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Conversations with industry about IoT in…

THE COMMERCIAL REAL ESTATE (CRE) MARKET

– and how to combine 5G, AI, IoT, and Edge

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123RF

I t's widely accepted that 5G technology is billed as the connectivity fabric that will support a new era of consumer and enterprise experiences. But, in the context of smart bulidings and the commercial real estate industry, 5G is part of a larger equation that also includes other emerging technologies such as artificial intelligence (AI) and the Internet of Things (IoT). The combination of the three--5G, AI and IoT--will allow for real-time data collection and analysis that will make buildings more efficient and more user friendly. Those building owners implementing a robust technology strategy will be able to leverage these rapidly developing solution sets to reduce net operating expense while leveraging the technologies to drive up lease rates by providing new services. These technologies will also be essential to enable the implementation of emerging use cases in a post-COVID-19 era.

With 5G rollouts accelerating, 5G-enabled IoT applications are being introduced, offering new opportunities for building managers and CRE firms to improve efficiencies in building operations.

Enterprise IoT Insights talked with key industry leaders and analysts to know how the CRE market has been evolving in recent years, what technologies will be behind the more successful use cases in the CRE segment and what the main challenges remain for further tech implementations in buildings. It's time for the real players moving the market to talk. (A key to the speakers can be found in the box)..

The current state of the CRE industry, the technologies involved and the main challenges ahead

What is the role of IoT in the Commercial Real Estate (CRE) sector and how do you think that this technology is already contributing or will contribute in the increasing adoption of tech solutions by CRE firms?

Peterson/Boingo: As companies welcome employees back to the office, many new factors are at play. Businesses are converting to a hybrid workforce model to accommodate a new digital-first culture that merges remote and physical spaces. From implementing new health and safety standards to ensuring connectivity corner-to-corner, digital transformation has been prioritized, with IoT technologies front and center. With 5G, CRE properties will be able to roll out new connected applications. A small sampling of these applications includes smart parking, smart lighting and utilities management, touchless entry, cashless payments, digital wayfinding tools and more. When CRE executives navigate 5G, neutral host models should be prioritized. This will include merging licensed, shared and unlicensed networks for more throughput, reduced latency, better coverage and lower costs.

Corlis/KPMG: IoT devices sense different parameters like temperature, humidity, indoor air quality, occupancy, pathogens, lighting, etc. … on a continuous basis and transmit that information to a central core to make decisions enabling comfort, productivity, convenience to its occupants and also financial savings to the landlords. IoT can help with predictive maintenance avoiding the need for unplanned downtime for its occupants due to maintenance issues. Management can study the building usage patten, identify excess capacity and plan accordingly. IoT can also help in reducing energy usage in the building by monitoring ambient light, temperature, and occupancy and autonomously adjusting lighting and temperature.

Sharma/Honeywell Building Technology: Technologies like cellular, IoT, and artificial intelligence (AI) allow building owners to offer better occupant experiences that increase value, reduce vacancy and even secure rent premiums. To achieve these, maintaining a healthy building is critical. Building health and comfort starts with smart edge devices like sensors and actuators that improve indoor air quality (IAQ) via filtration, disinfection and ventilation. When coupled with AI, they also can turn data into actionable insights to make sure the building is providing the best experience.

Wagoner/JLL Technologies: IoT exponentially expands how the CRE industry uses technology and data-backed insights to inform business decisions. Historically, the CRE sector heavily utilized major IWMS and point technology solutions to manage the CRE function. Post-pandemic, the people who use the space are demanding an extension of these platforms to enable more flexibility, a better workplace experience and a more sustainable environment. IoT is essential for delivering on these expectations.

