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SMART BUILDING TECHNOLOGY

The Future of Connectivity in Commercial Real Estate

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Contents

The Future of Connectivity is Smart

Smart building technology holds immense significance in both the design and operations of commercial facilities, revolutionizing the way these spaces function and interact with their users. At the core of this importance is the ability of smart systems to enhance efficiency, sustainability, and user experience. From integrated systems for greater automation and control to adaptive environments for occupants, smart buildings can optimize operations, reduce costs and redefine the way spaces are designed to create a more intelligent and user-centric built environment that fosters connectivity and collaboration.

As smart buildings continue to advance, navigating the landscape of technology integration will be essential. That's why we've assembled this eHandbook that's packed with practical information about the latest topics around smart buildings, including how AI is revolutionizing building design, future-proofing the office through integration, helpful guidelines for cybersecurity practices and other tips to help set you up for success. We've also included two real-world case studies of some of the smartest buildings in the U.S., as well as products that can help make your facility a little more connected.

We hope you find this digital resource valuable as you navigate the ever-changing landscape of smart buildings.

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Organizations are expected to provide flexible conferencing and collaboration technologies that enable operational consistency no matter what.

Courtesy of Airtame

Technology is the Backbone of a Successful Hybrid Workforce

by Dan Deem

Until 2020, remote and hybrid work arrangements constituted a small fraction of the workforce, mostly comprising freelancers and contractors. Following significant occupancy restrictions and precautions related to COVID-19, studies began showing a dramatic shift in practices and expectations. The rapid growth of working independently at different locations contributed to more than 50% of workers saying in 2020 that they would consider quitting their job if flexibility was not offered, and 63% preferring a hybrid work arrangement.

The good news for businesses is that fostering a flexible work environment can reduce overhead and even benefit productivity through the use of modern conferencing and collaboration technologies. As we move forward, organizations of all kinds will be expected to provide flexible options that enable operational consistency regardless of external or personal circumstances.

THE DAILY GRIND

Much of office work today consists of individual tasks interspersed with meetings that may host dozens or even hundreds of participants from different time zones or continents. For hybrid workers who may host a meeting from their home office one day and a corporate conference room the next, it's vital that employers provide easy-to-use technology tools that enable fast meeting setup and reliable connections for a wide assortment of devices. Without proper tools, meetings are ineffective.

As this hybrid trend accelerated among workers and employers, technology manufacturers responded by rapidly developing new solutions that can turn any room into a plug-and-play BYOD conferencing space. However, even the phrase "plug-and-play" fails to express how amazingly simple daily conferencing can be using the latest solutions.

CONSTANT CONNECTION

Whether at home or at the office, high-speed wireless connectivity is vital for many of our day-to-day tasks. As we've grown accustomed to using our own laptops and mobile devices to complete work as necessary, it has fallen on business owners to ensure that each device can simply and safely connect to the wireless network. Considering that up to 64% of workers cite hybrid collaboration spaces as being vital to positive in-office experiences, it is critically important to develop easy-to-use conferencing areas that provide reliably high-quality communications.

Deploying in-room hybrid conferencing technologies can help simplify meeting setup and management by giving users the ability to quickly launch video conference calls through platforms such as Zoom or Microsoft Teams. With the additional option of using hybrid conferencing solutions to instantly screen share from mobile devices or laptops, this kind of technology empowers office managers and meeting participants to create a variety of meeting and conferencing areas that range from small huddle spaces to executive boardrooms and lecture halls.

STREAMLINED SIMPLICITY

The best technologies are ones that we trust to operate effectively and efficiently on their own. Ineffective or hard-to-use systems are a major pain point for any organization, as they can interrupt productivity, introduce stress and anxiety, and incur additional maintenance costs or IT attention. Today device-agnostic systems are generally the best prepared to adapt to future protocols and applications, and they are consequently growing in popularity and use.

A corporate environment in which an in-person meeting participant can easily connect their personal devices with a central display immediately improves the overall experience. Further, corporations can integrate existing displays together across multiple buildings or locations, forming a wireless digital signage network with centralized control that can distribute messaging or be used to broadcast internal meetings.

MAXIMIZE PERFORMANCE, MINIMIZE COST

When it comes to digital displays, the common perception is that bigger is always better, and that's true for most basic display needs in most rooms. Now that our use of displays has diversified to include touch screen applications such as live annotation, this mantra can lead to systems that are more costly and complicated than necessary for normal usage. While a large touch screen can have obvious benefits for various use cases, for instance, alternative solutions can deliver the same capabilities using a non-touch screen display by enabling real-time interaction with personal touch screen devices.

As different work environments may require different features or capabilities to satisfy specific use cases, room designers and tech buyers should evaluate competing technologies to determine which is more likely to continue meeting their needs five years or seven years down the road. This is true for any environment considering implementing hybrid collaboration technologies, from school universities to hybrid offices—and everything in between.

FUTURE FUNCTIONALITY

When considering the lifespan and utility of audiovisual technology expenditures, one relatively new factor is the availability of software solutions provided as an ongoing service. These software-as-a-service (SaaS) options generally provide ongoing enhancements to services and capabilities and can help to regulate costs while extending the useful lifespan of integrated hardware solutions.

