December 2019

Travel beyond 2020
Robots in travel

Key themes

- **Robots can help deliver a personalized experience to travelers.**
- **While travelers are happy to use automated technology, they're less sure about interacting with robots.**
- **Deploying robot services in airports and hotels improves customer service and lowers costs.**
- **Travelers must learn how to interact with robots to get the best from them.**
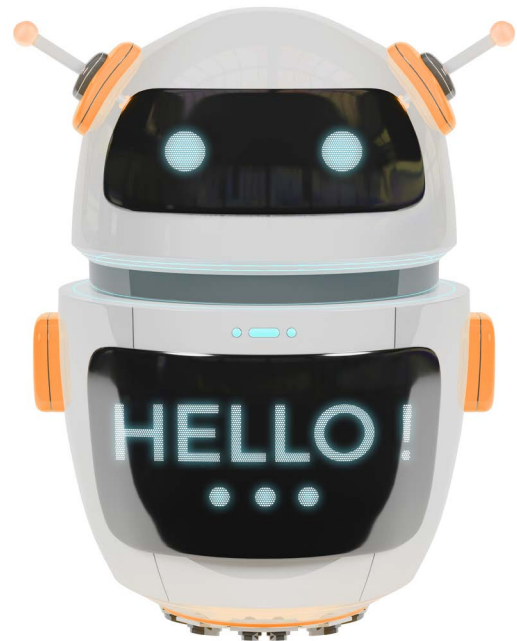
Travelers interact with robotic devices on almost a daily basis, perhaps without realizing. With 60% of U.S. travelers already using voice-enabled digital assistants, like Alexa, to access travel information, chatbots are a well-established robotic feature of the travel industry.[1] Chatbots offer personalized services while saving time and money. While they can automate many routine tasks, they can't handle every request. Human intervention is still needed, particularly for physical tasks.

Like chatbots, robots can be configured to offer travelers personalized experiences, but they can also perform time- and cost-saving tasks in the real, rather than virtual world.

Studies suggest robots may not necessarily be the innovation most travelers hope for. They're of more appeal to airports, airlines and hoteliers for the cost savings they offer by performing tasks more efficiently than human-based systems. Travelers will need to get used to them, learn how to interact with them and appreciate the benefits they offer. They may have no choice, especially if robots replace humans for some tasks.
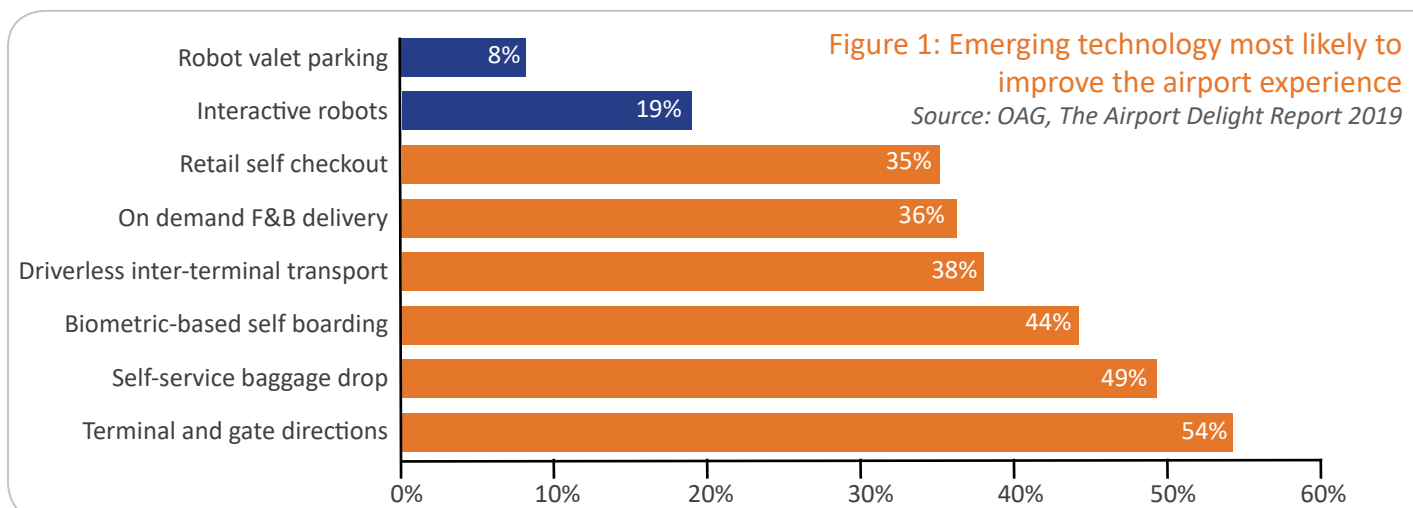
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What do consumers want?

