ECOsmart by Telkonet

7 TRENDS FOR IoT IN HOSPITALITY

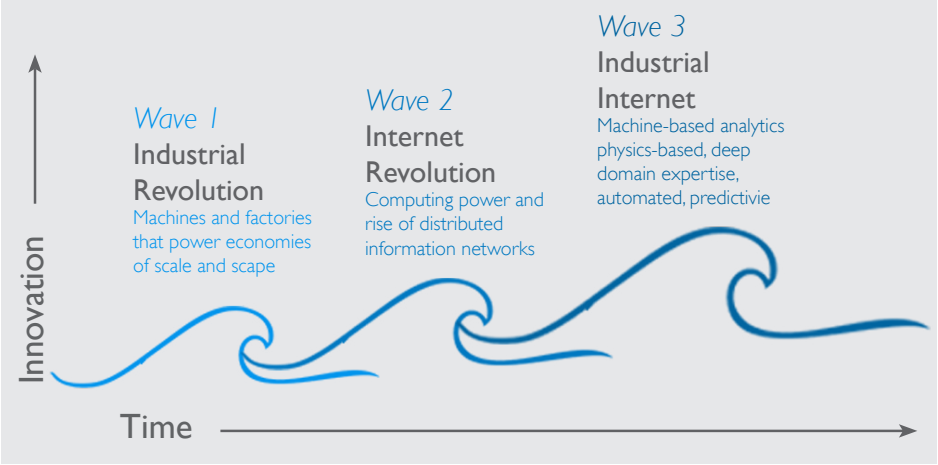
By: Jesse DePinto, Product Manager at Telkonet, Inc.

Technology powering the Internet of Things (IoT) is already revolutionizing traditional industries, hospitality is no different. With the rise of mobile adoption and the fall in costs associated with wireless sensor technologies, the growing IoT market is hitting a tipping point. The organizations of tomorrow must embrace this technological wave before getting left behind.

Introduction

There is no doubt that the Internet of Things will impact the way we do business today. Intel estimates that the number of connected devices will grow from two billion objects in 2006 to a projected 200 billion by 2020, or 26 smart objects for every human on Earth. What's more exciting is the potential economic impact of all of these new devices coming online. McKinsey & Company estimates a total potential economic impact of $3.9 trillion to $11.1 trillion a year by 2025 globally.

The Internet of Things an idea that everyday objects in the future will talk to one another to make the world a better place. Also known as M2M (Machine-to-Machine), IIoT (Industrial Internet of Things) or the IoE (Internet of Everything), the idea is so powerful that giants like GE are calling the Industrial Internet of Things the "Third Wave of Innovation" following the Industrial Revolution and the Internet Revolution.



The hospitality industry possesses great potential for increasing revenue and decreasing expenses by integrating IoT technologies in their operations. For example, a smart energy management system knows when a guest room is unoccupied or unsold and can automatically adjust the temperature to reduce energy consumption by as much as 20 to 45 percent. At the same time, a smart energy management system could also increase the levels of guest satisfaction by allowing a guest to adjust the lights and temperature using their hotel loyalty apps, TV remote or even voice interaction, all without leaving the bed!

To best implement IoT solutions in your business, consider these top seven trends that are already beginning to impact the hospitality industry today, from the guest room to the back of house.

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1. Guestroom Automation

It's no secret that hotel guests are demanding more technology every year to keep up with their busy lives. In the past, hotels have had trouble keeping up with the rising bandwidth capabilities for their guest Wi-Fi network. Tomorrow, the challenge will be to maintain the same levels of comfort and connectivity that travelers are accustomed to in their smart home.