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The future of building automation: More user-friendliness, simpler networking and a more sustainable environmental sensor system.

Building automation essentially pursues three goals:

1. to optimize building efficiency and reduce operating costs
2. to increase the safety of people and technology in the building
3. to increase comfort and well-being in the building

In order to meet the requirements of modern building architecture, the industry is increasingly focusing on wireless communication and reliable environmental sensors.

Wireless Modbus facilitates the expansion and modernization of existing building networks in particular. The air purity and energy efficiency of rooms is guaranteed thanks to reliable flow sensors and demand-orientated individual room control—autonomous or in a network—is also becoming increasingly important. It is advantageous being able to fall back on a manufacturer that combines its many years of expertise in all these key areas.

WIRELESS COMMUNICATION WITH W-MODBUS FOR INTELLIGENT HVAC AND BUILDING AUTOMATION

W-Modbus is a radio-based further development of the proven Modbus standard and makes it easier to set up intelligent building automation thanks to reliable and secure wireless communication.

Within the wireless Modbus RTU network, wired products can be easily replaced, added or removed by wireless devices in just a few minutes. The standardized Modbus protocol is retained.

The new technology scores highly in terms of cost savings, increased flexibility and reduced installation and maintenance costs. Thanks to the reliable and interference-resistant wireless network, it is possible to network entire buildings.

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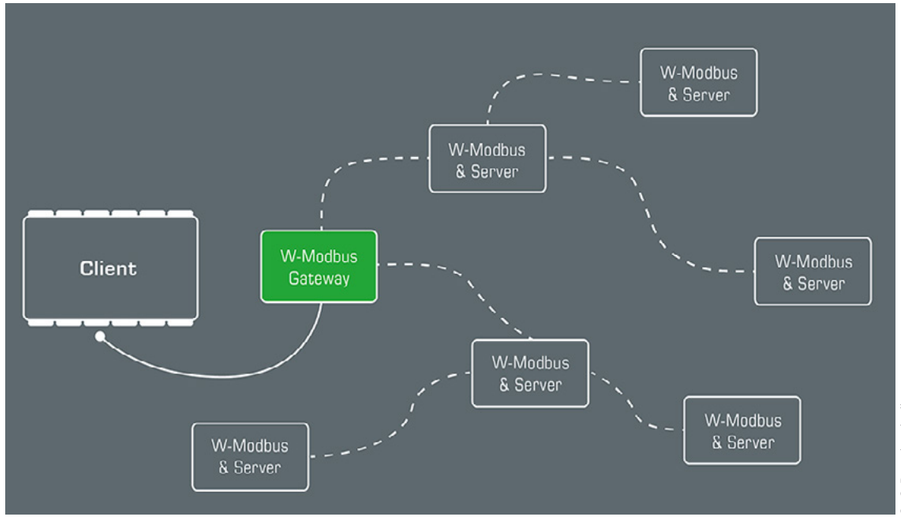

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HOW IS A W-MODBUS NETWORK SET UP?

A W-Modbus network consists of a W-Modbus gateway, which is connected to the Modbus client via an RS485 cable and wirelessly to up to 100 W-Modbus devices. The signals are transmitted reliably and with low latency.

Thanks to the wireless connections, troubleshooting is also extremely easy. Instead of searching for faulty cables and devices in the system as before, fault analysis is now limited to checking the devices. Particularly user-friendly here are device variants with a display: in the event of a fault (e.g. communication interrupted), the display shows a plain text diagnostic message. This means that the current status of the device can be found out immediately. This saves an enormous amount of time and money.

S+S offers wireless Modbus devices for measuring and monitoring temperature, humidity and pressure.

FLOW VELOCITIES AND VOLUME FLOW FOR MORE SUSTAINABILITY, BETTER ENERGY EFFICIENCY AND A HEALTHY INDOOR CLIMATE

Really good indoor air requires constant monitoring. Elementary factors for assessing and ensuring air quality are flow velocity and volume flow in ventilation systems, on fans, control dampers, humidifiers or electric heating registers.

Intelligent air flow sensors improve your energy efficiency and sustainability—ventilate, heat and cool your rooms in a controlled and energy-saving manner in future. The compact devices are available as duct sensors or for surface or top-hat rail mounting, can be optionally equipped with an illuminated display and some have a Modbus interface for even easier and faster integration into building automation. With the AERASGARD® product family, S+S Regeltechnik offers a wide range of flow sensors of the highest quality and reliability.

S+S Regeltechnik

FULFILL INDIVIDUAL NEEDS WITH INTELLIGENT INDIVIDUAL ROOM CONTROL

Whether office, doctor's surgery, catering, hotel or private rooms: building automation should be versatile and smart. The aim is to harmonize a wide range of events and conditions. Temperature, fans, sun protection and lighting should be individually adjustable and the feel-good climate should be controllable. At the same time, the specifications and requirements of the building management system must be reliably met at all times.

The new generation of Rymaskon® devices fulfills these requirements—whether as a stand-alone controller for individual control of room functions or as an interface device for displaying the set values and communicating with the building management system.

Thanks to intelligent (wireless) Modbus communication, the devices can also be seamlessly integrated into existing building management systems. An attractive appearance, optionally in black or white, is just as important as a high-contrast, flexibly configurable color display and the ability to freely adapt the menu language.

