OTIS

IFMA Panel Discussion

WHITE PAPER

Leveraging IoT
to Improve Building Operations
and Passenger Perceptions

IFMA's World Workplace®
Your Facility Conference & Expo
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| Phoenix Convention Center

The Internet of Things (IoT) has the potential both to streamline building operations and improve the customer and passenger experience. To explore these possibilities, Otis convened a special, high-level discussion panel in October 2019, at the International Facility Management Association (IFMA) annual conference in Phoenix, Arizona.

The following document introduces the panel of global industry experts and presents a lightly edited transcript of their discussions. In summary, they raised the following points:

Intelligent people movement requires integration

- Increasingly, elevator data will need to be integrated with building systems and other technologies, like cleaning and delivery robots, and even the wider public transport ecosystem. As facial recognition technology develops, an elevator could be dispatched to meet an occupant seen arriving in the car park. Data vigilance is key.

- Elevators can be positioned for better passenger service by linking to occupants' meetings and events calendars, weather information and the public holiday schedule, and drawing on historical building-specific data as well. This also enables energy saving and less disruptive maintenance. Again, data security remains vital.

- In the hotdesking world, elevator systems could be linked to occupancy data to manage where people sit and allow whole floors to be closed off and brought back into use to save energy. Elevators could also encourage people to take the stairs for short trips (for health and energy saving).

The elevator experience can be linked to the workplace experience

- Large in-car displays that share information or entertainment benefit passengers and occupants. A chatbot could allow passengers to talk to the elevator (all the better if it's a more fun and social experience), while more intelligence and automation could help in an emergency.

- Occupants may be willing to pay for a service in which the elevator would alert a meeting organizer that their guest was on their way up. They may also want to have engaging in-car content that reinforces their relationship with business visitors.

- Elevators-as-a-Service—where the building owner or occupier pays a monthly fee and avoids capital, maintenance and modernization costs—should be considered.

Overcoming pain points makes a dramatic difference

- If a person's first four touchpoints with an organization are positive (the parking garage, security guard, security processes and elevator, for example) they will respond more positively later. The aim must be to remove friction from all points in the journey.
- Ensuring that people don't lose their mobile network connection in the elevator is vital.
- People are intolerant of waiting times and having their ride making too many stops.
- Existing elevators can be given IoT functionality by upgrading the microprocessor. Where this is not possible (due to the age of the elevator or because the microprocessor does not allow it), a parallel system can be installed to capture critical data on usage and doors; areas that cause most problems.

Panelists

Peter Ankerstjerne

Senior Vice President at WeWork, EMEA, Head of Facility Management and Workplace Experience

- Peter has spent most of his career with the ISS Group, where he led the development of the Integrated Facility Services concept from idea to implementation and, from 2008 to 2018, held the position of Chief Marketing Officer.

  He is a Fellow of the Royal Institution of Chartered Surveyors (FRICS) and Fellow of the International Facility Management Association (IFMA) where he serves as 1st Vice Chair of the Board.

Skender Rugova

Senior Managing Director, C&W Global Occupier Services Integrated Facilities Management

- Skender oversees a portfolio of 28 accounts and more than a thousand team members, dispersed over more than 136 million square feet in North America and internationally.

  Over his 21+ year career in commercial and corporate real estate, Skender has supported national and international clients in multiple integrated facilities management, asset and property management, transaction and portfolio management, project and construction management, capital and life cycle planning contexts.

Matt Dawson

Global Operations Leader, EY Real Estate Services Group

- Joseph (Matt) Dawson is an EY Director who leads, with his functional managers, lease administration, business enablement technologies, reporting, compliance and operations support relating to a 220 million square foot portfolio, serving 300,000 professionals with 750 locations in 154 countries. Prior to EY, he spent 16 years with the law firm Alston & Bird.

  Matt has served as chairman of the IFMA board of directors and is a founding director of Global FM, a global alliance of FM associations. He is recognized as an industry leader with significant roles in not-for-profit professional organizations and academic conferences.

Christopher Smith

Vice President, Marketing and Product Strategy, Otis

- Chris leads the global marketing organization at Otis, which includes the new construction, service and modernization product portfolio. He and his team are responsible for transforming how Otis improves the customer journey in the digital age. Since 2016, he has also been working on the development of Otis' IoT strategy with the company's engineering and information technology functions.

