PwC's Indoor Geolocation Platform – a Boon for Hospitality

ISG Provider Lens™

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Summary

The hospitality industry is investing significant resources on IoT. Indoor geolocation platforms, in particular, are emerging as powerful tools to address a wide range of critical business requirements. By accurately tagging and monitoring assets within a building, and by enabling the identification and tracking of guests and employees, indoor geolocation systems can streamline operations, increase productivity and enhance guest experiences. These capabilities are particularly relevant to hotels and resorts recovering from the impact of the pandemic. While travel and occupancy levels have rebounded, many businesses remain short-staffed, creating challenges around service quality and security.

PwC's patented solution, Indoor Geolocation Platform, combines sensors, networks, analytics and dashboards to provide a robust and cost-effective solution to enterprises in the hospitality industry. One key benefit is speed of deployment; installations are typically completed in a matter of days. Unlike many other systems, PwC's platform requires no beacons or in-room infrastructure.

Using existing RF signals, including Wi-Fi networks, to create fixed reference points throughout a facility, customers receive a customized, detailed building map that identifies response buttons or trackers in specific locations such as individual rooms and storage areas, but without adding any additional infrastructure that would require maintenance and involve additional costs.

Reliability is another advantage. The PwC platform includes deployment of an independent IoT network throughout a facility. Many indoor location systems, in the meanwhile, connect their devices using the Wi-Fi network maintained by a client, which, while acceptable for locating static assets, can be unreliable for tracking movement between rooms or from one floor to another due to the challenges associated with keeping the moving assets paired to Wi-Fi networks.

By continuing to refine its system and explore new industry applications and use cases, PwC is focused on maintaining its leadership position in this rapidly evolving market.

Briefing Notes

As a part of its participation in the recently published, IPL Internet of Things, Services and Solutions study, PwC briefed ISG analysts on its Indoor Geolocation Platform. Ranked as a Leader in the report's Mobile Asset Tracking and Management quadrant, PwC and its proprietary solution are recognized as an easy-to-deploy, infrastructure-lite, flexible approach to locating and tracking assets within enclosed spaces.

The briefing was led by Alec Massey, Partner for Connected Solutions at PwC U.S., and also included Clinton Reed, Products and Technology Lead for PwC Analyst Relations. The discussion focused on the platform's deployment in hospitality and included an overview of its features and benefits, and its adaptability to a variety of use cases, together with PwC's plans for future enhancements.

Challenges to Indoor Geolocation

In outdoor settings, GPS-based geolocation systems can identify and track location and movement of vehicles and goods with reasonable accuracy. Transportation fleet managers, for example, use these systems to monitor trucks and enhance logistics and scheduling, as well as ensure compliance with safety regulations. However, walls and windows weaken and distort GPS signals, resulting in inaccurate measurements. Also, GPS technologies lack usable altitude precision, thereby limiting their applicability in multi-story buildings.

Addressing this problem requires capturing satellite signals outdoors (typically from rooftops), and then relaying the signals inside the building. At present, most indoor geolocation technologies rely on

beacons and Wi-Fi connectivity to identify, locate and track various assets. The trouble is beacons are expensive to install and maintain, and also aesthetically disruptive. Moreover, it is a struggle to maintain consistent paired connection, using Wi-Fi, during movement, particularly between floors. Drawing on the existing Wi-Fi infrastructure also pushes those networks beyond their original intended use. These drawbacks are significant in a hospitality setting, where a geolocation solution is required to allow a guest to easily find, for instance, the hotel gym, or for management to quickly locate and direct a staff member to a room that requires attention.

From an applications perspective, a drawback of Wi-Fi- and beacon-based indoor geolocation systems in hotels is that they are often confined to point solutions, namely tracking housekeeping teams. This limits opportunities to leverage IoT capabilities for a wider range of benefits such as reducing energy costs through monitoring temperature and humidity, enhancing security by identifying intruders and gaining insight into guest preferences by mapping foot traffic.

Facility Fingerprints, IoT Networks and Base Stations

PwC's patented Indoor Geolocation Platform uses Wi-Fi and BLE signals to map reference points throughout a facility (for example, a particular guestroom), creating a geolocation database that is tailored to a customer's specific requirements, where scanning a location requires as little as 24 seconds. Following testing for accuracy and alignment with SLAs, the system goes live. The entire implementation process typically takes 1 to 2 days.