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Can AI help make BIM's complex information more user-friendly?

Courtesy of Symetri/iStock

Using GPT AI with BIM Models: A Comprehensive Approach to Revolutionize Building Management

In today's world of building management, there is an ever-growing need for easily accessible, precise information. One technology that has dramatically changed the landscape of building design and management is Building Information Modeling (BIM).

by Jeff Chen, George Broadbent

BIM provides a rich digital representation of the physical and functional aspects of a building. It is a game-changer, but what if there were ways to make this complex information even more user-friendly? This is where Artificial Intelligence (AI), particularly Generative Pre-training Transformer (GPT), enters the picture.

A TWO-LAYERED AI APPROACH TO BIM

While BIM has undoubtedly revolutionized building management, understanding it can often seem overwhelming for non-technical staff such as facilities managers or building owners. Integrating GPT AI with BIM can bridge this gap by creating a system where natural language queries can be used to interact with the BIM model. However, this integration is not straightforward.

Feeding an entire BIM model, often structured as a lengthy JavaScript Object Notation (JSON) file, directly to GPT would not only be costly but also impractical due to AI's limitations. Moreover, GPT might not understand what the different elements represent, as it is primarily trained on text content.

To overcome these challenges, a two-layered AI approach is proposed. The first layer involves GPT AI, which excels at interpreting the user's intent from their query. For instance, if a user asks, "Where is the supply air system?" GPT AI interprets this request as a desire to highlight all elements related to the supply air system in the BIM model.

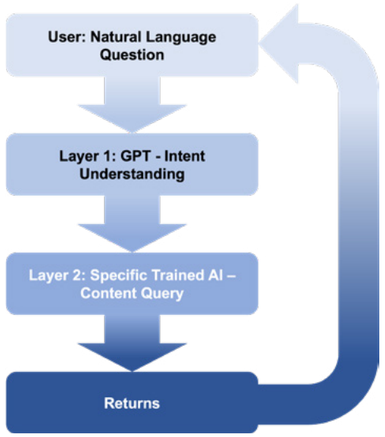


Figure 1: *Pairing GPT AI with BIM will require a two-layered approach.*

Courtesy of Dr. Jeff Chen

The second layer involves a different AI, specifically trained to interact with BIM models. This AI takes the interpreted request from GPT AI and performs the actual query on the BIM model, ensuring accurate and effective data retrieval. A highly conceptual diagram is illustrated in **Figure 1**.

BEYOND BIM MODELS: EXPLORING THE POTENTIAL OF AI IN BUILDING OPERATIONS AND MAINTENANCE

The potential of AI in building management extends beyond just directly working with BIM models. Building Operations and Maintenance (O&M) involves utilizing numerous procedures, manuals, and instructions for different assets. These can also be efficiently managed using AI when querying the BIM model.

Imagine being able to ask an AI system, "How should AC unit model XYZ be maintained?" and receiving an instant response with precise instructions from the corresponding maintenance manual. However, since GPT AI has a knowledge cut-off and is not continuously updated, it cannot provide answers to questions about data or specific building data introduced after a certain date. Additionally, constantly updating AI with all these documents and knowledge to fine-tune the model is both time-consuming and expensive.

EMBRACING EMERGING TECHNOLOGIES: EMBEDDINGS AND VECTOR DATABASES

Emerging technologies such as embeddings and vector databases offer a solution to these challenges. Embeddings are a way of representing data. They are a powerful tool that converts text into vectors of numbers, essentially creating a mathematical representation of data. It captures the relationships between different words or phrases and represents complex documents as well as their metadata in a simpler form. Vector databases, on the other hand, allow efficient searching of these embeddings.

Applying these technologies to building management can convert all the building's documents and instructions into a vector form and store them in a vector database. This allows GPT AI to perform quick and efficient searches, providing accurate, relevant information on demand. This is shown in **Figure 2**. While the intricacies of these technologies and their application warrant a more extensive exploration, the transformative potential they hold for building management is evident.

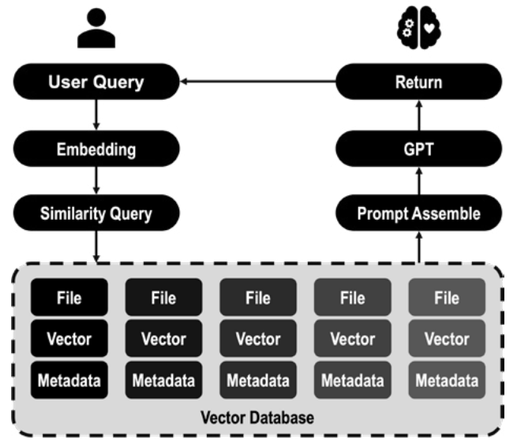


Figure 2: *Converting all of the building's documents and instructions into a vector form and storing them in a database allows GPT AI to perform searches quickly and efficiently and deliver relevant results.*

Courtesy of Dr. Jeff Chen

CASE STUDY: HARNESSING AI AND BIM

Visualize the transformative potential of integrating AI with BIM models and employing emerging technologies through a scenario featuring a seasoned facilities manager of a commercial building.