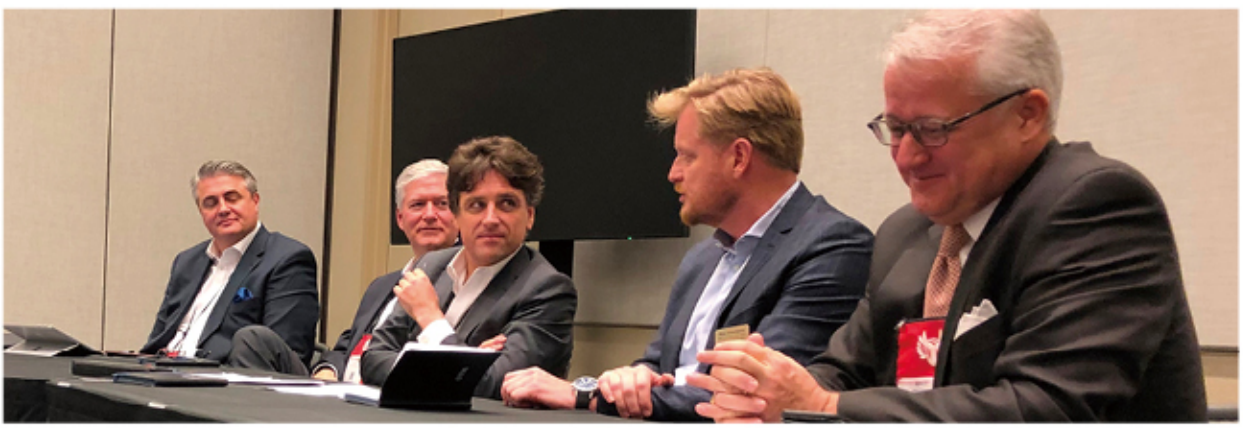
  Chris has spent 27 years in the building service industry, beginning as a maintenance supervisor for Otis in Chicago. He has since held roles in field operations, sales, general management, product marketing and digital business. Previous positions include a spell working in the fire protection and security industry and four years working for Schindler Elevator in the US and subsequently at Schindler Group HQ in Ebikon, Switzerland.

Federico Garcia Parra

Head of Global Strategic Accounts, Otis

- Federico has a solid track record in international business development and marketing that stretches back more than two decades. As Head of Global Strategic Accounts for Otis, he is responsible for the company's relationships with its strategic global customers.

  A member of the IFMA World Workplace 2020 Program Committee, Federico has also served as visiting lecturer in marketing for bachelor and MBA students in several academic institutions in Spain and North America since 2013. Federico is also an active conference and summit speaker in branding and marketing.



Section 1 Disruption

Governing question from **Garcia Parra:** Since technology is impacting the building industry as never before, what do panelists see as the disrupters or disruptive forces that will impact our organizations?

- **Ankerstjerne** says the disruption within the built environment is centered around three key topics: technology, sustainability/climate change, and new ways of working.

  As regards technology, buildings are becoming 'smart', with an increased need for connectivity and integration. The whole idea is to make people movement intelligent, which includes integrated workplace management systems (IWMS) and building information modelling (BIM). We need to optimize base elevator and escalator availability at peak periods and make elevators intelligent enough to predict need. Plus, we need to connect elevators to other technologies to ensure that, say, cleaning robots can automatically use the elevators to move around the building.