Consumers want more personalized experiences across all stages of their journey. When staying in a hotel, they're looking for recommendations and in-room amenities curated to their specific needs.[2] Robots are ideally suited to provide information and assistance, but travelers still need to be convinced. More than half of respondents (56%) to a YouGov survey for hotel operations platform ALICE did not want to encounter a robot during a hotel stay.

Air passengers may not quite be ready for robots either. Overall, the 2,000 travelers OAG surveyed for its 2019 "*The Airport Delight Report: Humans vs machines*" turned out to be more skeptical than expected about emerging technologies.

Passengers aren't that interested in interactive robots that can answer travel questions and provide concierge services; and they're even less interested in using robots to park their cars. Both options rank low among the emerging technologies considered most likely to improve efficiency and the customer experience when using an airport (Figure 1).

Figure 1: Emerging technology most likely to improve the airport experience
Source: OAG, The Airport Delight Report 2019

Technology	Percentage
Robot valet parking	8%
Interactive robots	19%
Retail self checkout	35%
On demand F&B delivery	36%
Driverless inter-terminal transport	38%
Biometric-based self boarding	44%
Self-service baggage drop	49%
Terminal and gate directions	54%

[2]*Phocuswire, Apr. 24, 2019*

This need not be the end of the road for airport-based robots. Based on their top responses to the OAG survey, travelers are clearly comfortable interacting with automated or self-service technologies. OAG found travelers are most interested in emerging technologies that provide step-by-step directions to help navigate airport terminals and find departure gates. Robots can and already do solve this problem in some airports.