The Smart Home

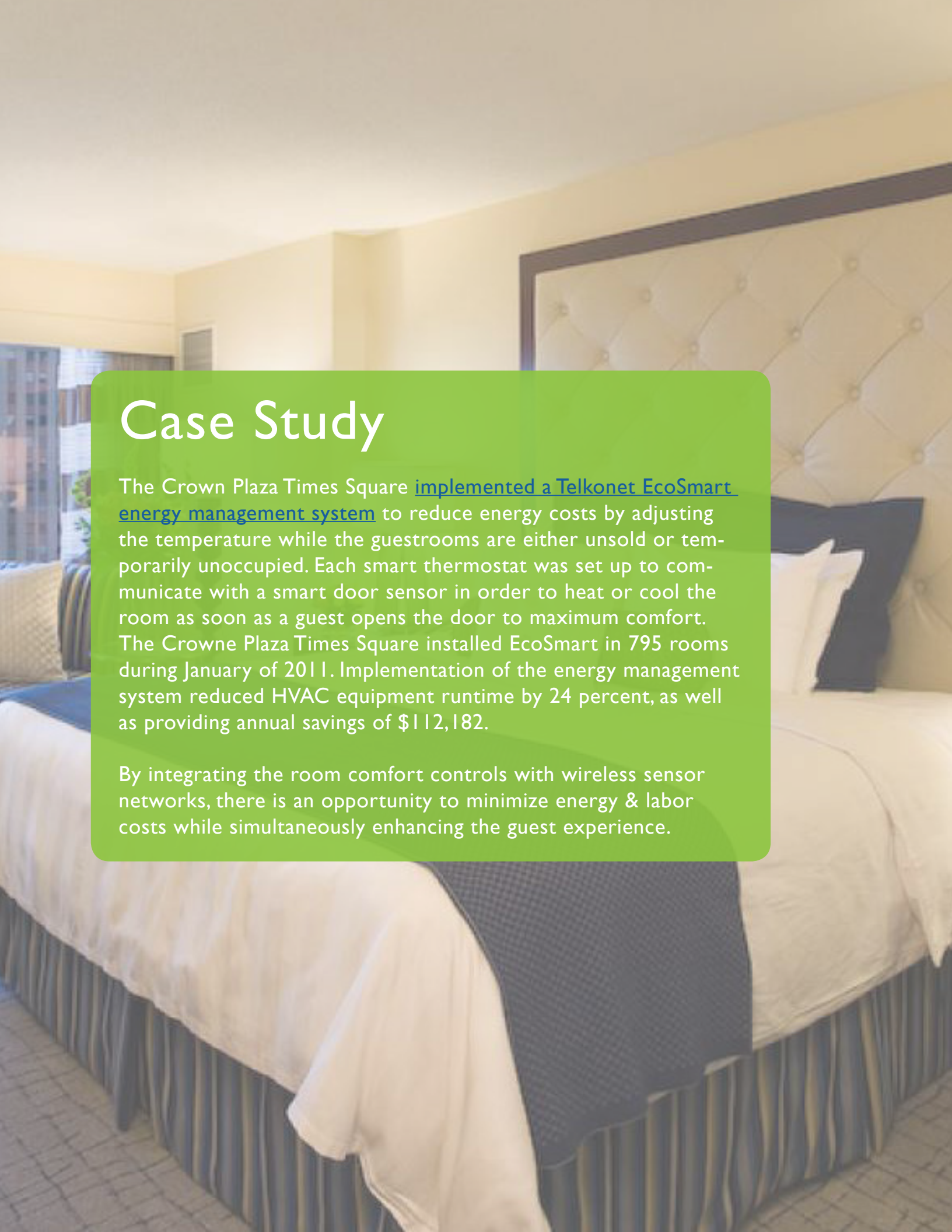
The idea of a "smart home" is beginning to take shape in the consumer market. From the smart lock to the smart thermostat, waves of intelligent products are flooding the market due to the dramatically lower cost of wireless sensor technologies over the past few years. In fact, 50 percent of the North American population admitted they were likely to purchase at least one connected device in the next year. It's estimated that a typical family home in 2022 could contain more than 500 smart devices! Motivations are varied, for example 23 percent of respondents were most excited about the smart home benefit of greater productivity and ability to manage work-life balance.

"The focus on the guestroom systems, such as energy management systems or reporting access control systems, make the thermostat or door lock more valuable as an integrated part of the hotel's technology via a shared network to the PMS. Combining the technology between multiple guestroom systems completes a full integration, invisible to the guest, but beneficial to the hotel."