Look who's talking (in order of appearance)

Derek Peterson, CTO at Boingo Wireless

Greg Corlis, Principal Emerging Technologies, KPMG

Manish Sharma, VP, Chief Technology and Chief Product officer at Honeywell Building Technology (HBT)

Eddy Wagoner, CIO, Digital at JLL Technologies

Owen Kell, Senior Researcher, Memoori Research

Thomas Ricci, Principal Managing, Coretrust Capital Partners

Kevin Kinkaid, Technology Director at Grosvenor Group

Danny Tseng, Director of Technical Marketing, Qualcomm Technologies

James Mylett, Senior Vice President U.S. Digital Buildings, Schneider Electric

Kell/Memoori: The IoT is already making a significant positive contribution to the efficiency, safety, comfort and health outcomes of properties that have invested in it. IoT sensor technologies offer the opportunity to gather and analyse building user and building systems utilisation data at a more granular level in real-time or near real-time. The degree of sophistication of IoT solutions in the sector is varied, with most organisations still at the early stages of their IoT adoption journey, focussed primarily on applications centred on operational cost savings, while more forward-thinking organisations are going further, and using the IoT to develop services that optimize their operations and provide new means for market differentiation.

"IoT sensor technologies offer the opportunity to gather and analyse building user and building systems utilisation data at a more granular level in real-time or near real-time."

Owen Kell, Senior Researcher, Memoori Research

Ricci/Coretrust: IoT in CRE means that there are or will soon be ways to provide more data to me as a building owner, or more services to our tenants. Data might be something we garner from a BMS (building management system) sensor that is connected wirelessly that tells us building metrics or controls HVAC or lighting. Services might refer to the ability to market a building or space as cellular enhanced or having a DAS (distributed antenna system) that offers value to our tenants.

Kinkaid/Grosvenor: IoT technologies provide the ability for building operators not only to get an insight for how their buildings are used, but also to respond in real or near real-time. For example, IoT can integrate with buildings systems and automatically optimize lighting and air conditioning based on occupancy data in particular parts of the building, not only providing a healthier environment but also reducing operational costs and reducing carbon emissions. The continuous monitoring of IoT sensors allows data to be constantly collected, which in turn allows predictive analytics to preempt maintenance and repair, or detecting a leak and automatically notifying an engineer.

Tseng/Qualcomm Technologies: IoT solutions are connecting the unconnected and these smart solutions play an important role in sectors including construction and real estate. CRE firms can utilize IoT solutions to improve their properties, whether it's through better safety and security, inspection, transaction process (e.g., remote showing), construction management, and more.

Mylett/Schneider Electric: There are several prominent challenges CRE leaders are facing where IoT will be a focal point

in the solutioning. For example, buildings must be more people-centric today than ever before and the expectation for a more people-centric experience continues to escalate. This includes a stronger focus on building health, and on a tactical level, a heightened focus on indoor air quality and associated healthy building assurances. IoT-enabled analytics platforms which bring together seemingly disparate sets of data create actionable insights and better equip building owners and operators to ensure the building environment is safe and ready for occupancy.

With 5G already being deployed at a global level, what are the main benefits of this technology in the CRE sector? Are there already solid 5G use cases for this field?

Peterson/Boingo: Modern work environments can't be successfully supported by older, dated technologies if a building is to compete for tenants. Today's CRE properties demand the adoption of a comprehensive connected wireless strategy. 5G and converged wireless networks will keep offices resilient into the future. We're in the midst of digital transformation of real estate operations, and it's the first inning of a major change in how properties operate. Standards of offices and retail spaces which for years have been analog are digitizing with things like connected door locks, centralized package delivery lockers, and connected thermostats.

Corlis/KPMG: 5G's low latency, high bandwidth and slicing capability opens a plethora of possibilities for the CRE sector. With IoT going mainstream, commercial real estate are implementing many end points (sensors, cameras, etc.) that gather high volumes of data, some of which may need to be processed with low latency.

"True 5G for the building is still a year or two away as there are very limited devices available in the market. We are seeing a great deal of experimentation with private 4G networks, that are 5G ready (…) When 5G is truly ready to scale, I see it becoming the backbone of communications for buildings going forward working in concert with WiFi."

Greg Corlis, Principal Emerging Technologies, KPMG

Video streaming and conferencing benefits dramatically from low latency and high bandwidth. Remote management of an equipment through a digital twin requires low latency. Slicing allows each portion of the network to be allocated based on the needs of the application or use case providing building operators with much more granular control of bandwidth while also increasing security. All of that said, true 5G for the building is still a year or two away as there are very limited devices available in the market. We are seeing a great deal of experimentation with private 4G

networks, that are 5G ready, which will service 60 -70% of the building management use cases. When 5G is truly ready to scale, I see it becoming the backbone of communications for buildings going forward working in concert with Wi-Fi. Eventually wired networks will disappear, reducing infrastructure build costs with 5G providing companies the required bandwidth and low latency to operate their businesses.

