hospitality and Travel* (IDC #US46705921, March 2021)
- *Strategies for Digital, Data-Driven CX in Hospitality and Travel* (IDC #US47522521, March 2021)
- *Top Contactless Investment Areas for Hospitality and Travel Business Processes* (IDC #US47406621, February 2021)

### Synopsis

This IDC TechBrief assesses the business value, adoption considerations, key metrics, critical success factors, and leading vendors of Internet of Things (IoT) solutions for hospitality and travel environments – including hotels, airlines, and cruise lines. IoT deployments are delivering benefits in both customer- and employee-facing circumstances by increasing efficiency and improving customer satisfaction by reducing customer touch points with staff; freeing workforce from repetitive, menial tasks; and providing opportunities for hyperpersonalized, location-aware service and engagement.

"The integration of IoT technology in hospitality and travel industries will see steady increases as workforce challenges and customer experience needs evolve," Dorothy Creamer, research manager, Hospitality and Travel Digital Transformation Strategies at IDC. "In the near term, IoT use cases in hospitality and travel will solve immediate demands for contactless service options, security and safety issues, and environmental efficiencies. Longer term, the layering of advanced technologies such as AI, biometrics, and voice capabilities will take IoT applications to the next level with greater capabilities to provide frictionless service to guests and travelers while improving employee experience and operational efficiencies."

## About IDC

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