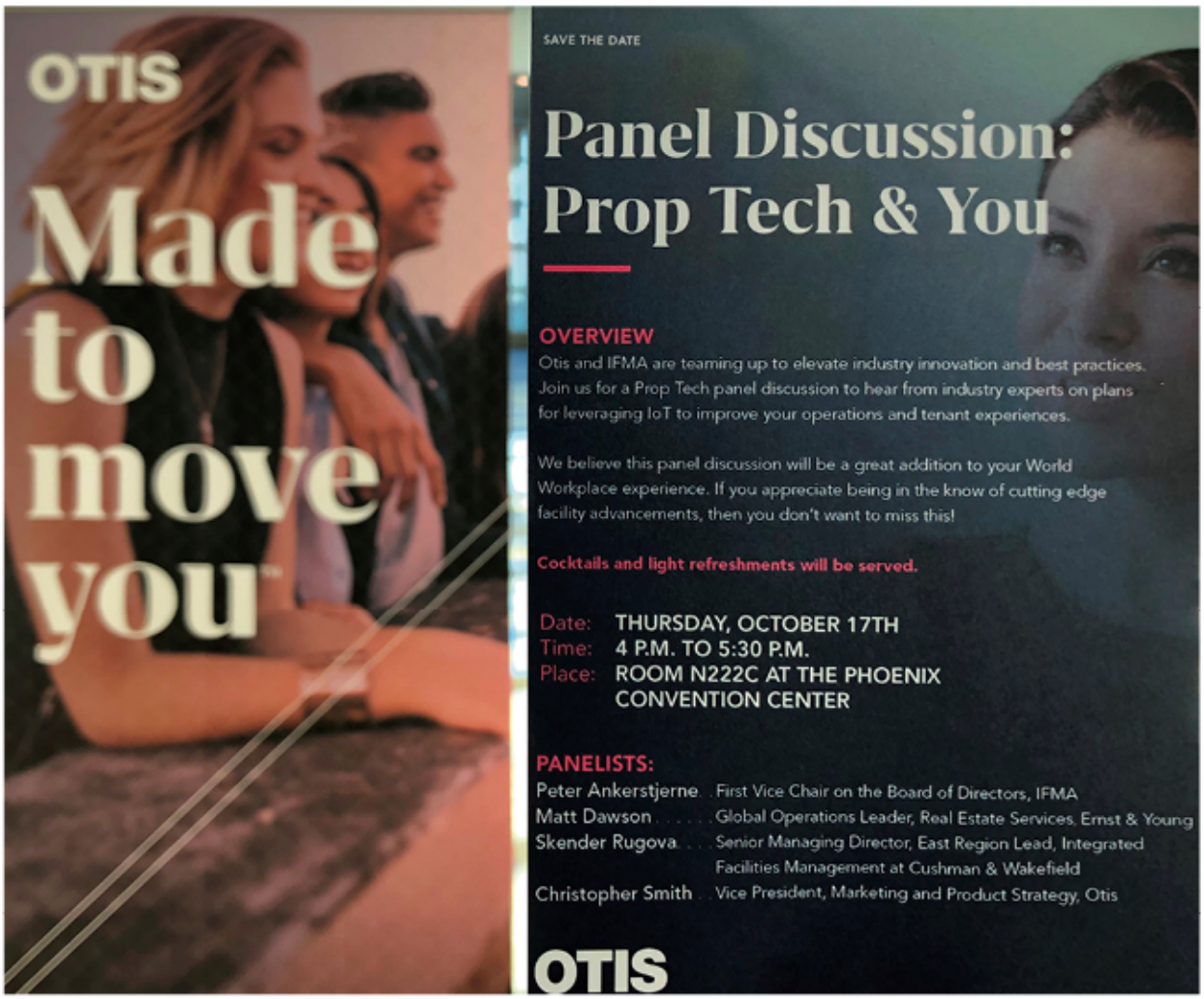
  When it comes to sustainability and climate change, and the increased focus on the environment, elevator manufacturers need to build sustainability and resilience into their solutions such as making production more sustainable and ensuring that elevators can withstand climate changes (such as flooding and other extreme weather events). We should also be taking responsibility for overall people movement—including nudging them to take the stairs as a healthy alternative to taking the elevator to help them stay in shape!

  When it comes to new ways of working, people are becoming more mobile and agile in the way they work and this, too, should be incorporated in the way we use elevators. Elevators will have sensors to predict when people need to use them, so passengers won't have to wait as long. More broadly, we should be linking the elevator experience directly to the experience of the workplace (via video, music, entertainment, and so forth). We might use elevators as a means of communication to inform people about events and initiatives in the workplace, acting almost as their virtual assistant.

- **Smith** concurs, saying that significant insights about building operations are currently locked up within most elevator systems.

  We can help building managers and owners better manage their properties just with the existing data that comes off an elevator. But when we combine this information with the other building systems, it could have a powerful impact on the quality of service for building occupants.

  Then we can take this data to a city-wide ecosystem. Can we now create a seamless experience by combining train, bus and subway data to make sure elevators are waiting for those getting off the public transportation systems to get to work? By sharing the data, the benefits could be significant.



Section 2 Connectivity

Governing question from **Garcia Parra**: With buildings becoming ever more connected, what can elevator manufacturers do to better integrate into smart building ecosystems?

- **Ankerstjerne** reiterated his point that it is important not only to be integrated with other IWMS and BIM systems, but also to be connected (via internet, phone and so on) when using the elevators. We need to make elevators intelligent and to monitor their usage and maintenance profile online to become proactive in maintenance and repair planning. For one thing, that would enable us to do maintenance outside office hours.

- **Smith** elaborated. By sharing email calendar information, we can position elevators to get occupants back to their work locations faster after a large meeting.