Sharma/Honeywell Building Technology: Video technology, which is widely used for building security and surveillance, is one of the most immediate applications of 5G in buildings. Private 5G networks allow any connected technology to be faster, more reliable and scalable. Warehouses and stadiums have been early adopters of 5G networks, but as 5G becomes more affordable and accessible, we'll likely see the CRE sector invest more heavily in its infrastructure.

Wagoner/JLL: 5G provides major benefits in the CRE sector. Business leaders will need insights derived from a building's IoT devices in near real time. Employees will demand a better employee experience, including quicker response times to IT and facilities requests, streamlining desk and meeting room reservations, and supporting dynamic mobile applications for the workplace. With the number of IoT devices needed to manage flexibility and optimize real estate portfolios, coupled with the need for speed when delivering real-time experience in the workplace, the expectations of CRE occupiers cannot be met without the speed of 5G.

Kell/Memoori: From our research, while 5G has the potential to be transformative in other vertical markets, its impact in the CRE sector is less pronounced. Recent interviews we have conducted with vendors

in the smart building space indicate that 5G will have a limited medium-term impact on smart building IoT delivery, with short-range and wired technologies continuing to dominate for internal building systems. For the time being at least, 5G data is likely to be restricted to data transmission to the entrance of the building or reserved for more niche applications in smart buildings such as augmented reality or HD video streaming.

"The main benefits of 5G are faster speeds, lower latency, reliability, and better network efficiency. It can be a unified connectivity platform for a wide range of use cases, which can deliver improved user experiences, including drones for property inspection, cameras for improved security, safety, inspection, and monitoring, and reliable private networks for campuses or enterprises, among others."

Danny Tseng, director of technical marketing, Qualcomm Technologies

Kinkaid/Grosvenor: The key attributes of 5G will enable more real-time processing and analysis of IoT sensors. 5G network slicing can also be used by companies to create a secure, fast network which is available to their employees regardless of wherever they are.

Tseng/Qualcomm Technologies: The main benefits of 5G are faster speeds, lower latency, reliability, and better network efficiency. It can be a unified connectivity

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Kevin Kinkaid, Technology Director at Grosvenor Group

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And what is the relevance of artificial intelligence in the CRE sector and how can CRE firms can take advantage of this technology?

Peterson/Boingo: AI opens a new door for engagement. On the backend, virtualization of network technologies and integration of AI capabilities is allowing IT teams to develop networks that self-heal and incorporate a high-level of automation. We're doing this at Boingo for our enterprise customers and it can be a gamechanger. For any industry, CRE included, this advanced use of technology can streamline operations, reduce overhead, increase productivity and decrease costs.

Corlis/KPMG: AI has got a wide variety of applications when it comes to CRE and there are many avenues how CRE firms can take advantage of it. Think about parking garages that can identify open parking spot and guide drivers there. Think about the facility manager being alerted on an impending failure of an HVAC equipment and notifying the service technician and scheduling its maintenance without inconveniencing its occupants. Think about light level being maintained in the space autonomously considering available ambient light and current occupancy.

Kell/Memoori: AI powered solutions are the most mature in three main areas, notably energy efficiency (primarily through HVAC systems optimization based on IoT sensor data inputs), Security & Access

Control (computer vision & enhanced video analytics) and Space Utilisation & Occupancy Analytics. Other emerging application areas include Digital Twins, Threat & Emergency Notification, Water Management, Air Quality Monitoring and a variety of vertical market specific solutions. Market ready solutions with proven ROIs and well published case studies are now available in some of these leading areas.

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Which countries/regions are currently leading the way in terms of adoption of these technologies for the CRE sector?

Peterson/Boingo: The pandemic affected commercial real estate worldwide and we're seeing a global effort to adopt new technologies. In the U.S., 5G initiatives spearheaded by government agencies and the opening of the Citizens Broadband Radio Service (CBRS) are helping expand opportunities and encourage widespread adoption of next-generation connectivity technologies.

Corlis/KPMG: I don't really think there is a clear leader in the adoption of these technologies for CRE quite yet. North America is beginning to pick up speed but certain parts of Europe and the Middle East have already been aggressively deploying these types of solutions with Germany, the Netherlands and the United Arab Emirates being the front runners.