Recognizing the power of AI and BIM, the facilities manager adopts an

integrated AI system for efficient building management. When a query regarding the maintenance of the HVAC system arises, there is no need to navigate through complex BIM models or consult with technical experts.

The next step is to simply pose the question, "How can the second floor HVAC system be isolated?" to the AI. The GPT AI, serving as the first layer, interprets the query, and the second layer AI, trained to interact with BIM models, retrieves the necessary data from the model. The manager gets a precise answer almost instantaneously, enabling swift, data-driven decisions.

The same facilities manager, also responsible for the building's O&M, faces the challenge of picking the proper procedure from numerous asset-specific documents. Fortunately, all the building's O&M documents have already been digitized, converted into vectors and stored in a vector database.

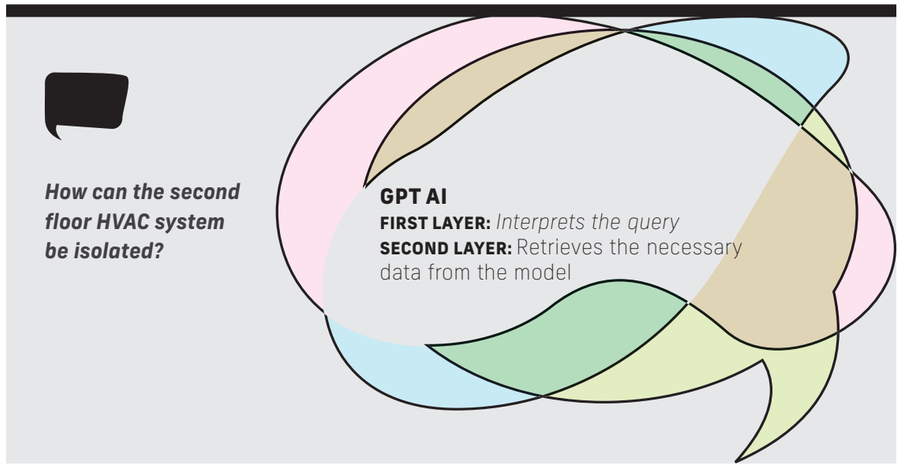
THE INTEGRATION OF GPT AI WITH BIM SIGNALS A NEW ERA IN BUILDING MANAGEMENT. THIS COLLABORATION NOT ONLY MAKES BIM MORE ACCESSIBLE TO A BROADER AUDIENCE BUT ALSO TRANSFORMS MANAGEMENT AND MAINTENANCE OF BUILDINGS, ENABLING A MORE EFFICIENT, USER-FRIENDLY INTERACTION WITH COMPLEX BUILDING DATA.

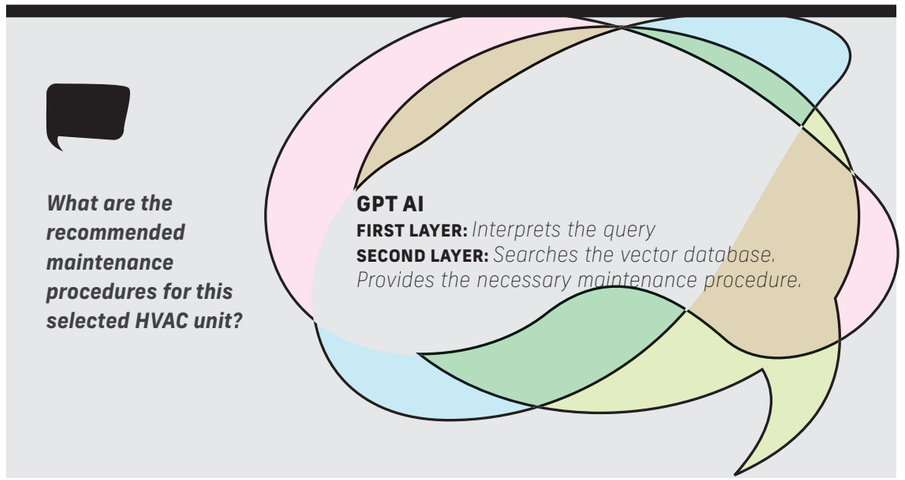
So, when there is a need to know, "What are the recommended maintenance procedures for this selected HVAC unit?" the next step is to simply ask the AI. The AI, powered by GPT, interprets the query, searches the vector database and quickly provides the necessary maintenance procedure, saving considerable time and effort.

This integrated scenario showcases the immense potential of combining GPT AI with BIM and utilizing the power of emerging technologies. Such an approach significantly simplifies building management, making it more accessible and efficient and paving the way for a comprehensive, user-friendly future in managing built environments.

CONCLUSION

The integration of GPT AI with BIM signals a new era in building management. This collaboration not only makes BIM more accessible to a broader audience but also transforms management and maintenance of buildings, enabling a more efficient, user-friendly interaction with complex building data.





By enabling natural language interaction with BIM models and other crucial documents, it democratizes access to essential data, making building management more engaging and intuitive. As AI and other emerging technologies continue to be embraced, they bring closer a future where buildings are not just structures, but responsive entities that communicate and interact with facilities management in a meaningful way. The future of building management is indeed exciting and promises endless possibilities.