Matthew Mrowczynski
VP Global Hospitality
SALTO Systems

Guestroom Technology Today

Guestroom automation provides a way for hotels to differentiate by keeping up with the smart home technology to make the guest feel more comfortable. For example, Starwood Hotels & Resorts utilized a technique called "daylight harvesting" to save energy and increase indoor lighting consistency by automatically adjusting the energy-efficient LED lighting based on the natural light detected coming into the room.



Case Study

The Crown Plaza Times Square implemented a Telkonet EcoSmart energy management system to reduce energy costs by adjusting the temperature while the guestrooms are either unsold or temporarily unoccupied. Each smart thermostat was set up to communicate with a smart door sensor in order to heat or cool the room as soon as a guest opens the door to maximum comfort. The Crowne Plaza Times Square installed EcoSmart in 795 rooms during January of 2011. Implementation of the energy management system reduced HVAC equipment runtime by 24 percent, as well as providing annual savings of $112,182.

By integrating the room comfort controls with wireless sensor networks, there is an opportunity to minimize energy & labor costs while simultaneously enhancing the guest experience.

2. Predictive Maintenance

Ubiquitous Computing = Predictive Insights

The world will soon be swarmed with sensors and controls reporting data to the internet. This year, it's estimated that 5.5 million new things will get connected every day. These sensors will do everything from turning on a light switch to predicting catastrophic failure in a GE Jet Engine, and spewing out petabytes (or one billion gigabytes) worth of data daily, known as "Big Data." Obtaining the right data will be trivial, the challenge will be to sift through all this data to obtain valuable and actionable insight.

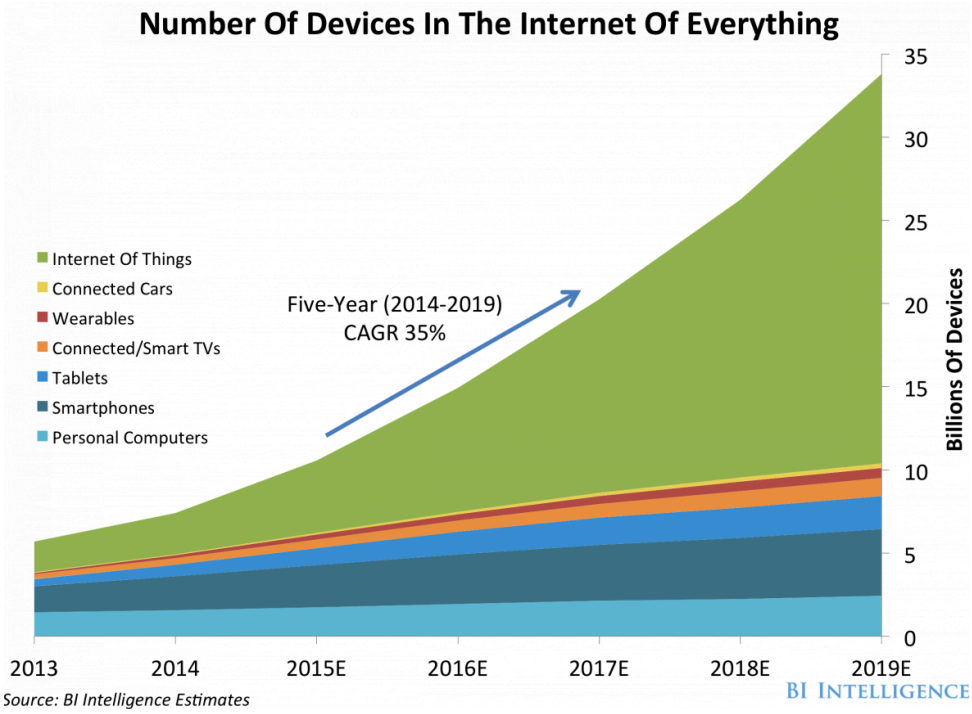
Preventative vs. Predictive

Building managers have been using preventative maintenance techniques for years to help prolong the life of the equipment and to minimize guest complaints associated with unplanned service issues. Preventative maintenance checks are typically scheduled every quarter or even less frequently, repeating every year. Predictive maintenance on the other hand takes preventative maintenance one step further by using sensor data to recognize hazardous trends and alert the appropriate maintenance personnel before the issue escalates.