Wagoner/JLL: JLL is tracking nearly 8,000 proptech companies, a 300% increase in the rapidly evolving proptech landscape over the past decade. While the U.S. and Western Europe continue to have the greatest number of proptech companies, we've seen a rapid uptick in proptech adoption in APAC countries, including China and India. China is a leading adopter with a strong technology ecosystem, including a large presence of hardware companies and

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a flushed-out ecosystem of big tech firms. On the other hand, India has high levels of construction, and developers are taking the opportunity to build in new tools or retrofit. We're also seeing increases in Australia, Brazil, the Nordics and South Africa.

How did the COVID-19 pandemic accelerate the need of these technologies in the CRE sector?

Peterson/Boingo: The global pandemic accelerated digital transformation across nearly every industry. The CRE industry has moved quickly to adapt. Hoteling, for instance, is a new approach that replaces permanently assigned office seats with shared work areas. With fewer desks in smaller spaces, hoteling requires employees to reserve a workspace ahead of time when they need to come in. To make this model seamless, connectivity must be completely wireless, high-speed and secure with no dead spaces.

Sharma/Honeywell Building Technologies: COVID-19 accelerated the adoption of technology trends that originated before the pandemic. Even prior to COVID-19, CRE owners and operators had shifted their focus to improving the occupant experience, but the needs, demands and expectations of building occupants have evolved putting a greater emphasis IAQ and creating healthier, safer spaces. To meet occupants' new needs, smart buildings can use technologies like IoT, AI, and cellular to deliver frictionless experiences, healthier and comfortable spaces, near real-time visibility, safety and security, and sustainability and efficiency. This trend is here to stay as people are more aware of personal space and IAQ than ever before. As a result, we expect to see the CRE sector invest more in long-term technologies that create safer and healthier environments while generating energy efficiencies

and improving the productivity of facility teams and tenants' employees alike.

Wagoner/JLL: Technology has changed the CRE industry in many ways during the COVID-19 pandemic. There is the automation factor—using technology to handle certain tasks so that employees can focus on high-value work. Technology has also supported the transition to a flexible model of working from anywhere.

Kell/Memoori: Organizations that had invested in Smart Building IoT technologies prior to the pandemic were at a distinct advantage in terms of their visibility and control over their built assets during a time of such profound change to behaviors and risks, but others are now also investing in these technologies to improve resilience and future proof their buildings to mitigate pandemic and other systemic risks such as climate change or future economic shocks based on the lessons learnt.

Ricci/Coretrust: Building owners and managers, I think more than ever, need to highlight the technology advantages that their building may have, given the rise of work from home and companies' acceptance. And in that new reality I think tenants are going to expect a higher level of Wi-Fi or great cellular connectivity in their office, than they have or can afford at home. If you have it in your building, it may help you stand out more and drive greater tenant retention. I believe the pandemic has accelerated us into an age of office building "haves" and "have-nots".

Kinkaid/Grosvenor: IoT enables the collection of data on how a building is being used - areas which are used more frequently may require more frequent cleaning for example, or it can automatically monitor

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and control the air circulation and ventilation as required. The additional capacity and speed of 5G enables more data to be transmitted quicker, which will allow more advanced real-time data analysis to be performed. The pandemic also brought about a fundamental shift in remote working, with hybrid working now here to stay. Connectivity is key to this and 5G will enable much better connectivity regardless of where people are. 5G network slicing will enable companies to provide a dedicated 'slice' of

a 5G network to their employees – allowing better security and dedicated bandwidth.

Mylett/Schneider Electric: The pandemic created significant obstacles to accessing buildings and those who had made investments in AI and remote connectivity were clearly advantaged. For many firms, transforming to a more digitally enabled service model in a pre-pandemic environment was a significant change management challenge. During the pandemic, transforming to digital-first became a survival strategy. For example, CRE firms who had invested in IoT and AI for their building environment were better positioned to ensure the building's indoor air quality was at a safe level and better positioned to pivot the building operation to revised operating parameters for a low to no occupancy mode. We also know that once new technologies and new ways of working are experienced, it becomes difficult or in some cases intolerable to revert to the way things were.