Indoor signal transport is provided through a low-powered wide area network (LPWAN) that operates independent of a facility's existing network infrastructure. The LPWAN deployment can include Macro Base Stations on rooftops or Mini and Micro Base Stations in telecom closets, creating a fit-for-purpose communication network, enabling location services throughout a facility. This approach also improves network security, which is compromised on typical building Wi-Fi implementations.

Figure 1. PwC Indoor Geolocation Platform
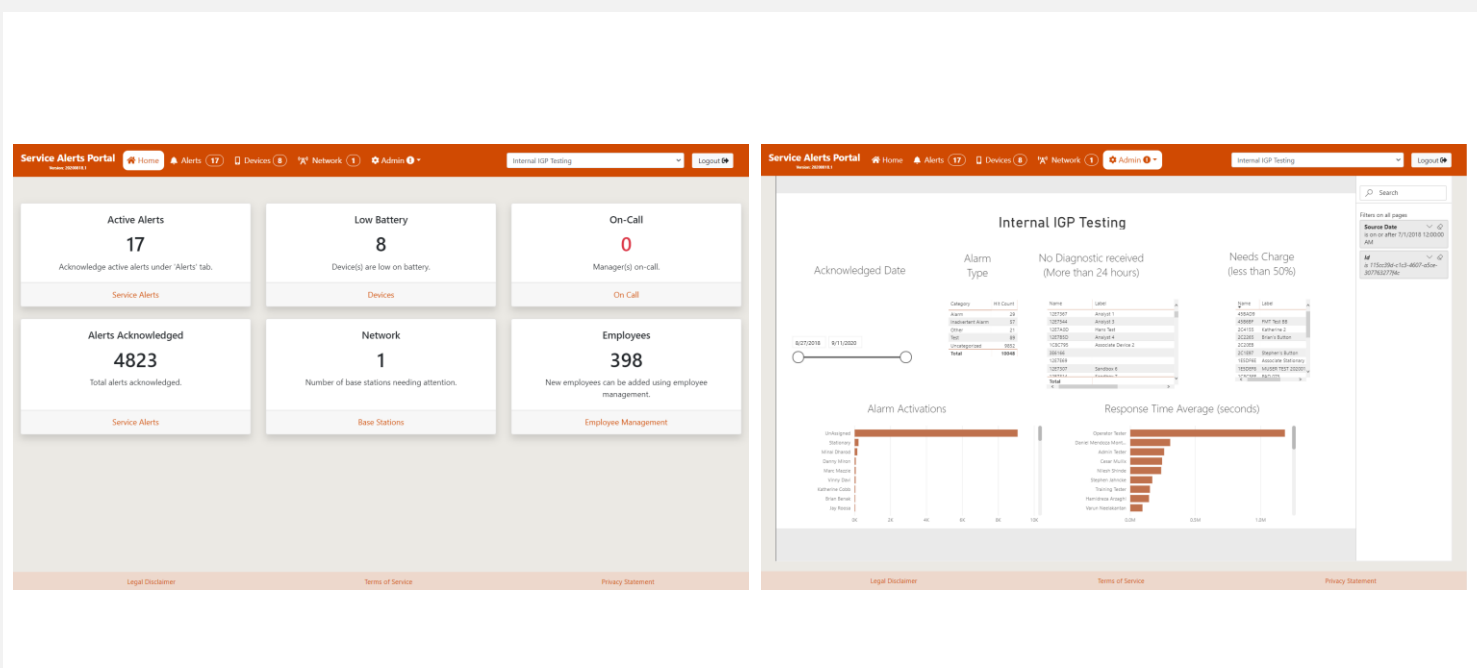
Source: PwC

Location Services

PwC's Indoor Geolocation Platform provides a variety of location services. At a basic level, location on demand allows an individual (typically an employee) to activate a sensor to alert colleagues on their location. Additional capabilities include last-known location updates (triggered by a motion starting or stopping), time-based location, aggregation of movement across zones and location during motion. A web-based dashboard tracks data over time, and generates historical logs and reports based on customer requirements.