"Telkonet's EcoSmart platform has proven its ability to not only create an in-room energy management network to enhance energy efficiency, but also to streamline remote equipment monitoring and manage maintenance more efficiently to extend equipment life."

Steve Brandt
Strategic Account Manager
Trane Hospitality

Jerry Dallaire, owner of Custom Energy Solutions, says "Maybe a room air conditioning system isn't working correctly. The system will send an alert to hotel staff so it can be fixed while the guest is away from the room, before the problem is even recognized." These predictive maintenance systems can even help a maintenance team work more efficiently by creating maintenance schedules based on actual usage and not estimated schedules, for example battery and air filter replacements.



Source: BI Intelligence Estimates

Machine Learning

Companies like Verdigris are engineering the building blocks of tomorrow's predictive analytics platform. By using Machine Learning technology (similar to Google's Tensor Flow), Verdigris is able to identify the type of equipment that is in the network by measuring its electrical characteristics using wireless sensors at the circuit panel.

Water

Hotels are beginning to use these predictive technologies to conserve water and prevent water-related damage. The average cost of a leaky toilet in New York is approximately $2.74 per day, not including the very costly task of repairing potential water damage. By measuring usage on the water lines with low-cost water meter's, a hotel could see an ROI in less than 5 years. The saying holds true that "you can't manage what you can't measure."

3. Mobile Engagement

Our world is now witnessing the strength of the mobile revolution. Mobile platforms like iOS and Android have created an entirely new industry full of app developers and mobile advertisers. Mobile devices have transformed the way we work, commute, travel and entertain. Today, there are almost as many cell phones (6.8 billion) as people on the planet (7 billion), with over 85% of the world's population receiving cellular coverage.

The number of smartphone users has dramatically increased over the past few years, but what's more interesting is that people are spending more time on their phones than ever before. Since 2014, Americans have been spending more time on the Internet with their mobile devices than their PC's.

Telkonet's mobile room control application - EcoManage

"Offering guests a mobile app with integrations that allow them to personalize their visit will give hotel brands authority in the hospitality market. Millennial travelers not only value the convenience of sending instant requests with the touch of a button, they also build relationships with brands through their devices that convert to a great ROI."

Shawn Spartz
Director of Creative & Development
Marcus Hotels & Resorts

The Millennial Traveler

The rise of the millennial generation (adults ages 18-34) is partly responsible for this technology wave. In 2015, Millennials surpassed the previous generation, Gen X, to become the largest share of American workers, and they will represent over 50 percent of all travelers by 2025. Growing up in the technology era, Millennials are tech savvy and have especially high technical expectations for the products they use.

Hoteliers are already aware of this technological impact on their internet bandwidth. Today's hotel guest carries an average of three connected devices. Travel Industry Advisor, Henry Harteveldt, notes that "Mobile has produced a permanent sense of immediacy. It's changing forever how our guests interact with us and how they expect us to interact with them."

These challenges will not get any easier as consumer data appetites continue increasing, however, a mobile-first strategy could offer a hotel a competitive advantage. For example, 46 percent of Millennials in Australia would like to manage their loyalty / rewards apps on their mobile device, but only 16 percent are currently doing so today. There is a clear gap between what a traveler expects in mobile technology and what the industry is providing today. However, that will likely change: 84 percent of operators are planning to have hotel-branded customer loyalty apps within the next 18 months.

Mobile Check-In & Connected Door Locks

Companies like Hilton and Starwood are even offering their guests the ability to check in and unlock their doors all through their mobile apps using Bluetooth wireless communication. Using keyless entry, these brands are lowering their labor costs while increasing guest satisfaction all by saving time otherwise spent at the front desk.

Platform companies like Telkonet's EcoSmart boasts the ability for hotel brands to control the guestroom IoT products through the same guest loyalty apps that unlock the door, such as: lights, power outlets & temperature settings.

4. Hyper-Personalization

Hotel Personalization in the Future

Image a hotel experience in the future. You open your favorite hotel loyalty app and within seconds you book the room with the east-facing view and one king bed . The next day, your app gets notified that your plane landed and calls an Uber to the baggage claim, your Uber driver already knows where you're headed. Your app knows when you arrive to the hotel drop-off and sends you turn-by-turn directions straight to your room. The front desk staff welcomes you by name and asks if you need anything, but you don't. You go straight to the room, unlock the door on your mobile app via Bluetooth. Once the door opens, the lights turn on, the shades open, the TV turns on and greets you by name on the screen. The room is already heated to your favorite temperature and the same candy bar you ordered last time is waiting for you on your pillow.