What are the new priorities for the commercial real estate sector from a tech point of view following the impact of the pandemic?
Peterson/Boingo: We're seeing industries unify around a common goal—health and safety. For the CRE sector to effectively implement safety protocols—from hybrid workplaces to contact tracing and cleaning procedures with continually purified air and sanitized areas—technology is required. Today's safety requirements are also digital requirements. Now more than ever, a strong wireless strategy is key. 5G has arrived and fast, secure networks are the new table stakes, whether in an office or mixed-use spaces like retail and restaurants.

Corlis/KPMG: Commercial Real Estate is no more just the physical building that we are

used to. It's role previously had been very limited in the construction of these commercial buildings. That legacy approach is now changing with building owners and operators now seeking ways to differentiate their properties through the use of smart building technologies such as IoT, AI, digital twins and private cellular networks. From a tech point of view, the priorities for CRE sector are to build the needed technology infrastructure so as to enable a better experience for its tenants, occupants and their guests. The buildings need to be future ready with its communication

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infrastructure like 5G and also implement multitude of IoT sensors enabling many use cases like energy efficiency, predictive maintenance and optimized building usage based on occupancy, usage pattern and behavior, among others.

Sharma/ Honeywell Building Technologies: To meet occupants' elevated expectations of returning to the office, new technologies and applications need to be deployed in commercial buildings. Another priority for the CRE professional is creating and maintaining safer and healthier environments. For instance, analytics systems integrated into building management systems allow staff to monitor air quality, humidity, pressure and even occupant behavior through real-time data. Video analytics integrated into security systems tracks traffic patterns in a building to keep occupancy numbers to acceptable levels and to monitor compliance with social distancing and mask guidelines.

Wagoner/JLL: The role of the office is changing, and technology is helping employees work effectively, regardless of location. When they are in the office, cellular technologies, IoT and AI are ensuring employee health and safety, which is paramount. Sustainability is also a priority, and IoT and AI can help buildings and those that occupy them lessen their environmental impact. Pre-pandemic, many viewed these technology benefits as a "nice to have." But they are becoming table stakes to attract and retain occupiers as their people demand flexibility; a better, healthier workplace experience; and increased sustainability.

Ricci/Coretust: Cleaning, Sanitizing, Disinfecting, Indoor Environmental Quality (IEQ), Indoor Air Quality (IAQ), Indoor Water Quality (IWQ) and Health and Wellness Initiatives will be top of mind for owners, managers and tenants. It is a given the building should be safe, smart and technologically advanced and possess essential

tools and services our customers need to be successful at what they do.

Tseng/Qualcomm Technologies: 5G, IoT and AI can help improve the safety and efficiency of a property. For example, smart, connected cameras can identify who is entering buildings and where they are sitting, so if there is a close-contact case the building owner/occupier can identify who was near the infected person. 5G and AI enabled drones can inspect property and hard to reach areas safely and securely delivering high definition camera and video footage in a matter of minutes which is more cost-effective and safer.

In a post-COVID scenario, what would be the key requirements from tenants which should be satisfied by building owners and how technologies such as 5G, IoT and AI could help?

Peterson/Boingo: Tenants are looking for increased safety with touchless features and guaranteed 24/7, reliable Internet access for general connectivity usage and to power a growing number of IoT devices. To meet these demands, offices are using wireless networks to adopt touchless technologies to summon elevators, check employee temperatures and perform basic tasks like opening doors, dispensing soap and water in restrooms, and sanitizing surfaces. With new shared workspaces changing the fundamentals of office design, sophisticated, connected HVAC systems are also being installed to filter indoor air and reduce airborne contaminants.

Wagoner/JLL: Tenants want the buildings they occupy to be safe, sustainable and straightforward. In the post-pandemic work environment, when they come into the office, tenants want technology that enables them to work seamlessly, flexibly

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Eddy Wagoner, CIO, Digital at JLL Technologies

and collaboratively—when working in a hybrid and flexible workplace, they don't have time to work out the kinks while running a business. Technologies including 5G, IoT and AI are great piecemeal, but the building owners who gain competitive advantage will be those who implement 5G, IoT and AI holistically. For instance, IoT and AI can pair together to deliver insights that businesses need to operate intelligently

and efficiently. Add in 5G, and everything works at near real-time speeds. The tenant experience becomes that much better.