Pricing and Support

Solution pricing varies, based on property size and the number of locations mapped. A one-time setup fee includes location buttons and network infrastructure, and the annual fee reflects the number of scanned locations and network base stations. Implementation of additional hardware involves acquisition and connectivity costs.

Post-deployment, PwC provides onsite or remote training on the use of the devices and online dashboard, as well as additional training following dashboard updates. PwC also offers 365/24/7 telephonic and email support over the duration of the contract, and provides onsite servicing to maintain SLAs at no additional fee.

Expanded Functionality

Beyond the foundational capabilities of location monitoring, PwC's Indoor Geolocation Platform underpins a wide range of IoT-related business benefits, including asset tracking and management. For hotels, benefits can include a complete view of the entire facility and quick access to in-room dining carts, ladders and wheelchairs. In addition, by integrating remote data collection, facilities can monitor utilities, and temperature and humidity levels to ensure guest comfort, while ensuring energy efficiency. These, and related smart building capabilities, will become critical as an increasing number of businesses prioritize carbon reduction and sustainability initiatives.

In the meanwhile, the use of data analytics enhances guest experiences: heat maps can gauge foot traffic and provide insights into popular resort attractions, sensors in rooms can collect data on how hot or cool a guest likes their room – on their next arrival, the room temperature can be adjusted to the optimal setting.

Hospitality Requirements

For hotels and resorts, the ability to quickly locate and direct staff in a large building, when a guest requires assistance, is critical to maintaining high-quality service standards. Providing a rapid response to a guest poses a challenge, particularly when many hospitality businesses are yet to return to pre-pandemic staffing levels. In the context of a classic "do more with less" environment, location monitoring serves as an essential tool.

Employee safety and security is another imperative. Industry regulators, as well as unions, increasingly mandate that all hotel and resort staff carry a rapid-response button or a similar device to easily call for help.

Summary of Benefits

Advantages of PwC's Indoor Geolocation Platform include the foundational capability of providing accurate, IoT-based location monitoring throughout an enclosed facility. This provides a critical functionality for businesses in the hospitality sector, and supports a broad range of operational and customer-focused applications.

Additional benefits include:

- **Improved aesthetics:** Does not require bulky beacons in rooms. This is an important consideration in high-end destinations that put a premium on room design and overall aesthetics.

- **Ease of deployment and use:** In addition to rapid installation, the solution is easy to use.

Employees equipped with location buttons do not require tablets or smartphones, and the button design minimizes false alarms.

- **Visibility:** A dashboard is accessible from any computer or smartphone.

- **Scalability:** It has the potential to expand and leverage additional IoT capabilities.

- **End-to-end all-inclusive IoT services:** One provider handles all technologies and associated services.

By combining low-impact deployment, high degree of accuracy and focused capabilities, PwC's Indoor Geolocation Platform offers a compelling value proposition to the hospitality industry.

Net Impact

Presence in Hospitality Market

PwC has established a significant presence in the hospitality market with its Indoor Geolocation Platform. The company reports that the solution has been deployed on more than 150 properties, with over 200,000 scanned locations and 20,000 buttons installed.

This success reflects PwC's ability to align its offering with key competitive and regulatory imperatives facing businesses in the hospitality industry in the wake of the COVID-19 pandemic. By optimizing efficiency and productivity, the solution allows hotels and resorts to deliver quality service with fewer staff members. This is essential in an environment, where occupancy rates are returning to near-normal levels, while significant labor shortages persist. Moreover, the platform's security functionality aligns with increased regulatory mandates and union demands to enhance the safety and security of hotel employees.

What's Next? Expansion to Other Industry Sectors

As a next step, PwC is exploring growth opportunities in Healthcare, specifically within hospitals. While the demand for location services is relatively nascent in this sector, interest is growing. Hospitals face pandemic-induced staffing shortages, similar to those confronting resorts and hotels. Employee safety and concerns over workplace stress are also major issues. According to the Bureau of Labor Statistics, 73 percent of workplace injuries in healthcare are due to violence. Location services solutions, with rapid response capabilities to issue alerts, can enhance security and also address legislative requirements of recently introduced bills such as the SAVE Act and the Workplace Violence Prevention for Health Care and Social Service Workers Act.