Enhancing the Personal Touch

Just as industrial equipment collects and analyzes massive sets of data to improve performance of the equipment, web applications now collect and share data about a consumer's personal preferences to improve their online experience. Data sharing between website and mobile applications is typically intended to help advertisers like Google & Facebook target the right audience based on their search history. Despite the obvious privacy concerns, 78 percent of consumers expressed a desire for some kind of content personalization.

"Hotels can take it a step further and personalize the information, such as offering a special spa package to a mother and daughter pair, or offering drink specials to a group of guys on a golf weekend."

Jennifer Gregory
Journalist
Samsung Insights

This personal data can also be used to provide the "personal touch" to hotel guests to make them feel special. Personalizing a guest experience in a hotel is critical to maintaining guest loyalty. Some hotels offer personalized experiences via restaurant recommendations or welcome bags, however digital experiences provide the opportunity to provide more personalization for less money. For example, Hilton's HHonors mobile app allows a loyalty program member to select the exact room location and configuration (king bed versus two separate beds) a day before arrival.

Hyper-Personalization

By automating a personal check-in experience, the front desk doesn't get bottlenecked and the guest receives a consistent greeting every time, no matter how busy the hotel is at the time. Automation also allows the hotel to provide a personal touch that was never economically feasible until now, such as turning on the lights and heating up the room.

For example, Samsung's Hospitality Business and Telkonet's EcoSmart platform partnered to create a smart room that demonstrated a welcome scene with the lights, shades and temperature controls, along with displaying the guest's name, on the in-room TV with a welcoming message. By collecting data on a specific user's climate preferences over time, Telkonet's EcoSmart IoT platform can begin to customize the guest's preferred automated room settings just by tracking all the light switches and thermostat buttons that the guest interacted with on a previous visit.

5. Location-based Interactions

Mobile apps are increasingly aiming to provide more contextual information to the user using location data via GPS, Bluetooth or Wi-Fi. Google Maps now sends a notification to notify a person that it's almost time to leave for an appointment by collecting real-time traffic data and the appointment address from Google Calendar to help the person not be late. For contextual information to be useful, it typically needs to understand both time and location.

By nature, hotel guests often need suggestions from the hotel staff about the local area. Location-based suggestions and interactions are now going digital, making it easier to deliver more valuable information to more guests than ever before.

The Digital Front Desk

The front desk might be asked, "Where should I eat tonight?" or "How long does it take to drive to the airport from here?" By combining the data readily available on the internet and the question that the guest specifically needs answered, digital location-based interactions are now more accurate than human-based interactions. This is increasingly important given the trend toward more international travel than ever before.