Kell/Memoori: COVID-19 appears to now be endemic, so its risks will persist. As such tenants have adapted their behaviors and expectations of indoor environments. Visible evidence that building owners and managers are helping to keep building

users safe through technologies that improve hygiene levels, maintain healthy air quality, enable effective social distancing and support hybrid and flexible working practices will help reassure end users and offer competitive advantage.

Kinkaid/Grosvenor: In a post-pandemic scenario, it is highly likely that some form of hybrid working will remain for the long term, with employees choosing to spend part of their time away from the office. Employees will need a good reason to go into the office and will also want the office environment to be safe. Building services can also be improved, leveraging the building occupancy and usage data to direct when and where cleaning is required most – saving cost and improving tenant satisfaction by ensuring that places are cleaned as required and not just to a fixed schedule. Lighting and ventilation can also be adjusted depending on how a building is used, improving health and safety of occupants.

Which of these emerging technologies are more suitable to guarantee the fulfillment of safety and sanitary protocols in buildings? Are you already seeing a high level of adoption of new technology for the post-pandemic scenario?

Peterson/Boingo: A new offering is private networks. The closed network solution is designed to deliver the increased security, reliability, lower latency and bandwidth required to enable enterprise applications. In commercial real estate, private networks can run on the Citizens Broadband Radio Service spectrum (CBRS) and are ideal for powering IoT connectivity, security management and connected utilities. There is no one-size-fits-all technology solution for CRE. What is required is a seamless convergence of various technologies to meet and exceed tenants' continuous expectations for high-speed mobile data service anytime, anywhere on a commercial real estate property.

Corlis/KPMG: I strongly believe that Digital Twins, AI, 5G and IoT when used in tandem are best suited to help with the fulfillment of safety and sanitary protocols in the building. 5G streaming cameras in conjunction with AI and computer vision can monitor in real time for any intruders or suspicious behavior and alert concerned people including law enforcement and fire departments.

Sharma/Honeywell Building Technology: Each of these emerging technologies are important in creating a healthier building, but a layering approach works best in considering different solutions that together provide a safer environment. IoT and AI offer building operators scalability and constant learning of the specific site. Pairing smart edge devices like sensors and actuators throughout a building with

AI-driven software can enable building managers to receive insights and better predict outcomes, like traffic patterns throughout the building or even when air strategies need to be adjusted based on time of day and occupancy levels. Implementing these technologies is not just a response to the pandemic. These technologies help building owners provide better occupant experiences that respond to daily comfort needs, including light levels, air quality and temperature.

Wagoner/JLL: IoT, combined with AI, can provide a safety net in buildings to ensure that sanitation protocols are being followed. If employees use a meeting room, IoT sensors with the support of AI can alert maintenance when the room is empty and verify once cleaning is complete. The start of the pandemic served as a real-time pilot for how technology could support the transition to working remotely. CRE leaders see the value in technology, and it's now going to be a key factor in bringing their teams back to the office post-pandemic.

What are the main obstacles that are preventing a more rapid adoption of new technologies such as IoT, 5G or AI in the CRE sector? Are these obstacles more related to the tech side or the challenge is more related to the financing of these initiatives?

Wagoner/JLL: The obstacle is a mix of factors: hesitation to change; a lack of familiarity with the options available to them; making the case for budget, especially during a time of uncertainty; and limited time to spend pilot testing and deploying when the business needs to operate at an accelerated pace.

Kell/Memoori: Demonstrating returns is becoming easier as the range and quality

of case studies and use cases improves, particularly for "low hanging fruit" applications such as energy efficiency. However er developing a solid business case with demonstrable and satisfactory ROI is still challenging, particularly for applications whose metrics are somewhat intangible (e.g. tenant satisfaction, worker productivity, staff retention rates). Another challenge is the lack of knowledge and skills, particularly in domains such as AI and Cybersecurity, and for specialists with the appropriate blend of IT and OT skills. Also, poor cybersecurity management from end-users and device manufacturers remains an issue. Many IoT devices are still being shipped with default settings that communicate over unencrypted protocols, opening them up to traffic sniffing and tampering of sensitive information, and new device vulnerabilities are being discovered on a daily basis. Regular data breaches erode public trust.