By providing a foundation for broader asset tracking, the Indoor Geolocation Platform can

also present, hospital emergency rooms often struggle to quickly locate equipment such as portable x-ray machines and ventilators. Nursing staff spend significant portions of their shifts simply looking for devices. In many cases, staff hoards equipment to make them readily accessible, thus contributing to bloated inventories. Asset tracking can also prevent theft. By using geolocation to create secure perimeters, assets can be equipped with sensors to issue alerts when a boundary is breached.

PwC's equipment monitoring solution helps hospitals manage inventory; extend the life of physical assets; and automate redundant, low value-add manual activities. Using a suite of cameras, along with vibration, temperature and acoustic sensors, PwC eliminates the dependence on manual readings to track and trend equipment location and performance. Analytics can be used for a variety of output, including work order and facility management automation, capital program management and support for sustainability efforts.

The solution is also designed to address the pressing need for hospitals to integrate disparate data sources, monitor new sources and glean meaningful insights from combined data sets. Here, PwC's Connected Platform enables enterprises to easily collect, store and analyze data from disparate sources, including PwC sensors, clients and/or third parties. In addition, investments in APIs are designed to make data accessible in multiple formats, either via dashboards or pushed to other client systems.

Equipment Monitoring and ESG Use Cases

At a high level, PwC sees a growing demand for equipment monitoring across a variety of use cases, including environmental monitoring and ESG-related technologies, which is emerging as a critical priority for many businesses.

The specific industry sectors PwC is pursuing include industrial products (material visibility through asset tracking), logistics, education and commercial real estate.

Evolving the Technology

In terms of advancing the functionality of the Indoor Geolocation Platform and related solutions, PwC's priorities include a next-gen design for both the rapid response buttons and asset trackers. These will be smaller and include additional capabilities and functionalities such as new chipsets that support different types of RF signals, including 5.0ghz Wi-Fi and Wifi6. PwC is also focused on enhancing analytics capabilities. SignalGraph, an IoT-focused graph engine, is designed to enable unique insights that integrate IoT data with data from other sources.

The company is also diversifying its business model, combining direct sales with licensing its intellectual property to allow key partners to white label the core technology.

Differentiators

PwC considers the breadth and depth of its expertise – including consulting, regulatory and audit teams – and presence across major business sectors as its key differentiators. The Connected Solutions practice is designed to integrate technology and IoT expertise with industry insights to identify the nuances of the diverse environments in which its solutions are being deployed.

Associated Research

- Internet of Things (IoT) – Global Summary – June 2022

- Hospitality Needs a New Tech Backbone to Meet 2022 Demand

- Twelve Important Value Metrics for Indoor Location Determination

ISG Placements and Recognition

ISG Provider Lens™ positioning: PWC has been recognized as a Leader and a Rising Star in the following U.S. reports for 2021 and 2022:

- Implementation and Integration Services for Large Enterprises, Salesforce Ecosystem Partners 2021

- Connected Mobility and Consulting Services, Internet of Things Services and Solutions 2021

- Technical Security Services, Cybersecurity Solutions and Services, 2022

- Mobile Asset Tracking and Management, Internet of Things Services and Solutions, 2022

# About the Author

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Alex brings 25+ years of experience in journalism, strategic marketing communications, PR and content development to his role as Principal Analyst. His areas of expertise include developing thought leadership-based content and communications strategies, particularly through ghost-authored blogs, press articles and white papers. In addition to IoT and manufacturing, he has covered topics that include Artificial Intelligence, RPA, outsourcing and digital transformation, as well as industry issues in retail, hospitality, banking, healthcare and other sectors. Throughout his career, he has specialized in making complex subject matter clear and engaging to both specialized and general audiences.

Summary Facts

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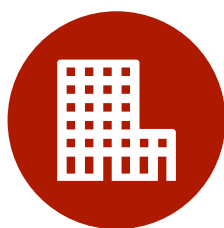
Headquarters

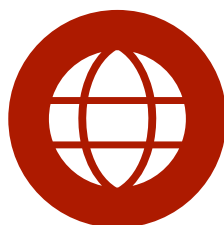New York City and
London (operates
in 156 countries)

Revenue

$45.1B
(FY21)

Employee Strength

295,300+
(719 global offices)

Markets

Global

Industry groups

Hospitality, Healthcare

*iSG®

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