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Leveraging the Metaverse and IoT for a More Sustainable Workplace

Innovative technologies promise to reduce waste, optimize operations, improve company culture and create healthier workplaces.

by Erin McDannald

Experts agree that remote work is here to stay. With an ever-increasing reliance on digital platforms to collaborate and complete tasks in the hybrid work model, the metaverse and IoT (Internet of Things) technologies already have a significant impact on our daily lives.

IoT technologies have seen rapid development in the consumer and residential spaces for convenience, security, and energy conservation, but have more recently made tremendous strides in the workplace. In addition to increasing productivity and elevating the office environment with modern convenience and sophistication, these innovative systems help offices reduce waste, optimize operations, foster community, and monitor processes more effectively.

Another advancement comes in the form of the metaverse, which carries massive potential in the workplace to improve company culture and mentorship. It also presents the added benefit of improving environmental impact and promoting healthier workspaces for staff.

THE IMPACT OF THE METAVERSE ON REMOTE WORK

The metaverse provides an opportunity for business leaders to reduce their carbon footprint by eliminating or reducing commuting, travel, and building emissions while still achieving the same level of business ROI as working in-person. According to statistical analysis reported by Intuition, after the global pandemic, 92% of people surveyed expect to work from home at

least one day per week and 80% expected to work at least three days from home per week. The same report found that "66% of executives considered reorganizing company office space to accommodate hybrid work." With its ability to support remote and hybrid working environments while connecting employees in digital space, the metaverse can help businesses improve their carbon footprints and introduce sustainable practices.

The metaverse provides a new, culture-enhancing vehicle for hybrid work by bridging the gap between those working remotely and those in the physical workplace. Allowing employees to engage and collaborate from home, users operate customized avatars in a digital environment to complete tasks and conference with each other.

The workplace metaverses can be built as a digital twin of the physical workspace, giving remote employees an immersive representation of the physical office where they can meet with their in-person colleagues while offsite. Rather than relying on remote conferencing for every meeting, teams can develop bonds and collaborate in the metaverse. Further, metaverse environments are also impression-rich places to welcome guests, clients, peers, and beyond while perfectly displaying company culture and brand. This replacement of physical appointments for a virtual workspace requires fewer resources and reduces the need for in-person business travel and daily commuting. The metaverse can be just as effective as working in the physical office and eases the effects of reduced collaboration within remote-only teams.

Another benefit of digital twin technology is it allows us to optimize the physical world by examining it through the lens of virtual reality. Using smart technology and robust analytics, architects and designers can make more accurate predictions about factors such as carbon emissions, air quality control, energy expenditures and other elements impacting workplace resource allocation. This thorough analysis can be used to make more informed decisions, helping companies improve ESG efforts and reduce waste.

IOT, ENERGY CONSERVATION, AND USER HEALTH

Advancements in IoT technologies and artificial intelligence (AI) have continuously transformed how we operate on a daily basis. From smart home assistants to wearable tech and a plethora of voice-activated gadgets, IoT has expanded rapidly and the number of such devices is expected to

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triple by 2023. However, as the workplace becomes a new playing field for smart tech, employers are acting on the opportunity to reduce energy use and support ESG efforts. In fact, analysis by the World Economic Forum indicates that 84% of current IoT deployments are "addressing or have the potential to address" the UN's Sustainable Development Goals.

One way that IoT enables environmentally-friendly and cost-effective measures is by tracking the usage of lighting and high-energy appliances such as printers, coffee makers and other equipment. Using occupancy sensors in coordination with smart thermostats, lighting and integrated appliances enables data-driven and cost-effective energy consumption through actions such as optimizing or powering down these systems automatically during low-usage times. This process has the added benefit of reducing operating costs, while data from room sensors enables smart scheduling tools and reports on trends for things like meeting frequency, attendance and the need for volume or size of communal spaces.

IoT technologies can also be used to make the physical workplace healthier by monitoring and controlling temperature, humidity and air quality levels to create a safer post-pandemic workplace. With these systems in place, office managers and building owners can receive in-depth data about the wellness and comfortability of their buildings (even if they're remote), including metrics on germicidal cleaning, virus detection, air quality, daylight harvesting, shade controls and smart thermostat integration. When employees want or need to go into the office, they can be assured that their health and wellness are taken into consideration.

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Future Proof the Office with Smart Tech Integration

Smart design in support of technology can help draw people back to the office.