We also know that the weather has a big impact on what occupants do for lunch. So, by combining weather patterns with historical patterns of building use we can improve service.

On sunny days and Fridays, people tend to be out of the building for lunch, so service to the lobby is critical and we can anticipate this. On the Friday before a major holiday, we know that fewer people will be in the building and more will leave earlier than usual, so we can set down some elevators to save on energy costs.

Section 3 Cybersecurity

Governing question from **Garcia Parra:** What kinds of needs does the panel anticipate in the area of cyber security and data privacy and what will you be expecting from the different trades in that area?

- **Rugova** believes it is important for building owners and managers to be able to extract data from their in-house systems and analyze it without having to open up those systems to external access. To harness the value of their data, C&W clients can pool it into data lakes, conduct full analytics, create dashboards, and use data visualization to enhance decision making. The greatest challenge is navigating personal information.

- **Dawson** concurs, saying that sensitivities surrounding data vary by industry type. In EY's world, he would consult two different divisions, Information Security and Data Security, along with in-house IT, for their collective guidance on achieving objectives for any project in this area. One solution might be to have a virtual network that is totally separate from the in-house network, with an exchange of information that only allows certain systems to access it.

  A range of trustworthy, reliable and robust systems, including blockchain, are part of this disruptive new universe, but data protection regulations such as GDPR (which mandates heavy fines for infractions of the rules) mean that companies should consult legal counsel as well as IT, Data Security and Information Security, ideally at the idea/planning stage rather than once the product is finished. Most individuals within those functions will try to find a way to help the project lead.

- **Smith** commented on the global elevator industry's significant levels of investment in cyber security operations. Some 'intelligent' functionality—such as the system's ability to recognize a neurosurgeon, say, entering the hospital and call an elevator to the lobby to meet them—will, however, entail cloud computing, with attendant security issues.

  While acknowledging the drive to reduce cost via remote maintenance and remote interventions (such as to free trapped passengers), **Smith** reminded the panel that elevator companies cannot rely on the cloud alone, but have to have access to the in-house system. Vigilance over data will remain key.

Section 4 Customer/Passenger Experience

Governing questions:
How will passengers interact with elevators in the building of the future?

What do building managers want to see from manufacturers?

How does understanding movement data affect corporations?

How do facility managers see traffic flow changing today and in the future?

What changes will be needed to address the needs of Generation Z occupants?

- **Ankerstjerne**: WeWork starts from the premise that it should be fun to work. Work is becoming more agile…more fluid. Gen Zs are coming in at different hours, working differently to barista coffee, beer and loud music – all of which were unthinkable 10 years ago.

  Elevators have a key role to play in creating smart buildings, responding to complex occupancy patterns and decreasing carbon footprint. But buildings are still largely underutilized: so how can we connect the intelligence of the building with the elevators and the occupancy studies WeWork is conducting?

  With hotdesking, could smartly deployed elevators enable us to close off whole floors because people do not need to sit in them? As more people come in, can we use IoT intelligence to extract data and use it in real time, so that elevators automatically stop on those floors as they are being brought back into use?

  In other words, managers might seek real-time automation which would be used to make changes and nudge people to do the right thing, at the right time with just the right amount of energy use—and no wastage from sending elevators on errands to empty floors.

  The passenger/customer experience needs to be seamless with better flows and no long waits or queues on floors for elevators. Elevators are an area of improvement for WeWork, with satisfaction surveys reflecting that people have to wait too long or ride via too many stops. This is a critical area to fix.

- **Garcia Parra** echoed Gen Z's intolerance of waiting times and their need to get information faster via internet interactions and various devices.

- **Ankerstjerne** quoted the UK's Leesman Index in saying that the needs of the new generations entering the workplace were not fundamentally different than their predecessors, but that younger people were far more vocal.

- **Rugova** also sees positive Gen Z experiences as a potential driver of productivity: the happier people are, the more they will like being at work and the more productive they will become.

  Building owners and investors—rather than elevator manufacturers—could make one of the biggest improvements by putting connectivity into elevators so that passengers can ride without losing their mobile network connection.

  While this might seem like a minor improvement, it affects life balance and alleviates stress. **Rugova** avoids, for instance, scheduling any late calls where he might be in an elevator because of the potential delay to getting home to family.