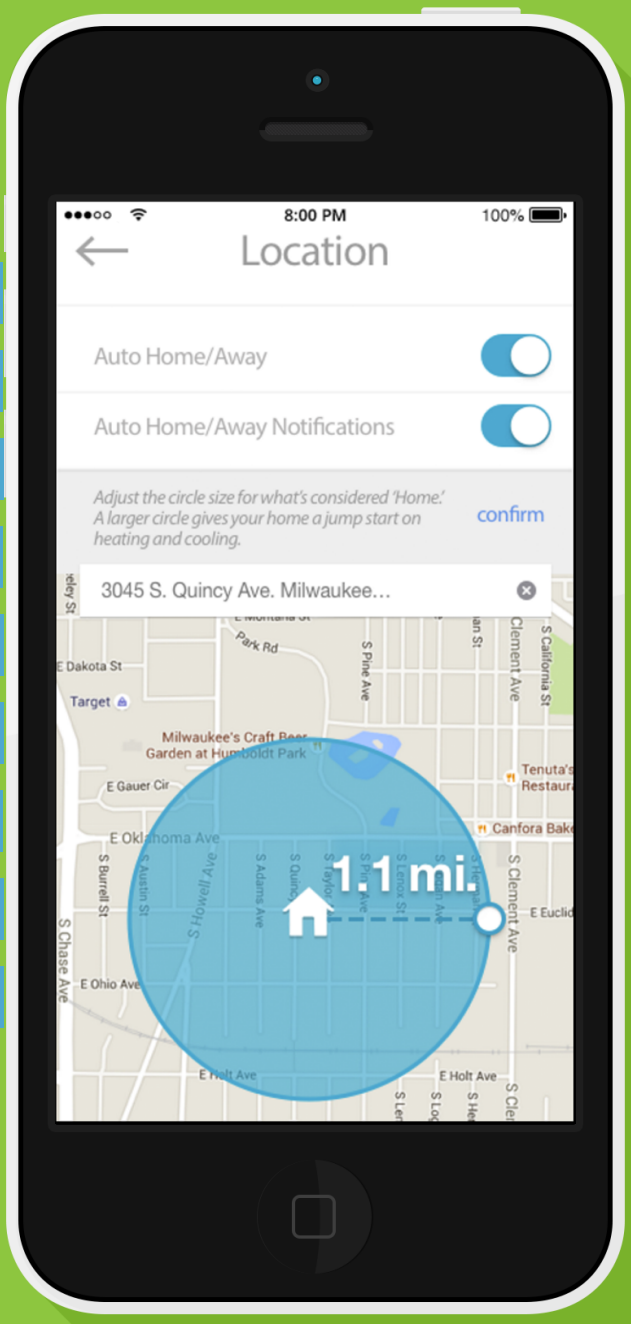
It's no wonder 30 percent of hotels in 2016 are allocating budgets for location-based technology. Hotels like the Fontainebleau Miami are using location-based data combined with PMS (Property Management Systems) data to upsell guests through pre-arrival or checkout offers, such as a late stay. Similarly, IoT platform companies like Telkonet's EcoSmart are using location-based data to more accurately detect occupancy in a guestroom in order to adjust the temperature and lights to save energy, along with notifying the housekeeping staff when and when not make up the room. In the future, hotels can expect a new revenue stream by providing location data to advertisers like Groupon and Yelp to better target hungry travelers.

Apps that use location data:

- Uber
- Facebook
- Yelp
- Groupon
- Weather Channel
- Google Maps

Top New Tech Rollouts in 2016

- 30% Location-based technology
- 27% Tablets at front desk
- 24% Mobile payment
- 23% Mobile key
- 22% Room control devices
- 21% Mobile apps for customer use
- 20% Energy management
- 16% Interative digital signage
- 16% IPTV ("Smart" TV)



% of hotels allocating capital to these projects, according to the 2016 Lodging Technology Study

6. Natural User Interfaces

Despite the tremendous value created by emerging technologies like Big Data Analytics and Machine Learning, people often resist new technology due to the effort involved in learning how it works. Often the new products only benefit those considered "tech-savvy," especially in a hotel setting where a traveler is tasked with understanding new room controls they've never encountered before, often just for one night.

User Experience Design

A new discipline is emerging in the tech sector to solve this problem, known as User Experience (UX) Design. The UX designer is tasked with making technology less intimidating and more user-friendly so that it can be embraced by more people. The idea is not only to make web and mobile apps more intuitive, but to consider the entire hotel experience and add in technology wherever it fits to make the hotel feel more like the guest's home away from home.

Zero UI

Amazon's overwhelming success of their voice-controlled assistant, Alexa, has given the world confidence that voice interaction is indeed useful. Amazon's Alexa can be even be found in non-Amazon products like the Triby refrigerator companion. In fact, Google recently stated that one in five Google searches are done by voice. This screenless computer interaction is growing in popularity among UX designers, dubbed Zero UI.

Smart TV as the Hub

Perhaps the most natural technology interface in the guestroom is through the TV. TV's are so common that almost everyone knows how to use it. Since the TV is often the focal point of the room, it could be used as a powerful tool for the guest to interact with technology in the room and even the front desk. For example, Samsung's Hotel Management Solution provides a TV remote interface to control the thermostat, lights, shades and Do Not Disturb signs, along with checking weather and flight information.