by Janelle Penny

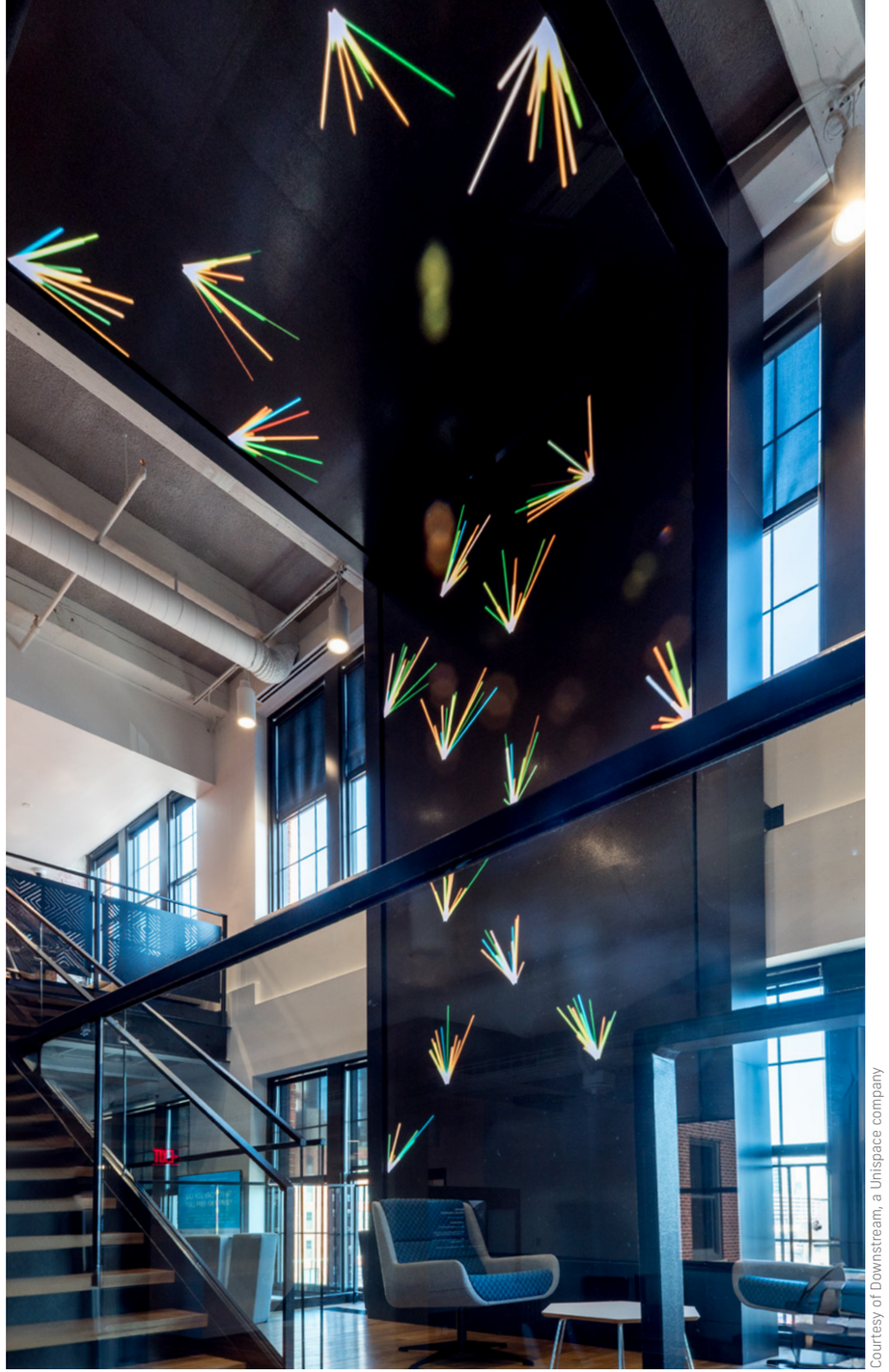
What motivates people to return to the office?

Employers and people who own and manage office space have been trying to answer that question for three years now. Many reasons factor into why employees may or may not choose to work from a central office, but one key reason is within your control—whether the office offers something people cannot get at home.

Three years after the COVID-19 pandemic began, most remote workers have hit a comfortable groove with work-from-home life. But there's no easy answer to providing the things home is missing—in-person collaboration, communication gaps between in-person and remote workers, and redundant technology that's not easy to scale down to one person's home. Smart integration of technology can support a workplace strategy that accommodates many different working styles and personality types, ultimately helping draw people back to the office.

TIPS FOR INTEGRATING TECH INTELLIGENTLY

Smart tech integration starts in the earliest planning stages, said Scott Spector, principal of Spectorgroup. Technology experts, such as your IT department or audiovisual consultants, need to be hired right away "because they actually dictate the aesthetic of the architecture that happens, along with what's needed from a technology support viewpoint," Spector explained. "We have to accommodate them within the overall design. We may have a client who wants a 100-inch screen in their conference room versus another



Courtesy of Downstream, a Unispace company

The Red Hat Executive Briefing Center emphasizes the importance of the customer community. The unique imprint of each visitor, which is collected through pre-registration and activated by sign-in, is stitched together to form a fabric representing the strength of collaboration. The installation connects levels 3 and 4 with a playful, artistic tone.

one who wants a 65-inch screen. All of those parameters need to be known during the schematic design process, not later on where it typically was years ago."

People need to know that when they make the journey into the office, they'll have seamless access to robust technology, added Regan Donoghue, senior principal of strategy for Unispace.

"When I think about technology, it's the experience," Donoghue said. "The number one frustration people have when they come into an office is the inability to connect with technology. It's also important that you don't embed it fully into the built environment because technology evolves … What I recommend is planning ahead for that. Plan ahead for flexibility and the user interface with the technology you choose."