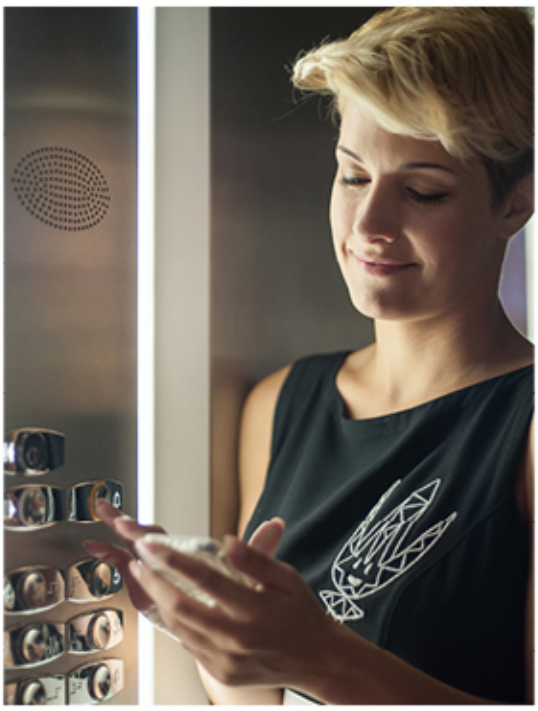
- **Smith** thinks the obvious opportunity to modernize elevators becomes more technically complex due to the need to cater for different mobile phone companies' requirements.

  For EY, **Dawson** cited the massive leaps in service quality that have been recognized or inspired by schemes such as the Malcolm Baldrige Award.

  Hotel groups such as Cappella and Ritz-Carlton used to allocate two minutes for a guest check-in. This is now done in seconds—even for a well-heeled clientele.

EY is trying to remove friction from the lives of its professionals and the lesson from surveys is that if a person's first four touch-points in an organization are positive—whether it is with a real person, a device or an elevator—then they will respond more positively to other questions in any survey.

Conversely, if they have had negative journey experiences—i.e., from interactions with parking, public transport, elevator, security guard or security system (which building managers can correct)—it will shift the needle in terms of user experience. Removing the friction from all the points of the journey into the space is the lens through which EY sees passenger experience.



Section 5 Organizational Behavior And Change

Governing question:
How do facility managers see artificial intelligence or robotics changing?

- **Rugova** thinks AI and robotics will have a significant impact on certain professions, such as portfolio administration, lease administration, call centers, help desks and similar activities which can be automated. Elevators are likely to evolve too: it would be desirable to automate for emergency situations so that trapped passengers could hear a human voice, start interacting and request a call to family or friends. He sees that as a huge opportunity for manufacturers.

- Calling to mind his own refrigerator monitor, **Rugova** sees another opportunity for elevator manufacturers to build on data and information visualization via monitors and, increasingly, to automate more here, too.

For Otis, **Smith** noted the continuing technical challenge of meshing robotic and human interaction. Getting robots to recognize when the elevator is full without constantly trying to reboard is still being finessed. There is great potential for robotics because all manner of delivery systems for food, linens and the like are now under scrutiny for labor cost savings. The challenge is to avoid degrading elevator service.

- **Dawson** agreed that AI and virtual assistants are still very limited in capability. That said, chatbots are showing real promise—and the technology is trainable. The acid test might be when passengers can 'prank the elevator' as they do Siri. If elevators can be fun and social, so much the better.

- **Ankerstjerne** believes there will be total integration in the future between elevators and robots who, increasingly, will be coming into the work environment to perform tasks such as cleaning, moving between different floors, finding their own way around, and optimizing the costs of doing so. This all depends on the core system. Eventually, however, recognition and service levels should evolve so as to be able to log arrivals in the car park and dispatch the elevator down to meet them. While it might be difficult to do that for, say 8,000 people in a building, some of these touchpoint facilities are available already, such as personal recognition by cell phone.

- **Garcia Parra**, moderating, asked a supplementary question: How do we create buildings which allow both active collaboration and areas where people can work, concentrate and have personal privacy?

- **Dawson** maintained that while managing buildings on behalf of landlords and aiming for efficiency, real estate professionals need to create spaces that people can either avoid or enjoy—but not necessarily by duplicating personal spaces inside their own facilities. In certain industries, people cannot take personal items in with them or have them sent to them, despite the availability of point-to-point service and delivery. Tenants may want that personal interface, but managers do not want it inside the walls for reasons of safety and security. Whatever support a landlord can provide here will be beneficial.

- **Ankerstjerne** considers Europe to have been in the forefront of enabling choice, but great progress has been made in the US over the past three years.

Choice is critical because everyone works differently and needs to collaborate differently too. WeWork has 16 different workspaces from huddle rooms, to collaboration rooms, sit/stand desks, conference rooms etc.