By adopting new automation technologies, airports and hoteliers can reduce costs and improve the customer experience.[3] Some consumers will still crave some form of physical interaction, even if it comes in the shape of a robot concierge. With millennials 60% more interested than the general population in mobile robots autonomously parking their cars,[4] the underlying acceptance of robots is clearly much stronger in some age groups. Attitudes will change as the millennial share of the workforce increases and interactive robotic technologies continue to evolve. It may be only a matter of time before robots become a common feature in travel.
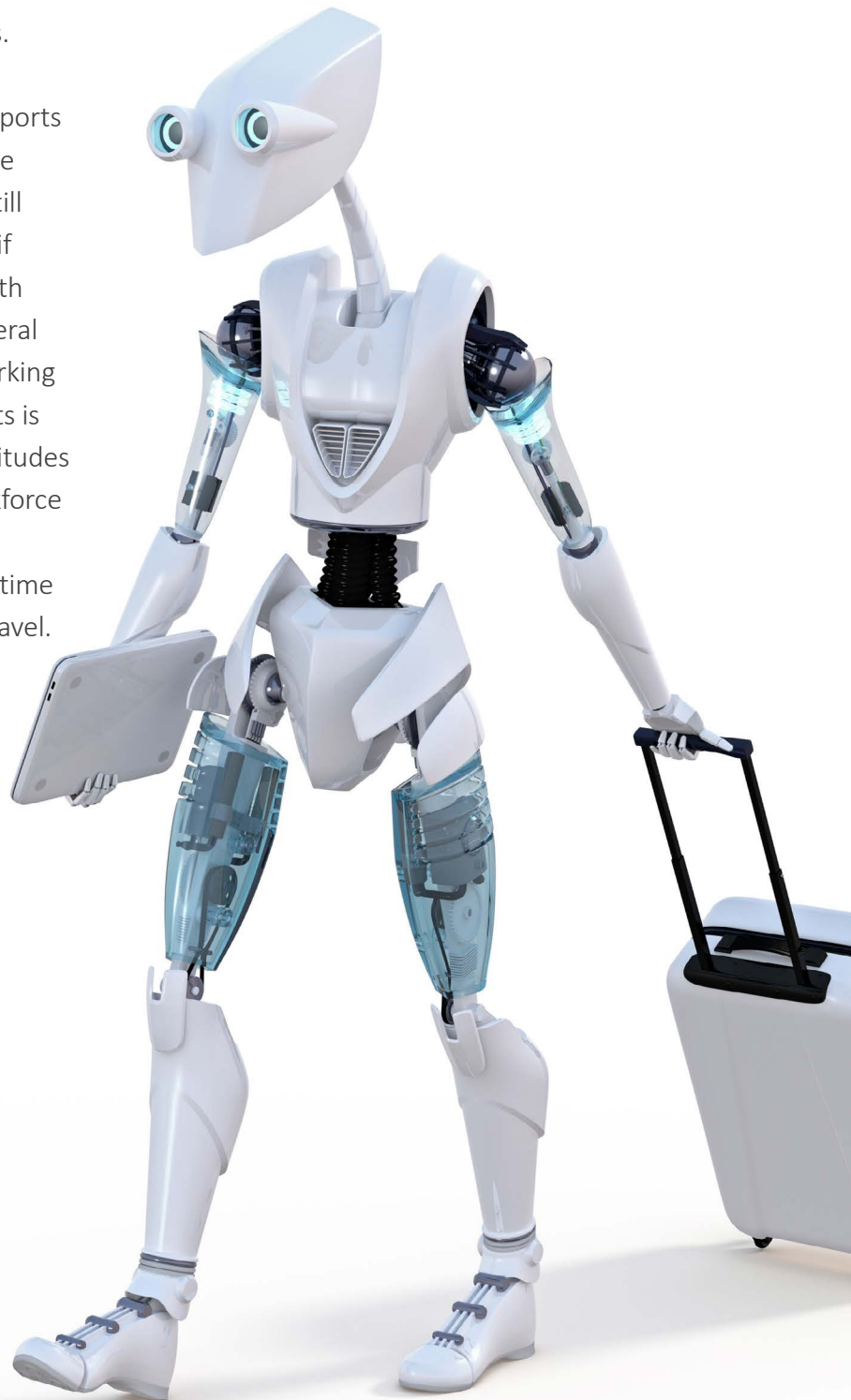
[3]Phocuswire, Jan. 25, 2019
[4]OAG, The Airport Delight Report 2019

Robots turn on the charm

For robots to be a success, they must get their interaction with travelers right. A number of airports have been conducting robot trials to assess customer reaction and learn how best the robots should interact with them.

In 2016, Glasgow Airport introduced GLAdys—the U.K.'s first humanoid robotic airport ambassador.

GLAdys is part of the airport's Digital Passenger Experience Project, which explores how customer engagement and communication can be further enhanced through the use of digital technology. It was initially programmed to entertain passengers of all ages as they passed through the airport.