TECHNOLOGY AND WORKPLACE CULTURE

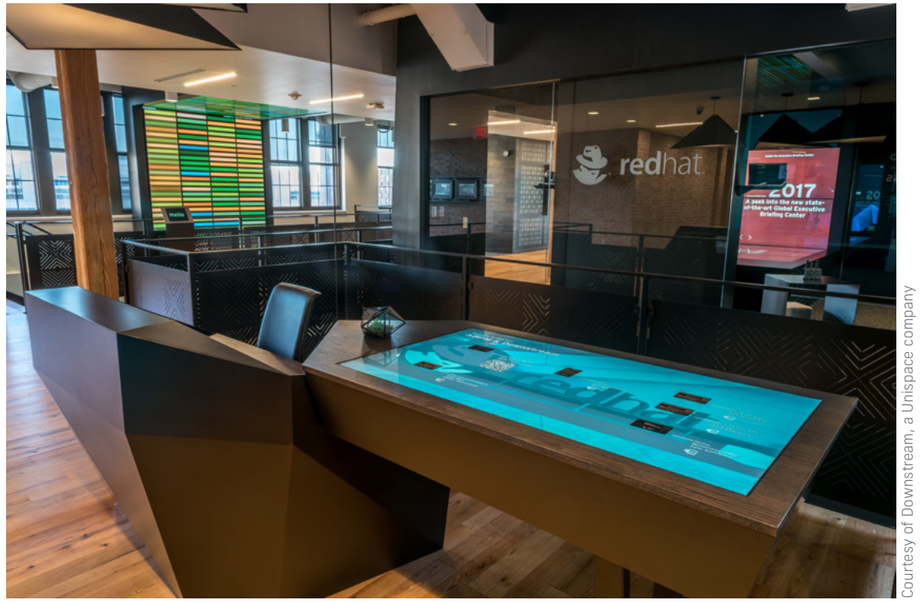
Integrated well, technology can enhance workplace culture—another aspect of the office that's not easily replicated at home. Think about how your use of technology reinforces the overall culture. What is your office saying about you to visitors and employees?

"You're letting people know 'We are invested in the future of work. We are committed to this,'" Donoghue said. "A lot of companies that choose not to invest in technology right now run the risk of looking antiquated. You run the risk of someone coming in and seeing those '90s desks."

Working from home offers the option of having control over your own environment, Donoghue added: "My Internet is working as fast as I want it. I can make calls if I want. I have the privacy I need. These are all the things companies are fighting against now—they're not fighting other companies, they're fighting the status quo of staying home, and we have a strong bias to not change."

To present a clear alternative to employees' homes, think about how your office offering can evolve. "People have technology at home that works for certain things, but they don't have the cool collaborative tech tools," Donoghue said. "We don't have digital whiteboards at home that are fun and integrative. Think about some of the really cool technologies out there that are more toward the future of work and that people are excited to engage with."

Spectorgroup's new headquarters on the 19th floor at 200 Madison Ave.



Courtesy of Downstream, a Unispace company

Red Hat's Solutions Ecosystem area is highly interactive. This multi-mode space allows visiting groups to dive deep into Red Hat's solutions and collaborate with subject matter experts remotely.

Reception at the Red Hat Executive Briefing Center in Boston centers around an embedded Multitaction table that allows for a seamless badging experience upon entry. Guests and visitors can be scheduled ahead of time or on the fly.

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Courtesy of Spectorgroup

Spectorgroup's new headquarters on the 19th floor at 200 Madison Ave. in New York City allowed the firm to reflect on its legacy, focus on its people, and redefine how they work. The company built its office on the need to create a destination within a new hybrid work model that encourages its team, clients, and visitors to come together and collaborate.

Spectorgroup's office offers flexibility for each team member's needs and work styles in the moment and the future.

in New York City makes carefully considered use of technology to create a cultural hub that empowers visitors and clients to connect with the firm. The office contains spaces of all sizes, from a large commons where people start their office experience to five sizes of conference rooms that accommodate varied sizes of gatherings. "If there's one person who walks into this office and complains that they don't have a place to go, I'd be shocked," Spector remarked.

FUTUREPROOF YOUR TECH SELECTIONS

Technology evolves so quickly that futureproofing may seem like an impossible concept. However, strategic design can accommodate both today's and tomorrow's tech without requiring drastic changes in the future. Spectorgroup recently completed a project with four 100-inch televisions fitted together.

"In the future, that could even expand, so you don't want to build them in. You don't want to create them with recessed spaces anymore," Spector said of the TV wall. Today's ultra-flat screens ensure that the screens lay on the wall without too much bulk behind them. "It needs to be designed as a flush look across the board, because it could be 100 inches one day, 65 inches the next day or a combination of 20 of them because a better TV came out. You have to be able to flip both ways."

Courtesy of Spectorgroup

Spectorgroup's virtual reality lab allows teams and clients to visualize, explore, and interact in conceptual spaces before they are built. The technology in the lab allows the firm to include clients in these experiences regardless of whether they can physically visit the office.

Hybrid workspaces may not have dedicated spaces for each employee, requiring scheduling technology. Spectorgroup uses Robin software to schedule its conference spaces. "We don't have kooky signs on our windows. We don't have touchpads that are obsolete in a year," Spector said. "It's software-based, and we manage that software. We also have displays on the desktop that say, 'This is Scott Spector's room from 10 to 11 a.m.' That's worked for us, and we've also introduced it to many of our clients."