Ricci/Coretrust: Certainly, most of these technology cycles noted here involve cost for initial equipment and cost for operations and maintenance. And then there is the factor of how long is this specific technology's expected lifetime: is it 2, 5, 10 years or more? With DAS, there are the economic models of who pays for what; the building owner, the carrier, or a combination? And are those models shifting or changing with time. These are all potential obstacles and challenges to work through.

Kinkaid/Grosvenor: 5G has a higher frequency than 4G, so it is often difficult to permeate through buildings – meaning that more antennae are required and/or the building needs to boost the 5G signal (which may not be economically viable for smaller buildings, especially if it already has good connectivity through a wired network). Real estate cybersecurity is another

"With the rise of IoT, 5G and AI within the CRE sector, it is imperative to have a succinct strategy on integration and utilization of these technologies for informed decision making. Building operators and owners invest in these technologies with an aim to improve building health and to deliver a people-centric experience. However without a strategy correlating the investment in technology to outcomes and experiences, it becomes an obstacle in accelerating adoption."

James Mylett, Senior Vice President U.S. Digital Buildings, Schneider Electric

obstacle to uptake. As building become more networked and connected, they also become more open to cyberattack and disruption – whilst previously a BMS may have been controlled from a standalone computer in a control room, it is now designed to be open to sharing data and being controlled remotely. This, combined with

the proliferation of other IoT connected devices throughout the building significantly increases the risk of cyber-disruption. Overall, the technology is there to be used, but implementing it will take time – not only to incorporate the technology into new buildings or retrofit existing buildings, but also to bring different skillsets into property companies who can manage and use the data effectively.

Mylett/Schneider Electric: Technological and financial challenges exist and contribute but are not necessarily the main blocker. With the rise of IoT, 5G and AI within the CRE sector, it is imperative to have a succinct strategy on integration and utilization of these technologies for informed decision making. Building operators and owners invest in these technologies with an aim to improve building health and to deliver a people-centric experience. However without a strategy correlating the investment in technology to outcomes and experiences, it becomes an obstacle in accelerating adoption.

There are several use cases of 5G and IoT for the CRE sector. If we think long-term, what new use cases could emerge thanks to these technologies?

Peterson/Boingo: The possibilities with 5G and IoT in the CRE sector are limitless. As 5G technologies become more readily available and adoption increases, we'll only see more and more innovation and an expansion of what's possible. We're certainly going to continue to see a push for digital payments, touchless features throughout properties, self-service kiosks, automation across common touchpoints, and the emergence of robotic cleaning devices and predictive maintenance features.

Sharma/Honeywell Building Technology: A new IoT- and software-enabled discipline called enterprise performance management (EPM) is a suite of critical applications to improve operations, safety and sustainability for building owners, operators and occupants. EPM provides a system of record for all things building-related and is the digital backbone for all building applications. Long term, using IoT-driven strategies like EPM gives owners and operators of any size building portfolio the opportunity to save energy, reduce costs, enhance bottom-line performance and meet the sustainability expectations of government agencies, employees, customers and neighbors in the community.

Kinkaid/Grosvenor: Digital twins will start to become more prevalent – at the moment, they are costly to implement and operate, but as more buildings become IoT equipped and 5G is rolled out to enable data transfer, then they will become easier to implement and more cost effective to maintain. Augmented reality assistance for field operators will also become more prevalent.

Mylett/Schneider Electric: With the expectation of 5G delivering ultra-fast response times and wide bandwidth capabilities, building operators and owners will be able to push their IoT and AI further to the edge. This transformation of communication technology allows firms to push data and analytics closer to building systems and occupants, providing real-time insights into the health and resiliency of the building and how the occupants within the building are interacting with it. This enables the building to self-heal or adapt to the real-time conditions autonomously. ●

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- 45,000 leads generated annually
- Industry leading demand generation programs and results
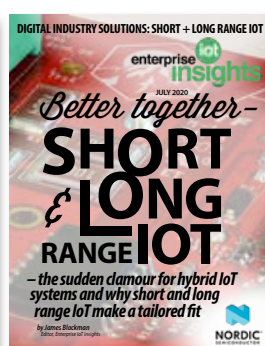
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