GLAdys's capabilities were initially limited to singing Christmas songs, telling festive tales and posing for selfies with travelers.
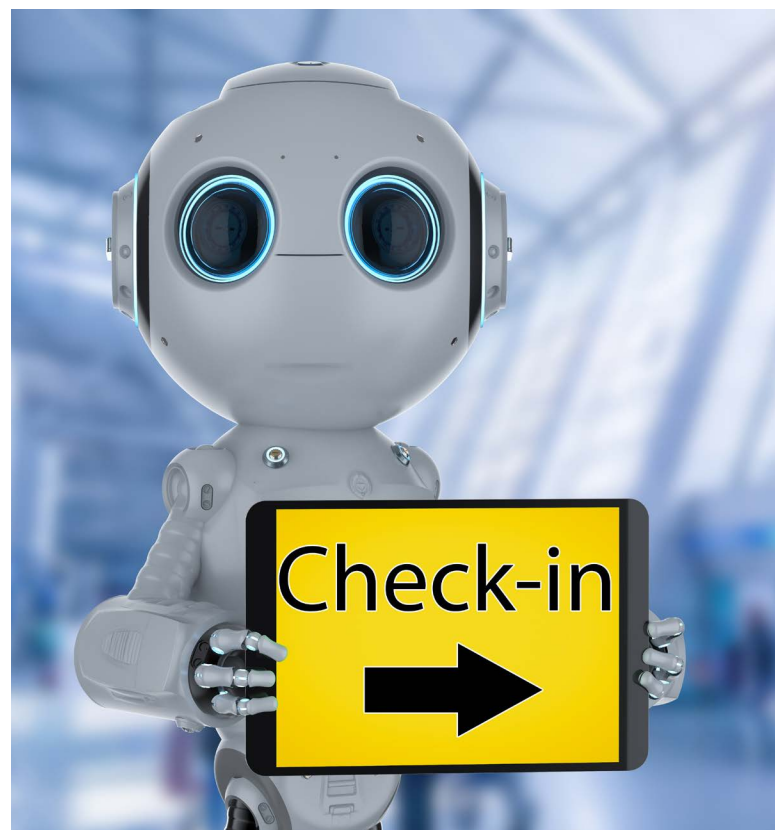
[15]Streetsblog USA, Oct. 8, 2019

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Robots in action—
at the airport

Robots are becoming a more common sight in airport terminals, as the technology is adopted to engage with customers and optimize efficiency.[5] Thanks to artificial intelligence and machine learning, many robots are able to learn and expand their knowledge. They'll be able to provide passengers with more relevant information and deliver more operational benefits to airport operators and airlines.

Asia leads the way

Asia's airports and airlines have actively embraced robot technology to help improve the passenger experience and optimize efficiency.

Japan Airport Terminal Co. Ltd launched Haneda Robotics Lab in 2016 to give robot developers the chance to test and familiarize passengers with robots in the airport environment.[6] It's particularly interested in robots specializing in three fields: security, logistics/transportation and translation. Robots on trial include Reborg-X, an autonomous patrolling/guiding robot, and Relay, an autonomous delivery robot transporting goods between locations.

LG's Airstar robot is already a familiar sight at Incheon Airport in Seoul, South Korea. Powered by artificial intelligence and voice recognition technology, Airstar is multilingual. Based on a passenger's flight number, Airstar provides onscreen information and directions to points of interest in the airport. It can also guide passengers to check-in.

Airlines are developing robot assistants, too. In May 2018, Indian full-service airline Vistara unveiled RADA, the first passenger-facing robot to operate in an Indian airport.
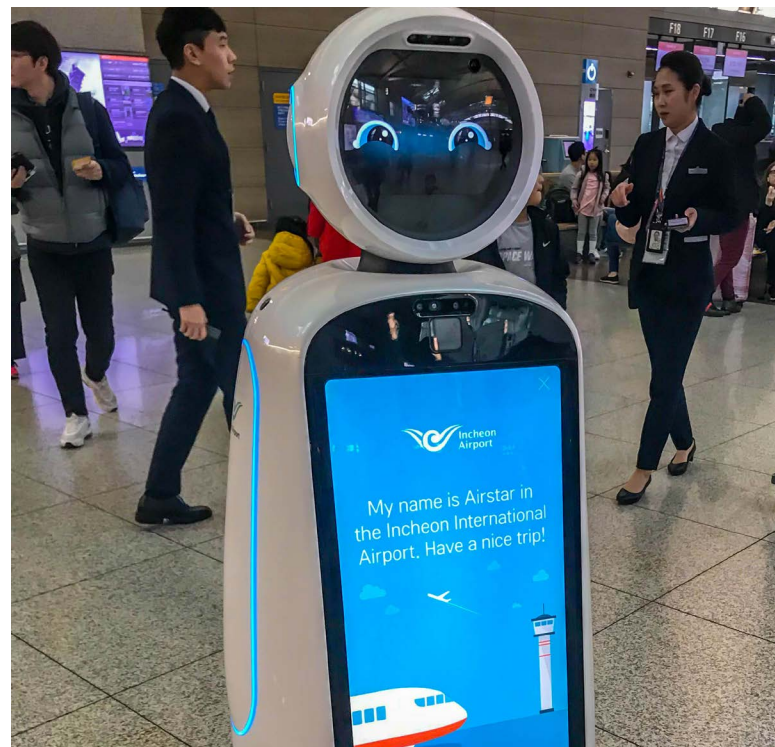
(Photo by Shanae Ennis-Melhado/Shutterstock.com)