Generation Z use them all: they want to move between the physical space in a way that they are always connected and collaborating best or working most creatively.

It was not only about choice but also agility. Different physical situations suit different moods or ways of working. Very diverse designs are showing up in corporate workplaces and co-working spaces so as to accommodate different situations and different people.

Section 6 Monetization

Governing questions:
Will there be a day when the user will pay for value-added experiences, such as an express elevator for privacy or a personalized experience with an elevator?

From an advertising perspective, are facilities managers ready to receive advertising feeds next to traditional content?

Facilities managers might pay for an elevator that pre-briefs or informs visitors about the company they are visiting while alerting meeting organizers that they are on their way and will be in the lobby in 30 seconds. A business case would simply need to be made for the extra investment in terms of increased sales or revenue and a better customer experience.

As to advertising, it pertains more to occupiers who might want content that could reinforce the B2B relationship with their customers, but care would need to be taken as to execution and the scope might be limited here.

- **Dawson** agreed. In-car visual communication is a controllable part of the passenger experience and some useful lessons can be drawn from the hospitality and entertainment industries in which Otis participates, quite aside from the property management and proptech aspects in which Otis has extensive influence.

  The user experience may be owned by the HR organization, but opportunities exist for cross-collaboration in a multi-disciplinary team. He does not want to monetize his own team at EY, but wants them to benefit from the scale of the organization so it is a cultural, rather than a commercial issue for him.

- **Ankerstjerne** thought it might be difficult to monetize an express elevator service and that, conversely, this benefit could quickly sour because fast elevator service would become a standard expectation. He did see considerable opportunities in residential and retail areas however. Having large screens or all-encompassing graphics in the car could be much more engaging and valuable to passengers.

- **Dawson** mentioned that approximately $75 billion of VC funds has been invested in proptech since 2015, according to an EY survey.

  Otis is seen as a leader in its area and its willingness to share ideas on panels, such as at IFMA, is greatly appreciated.

- **Ankerstjerne** asked whether Otis could offer elevators for a monthly fee or provide people movement as a service rather than having the landlord or occupier pay the capital cost of installing the elevator and then paying for maintenance and modernization thereafter. Movement data could also be charged as part of a monthly fee.

- **Smith** for Otis said that was under active consideration for when buildings are under construction, as in charging general contractors per trip.

- **Ankerstjerne** added that aircraft engine manufacturers charge for flown mileage and other factors and, in return, look after all the maintenance, spare parts, fuel consumption and so forth.

  He sees this as an interesting development opportunity for Otis.

Open Questions

Audience question one:
Can an IoT upgrade be added into an existing elevator, thus avoiding the expense of installing a new elevator?

- **Smith**, for Otis, explained that the elevator needed to be changed over to a new microprocessor system to get the full benefits of IoT.

  Where this is not possible—as is the case with older systems or with some microprocessors from competitors—Otis can install a parallel solution. (This can be done even on old relay systems.) This parallel solution will capture critical data on usage and doors (which tend to generate most problems) without locking a facility manager into using Otis, or requiring a full-blown modernization. This compromise captures a very considerable amount of useful data in the cloud.

  With 2 million units installed, Otis can do a lot of predictive work and hence supply the information to do preventative maintenance.

Audience question two:
Is disruption in vertical transportation comparable to developments in communications, IoT and energy?

Is vertical transportation about to break out from the vertical plane and facilitate movement anywhere around the building, possibly mounted externally?

Is the elevator industry facing disruption akin to what Uber did to the taxi industry?

- **Smith** revealed that Otis tried horizontal and vertical movements 20 years ago, but shelved the program due to the huge capital investment required. To make such movement viable would require a new propulsion system. Currently, it is too slow and too expensive to move the elevator up, turn it and move it sideways. Developments in linear induction motors and maglevs may offer possible development pathways in the future.

- **Garcia Parra**, moderating, asked a supplementary question:
  How do you see elevator data being used by facility managers for prediction?

- **Dawson** said that EY relied on data for decision-making. Common structures, files and tools such as Tableau or Microsoft Power BI were central to this ability. The challenge for the industry was to leverage beyond this and give people better access to information that they can weigh for insights.

  Otis data could, he thought, be very important here. EY has a space utilization system that depends on IT data, dynamic IP addresses held on a management system, and data on cell phones, security guards and people movements. Since EY understands real people (at least in terms of service line and how long they stay in the facility), it will probably be able to run predictive analytics on likely headcount in four years' time.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