UX and Turnover Costs

Good user experience design is not just for guests, it's also important to provide clean and intuitive technology interfaces to the hotel staff in order to maximize productivity. Given the especially high turnover rate in non-management US hotel staff, as high as 50%, hotels spend too much money already in training. For example, Dallaire says that energy management systems that are operated in the cloud "allow for systems to be user-friendly and easily accessible, all beneficial things when your engineering department has a high turnover rate."

Imagine a hotel guestroom in the future where a user can simply say "Alexa, goodnight" without leaving the bed to turn off all the lights, turn off the TV, close the shades and turn down the temperature. That capability is possible today using Telkonet's EcoSmart Intelligent Automation platform.

Voice is omnipresent, natural and the future. More importantly, Voice will be how consumers connect with technology and connect with your product.

Andrew Vincent
Business Development
Amazon

7. Open Platform Integration

In order to make IoT a reality today, vendors must work together to bring these large systems online. IoT is a complex, multi-faceted technology that involves everything from hardware sensors to user interfaces. Hardware companies are necessary to obtain the sensor data and control the devices, yet platform companies are also necessary to integrate the entire IoT ecosystem and provide actionable insight through the analysis of massive data sets.

Hardware Standardization

Being a nascent technology, IoT still lacks clear standards overall. Despite this, various industries have begun converging on technology decisions. For example, the residential IoT market is slowly replacing Z-Wave with Wi-Fi & Zigbee due to the ubiquity of Wi-Fi in residential homes. Municipalities like the Netherlands are beginning to adopt LoRaWAN in their smart city initiatives due to its long-range communication capabilities. Similarly, the hospitality industry appears to have standardized on Zigbee due to the long-range and low-power advantages, and because it doesn't interfere with the Wi-Fi bandwidth reserved for guests.

"Companies that win in the future will be the ones that are hardware brand agnostic and act as a bridge to make all networked devices communicate together more seamlessly."

John Stiene
VP Innovation & Energy Services
Carrier Enterprise

System Integration

As the IoT market matures, vendor consolidation will likely occur, creating a smaller amount of vendors with more cohesive system offerings. Until then, integration will provide work for many. API's for example, Application Programming Interfaces allow sensors, systems or platforms to securely communicate with one another. By allowing applications to communicate with one another via API in the cloud, third-party integration is typically quicker. However running control data through the cloud has its disadvantages as well, communication lag for example, creating opportunity for more tightly-integrated offline systems.

Future of the API

Today, third-party API's make sense considering the large number of players in the market. As the market consolidates, building management systems & energy management systems will likely be indistinguishable, and building managers will be thankful for having one less dashboard to manage. Moving forward, the consolidation of commercial IoT vendors will cause the API to be more important for consumer-facing applications and less important for the tightly-integrated on-premise building system applications. For example, Loews Hotels offers the ability to reserve a room using a Twitter hashtag using Twitter's cloud-hosted API.

Open Architecture

Right now, it's a safe bet to err on the side of openness to contribute more value to the larger, multi-faceted IoT systems. John Stiene, VP Innovation & Energy Services at Carrier Enterprise, says "Companies that win in the future will be the ones that are hardware brand agnostic and act as a bridge to make all networked devices communicate together more seamlessly."

Conclusion

As with most industries, hospitality is just beginning to explore all of the value potential offered by the Internet of Things. Some hotels will embrace this technology to differentiate, while others will undoubtedly resist. Those who understand the impact of this technological revolution will be best positioned to leverage new opportunities.

But at the end of the day, the Internet of Things is just another tool to help hotels and resorts satisfy their customers. Even though we are confident that the Internet of Things will level the playing field and shake up the industry, there will of course be many other ways to remain competitive. Even after this technology wave hits, people will still need to travel and they will still value superior comfort and customer service. As always, a customer focus will always make good business sense.

About Telkonet

Telkonet is a leading provider of intelligent automation solutions throughout commercial markets worldwide. The Internet of Things offer considerable energy cost reductions, staff productivity enhancements and carbon footprint reductions through intelligent networked communications, improved asset utilization and data analytics. Telkonet's EcoSmart platform and products, along with the EcoCentral management dashboard, reduce energy consumption, HVAC runtime and utility costs in most commercial building environments.