[5]Future Travel Experience, *Jan. 2019*
[6]Future Travel Experience, *Oct. 2018*

Operating in Vistara's Signature Lounge in Delhi Airport's Terminal 3, RADA provides information on the terminal facilities, departure gates, destination weather conditions, real-time flight status and information about the airline's products and services.

RADA's humanlike behaviors are presently limited to basic hand movements and moving around the lounge on predefined pathways. It can also keep younger travelers entertained by playing games, songs and videos. RADA is intended to enhance the customer experience, gradually taking over routine, mundane tasks. It's a basic platform with basic functions which can be further developed to handle more complex tasks.

Europe aims for humanity

European airports are also trialing and developing concierge robots, with an emphasis on making interactions as human as possible.

KLM has been testing its concierge robot Spencer at Amsterdam Schiphol Airport since the end of 2015.[7] After scanning passenger boarding passes, it can guide them to their departure gate. Spencer is able to deal with social situations between people and can "see" and analyze people nearby with its sensors. By learning and complying with social rules, Spencer will ultimately act in a human-friendly way.

In 2018, Munich Airport teamed up with Lufthansa to trial Josie Pepper, a humanoid robot developed by SoftBank Robotics.[8]

Josie Pepper provides information, directing people to their departure gate and answering questions about restaurants and shops. It uses IBM Watson Internet of Things (IoT) cloud-based artificial intelligence. It can link to a cloud service where speech is processed, interpreted and linked to airport data. This enables Josie Pepper to answer each question individually, rather than rely on a set of default responses. Its ability to learn ensures its replies will become more precise over time.

In 2018, Prague's Vaclav Havel Airport introduced its customers to Master Pepper, a relative of Josie Pepper offering directions and entertainment.[9] As well as showing the way to departure gates, children's play areas or the nearest information desk, Master Pepper also takes selfies with passengers and dances on request. Developer SoftBank has sold more than 12,000 Pepper model robots since 2014.

More than a concierge

In the airport setting, robots are largely seen as a way to enhance the customer experience by offering information and guidance. Airports benefit from a more efficient throughput of passengers, not just to the departure gates, but also to retail outlets and restaurants. Robots have more to offer than these concierge services.

At Geneva Airport, a robot called Leo has been helping departing passengers with their bags.[10] Developed by SITA and Bluebotics, Leo is a fully autonomous, self-propelled baggage robot that can check in bags, print bag tags and transport and load up to two suitcases onto the correct flight. Leo is equipped with obstacle avoidance and can navigate an airport's high-traffic environment.

Once a passenger has loaded their bags with tags attached, Leo takes them directly to the baggage handling area, reducing the number of bags in the airport terminal. Geneva Airport is using Leo to provide insights into the potential use of robots across the passenger journey of the future.

Rotterdam The Hague Airport has also tested autonomous baggage handling robots.[11] Its robots operate behind the scenes, handling passengers' bags once deposited at check-in. The airport wants to see if robots can deliver baggage more quickly than current machine-sorted methods. Passengers should also benefit from fewer lost bags.

London Gatwick Airport has trialed autonomous robotic car parking valets in an attempt to fit more vehicles in its long-stay car park.[12] Once a car has arrived at the car park and been checked in on a touchscreen, Stan, a forklift truck-like robot, takes over, raising cars off the ground and transporting them to a parking space. The cars have their dimensions scanned to ensure they're slotted in an appropriately sized space. As there's no need to open car doors once parked, valet parking robots help increase car park capacity by one third. Easier parking for travelers and more revenue for airports.

Paris Charles de Gaulle, Lyon and Düsseldorf airports have tested similar systems.
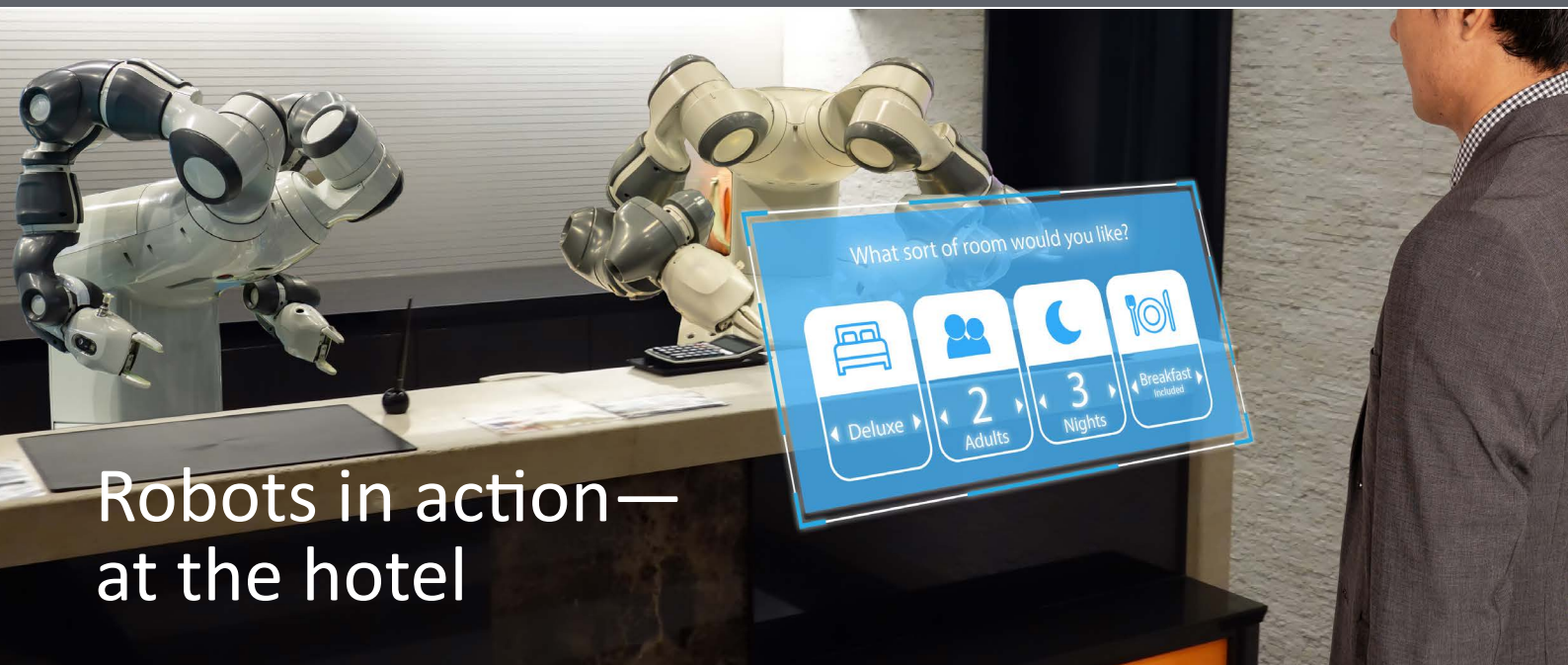
[7]*Future Travel Experience, Apr. 2016*
[8]*Future Travel Experience, Feb. 2018*
[9]*TravelPulse, Oct. 29, 2018*
[10]*Future Travel Experience, May 2016*
[11]*TravelPulse, Nov. 6, 2018*
[12]*Autoexpress, Jan. 24, 2019*

Robots in action— at the hotel

The days of human-based customer service in hotels could be numbered thanks to the introduction of robots.

Robots widely deployed

In some markets, robots are already widely used. Robots produced by Beijing-based Yunji Technology have been deployed in more than 500 hotels across China.13 They escort guests to their rooms, deliver room service and provide concierge assistance. Its robots are also being used in hotels in Japan, South Korea, Singapore, Thailand, Saudi Arabia and North America. Chinese travel services company Ctrip has now invested in Yunji and will work with it to "promote smart service applications in the hospitality industry."

Also in China, Alibaba-owned travel platform Fliggy has opened a hotel specifically to use technology to refine the guest experience.14 Guests staying at the FlyZoo Hotel in Hangzhou can book and select rooms via a mobile app. They can check in using the app or a self-service kiosk and use facial recognition to access elevators and their rooms. Room-service robots deliver food to rooms and restaurant tables.
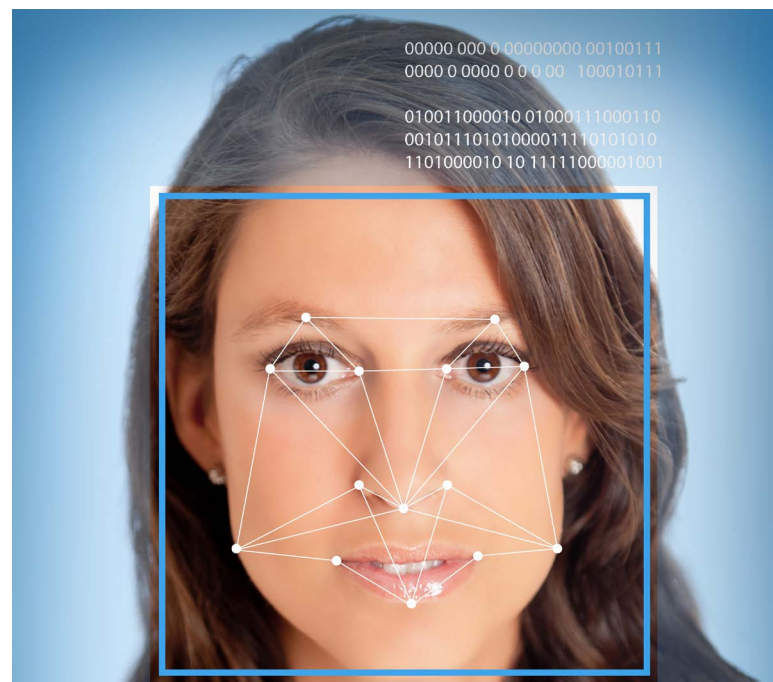
13Phocuswire, Jan. 10, 2019
14Phocuswire, Mar. 13, 2019

Robots in travel

Japanese company HIS Group has even launched a chain of hotels staffed by robots. In 2015, it opened its first Henn-na Hotel property in Nagasaki's Huis Ten Bosch theme park. It has since opened nine more robotic hotels, including seven in Tokyo. HIS Group introduced the robots to deal with staff shortages in Japan's hospitality sector.

Guests can be checked in by a multilingual dinosaur robot or a humanoid reception bot. Hotel rooms are unlocked using facial recognition technology. Inside each room bedside bots provide guest assistance.

While Henn-na Hotels has demonstrated the potential robots offer, it's also exposed areas for improvement. HIS Group has admitted that hackers can use the cameras and microphones in its in-room Tapia robots to spy on guests.[15] There have also been problems with voice recognition systems reacting to guests snoring and reception dinosaurs failing to understand the names of guests. In January 2019, the hotel even "fired" half of its 243-robotic staff in its Nagasaki hotel after finding they created more work than they reduced.[16] Human staff spent time repairing the robots and doing the jobs they were introduced to do.

Robots on the charm offensive

Despite some early teething problems, the hotel robot charm offensive continues. In 2018, Vdara Hotel & Spa in Las Vegas unveiled two robots—Fetch and Jett—robotic dogs delivering snacks and sundries direct to guests' rooms. Chicago's Hotel EMC2 has introduced Cleo and Leo, two robots catering to guests who might need assistance. They can bring an extra towel or bottle of water to rooms and deliver room service ordered by phone call or text message.[17]

Savioke, a San Jose, California-based robot developer, has developed Relay, a robot able to take on monotonous, time-consuming delivery tasks from hotel staff, freeing them up to spend more time with guests.[18] Larger hotels often deploy multiple robots. Hotels can generate extra revenue by charging a delivery fee for things they might not have delivered before—coffee and snacks—as guests are enticed by the novelty experience of robotic delivery.

Aloft Cupertino was Savioke's first hotel. Botir a three-foot tall robot has been looking after guests since 2015. It's limited to answering guest questions, but this can be helpful when the reception desk is busy and all a guest wants is something simple, like an extra towel.

(Photo by Ned Snowman/Shutterstock.com)

[15]Newsweek, Oct. 23, 2019
[16]Hotel Management, Jan. 31, 2019
[17]TechPulse, Dec. 14, 2018

More than a gimmick

Robots don't just provide room service. Miso Robotics has developed Flippy, which flips hamburgers, while Tipsy mixes cocktails in Las Vegas. At first sight, these look like gimmicks, but robots like these offer a unique selling point for the hotels that deploy them.

And there's a clear economic rationale for increasing robot use: cost savings. According to the Economist Intelligence Unit, while labor costs have more than doubled since 1990, robot prices have nearly halved.[18] Minimum wages are increasing costs; robots rarely take sick leave or vacations; and they can work 24/7. As artificial intelligence boosts their capabilities and people get used to them, robots will offer a personal touch across a range of functions previously performed by hotel staff.
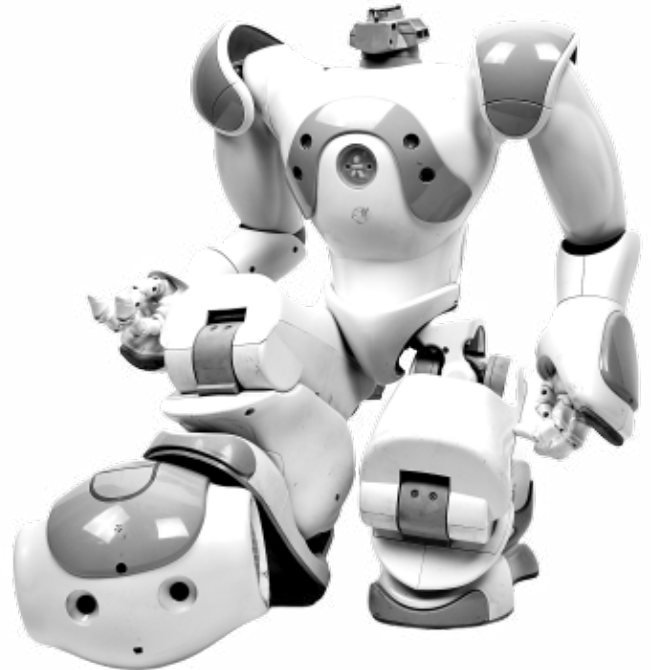
Do you have questions or comments regarding this report? Please email Mike Eggleton to share your thoughts.

Mike Eggleton
Director
Research and Intelligence

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[18]*The Telegraph, Oct. 19, 2018*