Put yourself in the employees' shoes when you are looking at putting in new tech, whether it's hardware or software, Donoghue advised. "Take that journey yourself when you're looking at the product," she said. "Don't let the salesperson sell you on it. Go in and try to use it. Pretend you're an employee going in for the first time, the IT person is gone for the day, and you have to present. See if it works, and you can see if it makes sense for your company."

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Smart Buildings Require Smart Cybersecurity

It's time to adopt a mindset of zero trust.

by Jennie Morton

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Commercial facilities are an appealing target for cyberattacks for many reasons. It's time to step up cybersecurity practices.

Photo 127452233
© Funtap P | Dreamstime.com

Why are commercial facilities an appealing target for cyberattacks? While most businesses protect employee and financial data, they overlook a simple fact—every building system connected to the internet is at risk of being hacked. It's a massive opportunity for a bad actor to not only disrupt operations but endanger lives.

While cybersecurity practices may feel daunting, they're not a lost cause. Every precaution your organization implements fortifies the digital side of your building's footprint.

"Don't get overwhelmed—just start. Cybersecurity is a process you have to mature through," stressed Fred Gordy, director of OT risk assessment with Michael Baker International. "The goal is to be less vulnerable than you were yesterday."

WEAPONIZING COMMERCIAL BUILDINGS

Did you know that real estate is considered critical infrastructure by both the Department of Homeland Security and the Cybersecurity and Infrastructure Security Agency? One reason is that facilities are prime targets for a threat known as killware.

"Rather than a type of virus, killware attacks are meant to cause property damage, human harm and even deaths," Gordy explained. "It doesn't take much either. Boilers can be turned into bombs, lights turned off so people fall down stairs and electrical panels shorted to start fires."

"Most people can't imagine what could go wrong with a building if it were hacked. But if someone gets control of its operational systems, they can make it a dangerous place," added Jim McGlone, CTO of Automation Strategy & Performance, Inc. "For example, there was an attempted attack in 2021 of a water treatment plant—the goal was to poison the water by altering chemical levels. Private and public buildings are just as vulnerable to being weaponized."

How is this possible? First, many building systems are openly exposed on the internet with few security protections. IoT devices are a double-edged sword because everything is connected. By breaking through one point, the rest of the network is accessible.

Second, an interface or direct communication between building and corporate systems is a massive risk. A bad actor may not care about HVAC, but your mechanicals could be an attractive portal if they provide a connection to enterprise data.

The good news is that the principles of physical security—creating layers of barriers—is the same for cybersecurity. These safeguards will thwart someone from penetrating your systems and data. Lock down where building controls interact with your electronic perimeter.

"Because bad guys will troll your digital neighborhood, cybersecurity is no different than physically hardening your building to send the message 'We're protected,'" Gordy stressed.

5 CYBERSECURITY PROTOCOLS FOR FM

There are entire books devoted to cybersecurity best practices. Your IT department should also be a robust partner in this effort. You can implement ISA/IEC 62443, a series of cybersecurity standards for automation and control systems. Follow the basics of changing passwords, be suspicious of links or attachments, perform weekly backups and control remote access. But nothing will ever be accomplished without an attitude shift first. Cybersecurity begins as a mindset more than anything.

1) IMPLEMENT SERVER PROTOCOLS

"Treat every computer that runs building controls like a server," emphasized Gordy. "Don't use those devices for direct internet access either. They should be locked up as well."

2) CHECK WHAT'S EXPOSED

"You'd be amazing at what's unprotected. How far does the Wi-Fi extend outside of your building? Do you have unused ethernet jacks that are still active? Who has access to your IT closet?" asked McGlone.

3) UPDATE YOUR DEVICE INVENTORY

"Know what you have, how it's connected and who has access. If you don't have an accurate network diagram, you can't keep the boundaries safe," said Gordy.

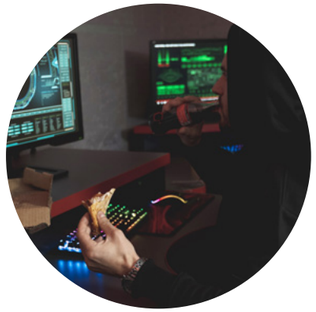
4) ISOLATE BUILDING SYSTEMS

"Create a DMZ network to isolate operational technology, which is a type of segmentation that only allows specific traffic with certain permissions," McGlone recommended.

5) SCREEN EVERYONE

"Adopt a zero-trust policy, which means 'Never trust, always verify,'" says McGlone. "This is critical for any visitors and vendors bringing their own device. Start screening everyone as if your facility were as important as a power plant."

UNDERSTAND CYBERCRIMINALS



Tima Miroshnichenko / Pexels

Imagine all hackers like this photo? The truth is much more sophisticated. While there are mischief makers who enjoy the fun of it, cybercriminals often have darker motivations. There are nation-states whose sole motivation is to disrupt, disillusion and demoralize a country. Those engaging in corporate espionage can seriously damage a brand. Many are simply chasing money, leaving a wake of chaos in their pursuit.

"Those in it for profit are both the laziest and most persistent people in the world. They're looking for the path of least resistance," according to Fred Gordy, director of OT Risk Assessment with Michael Baker International. "If they send out 100,000 ransomware emails with a $10,000 decryption key and 1% are success, the takings are huge."

HOW COMMERCIAL BUILDINGS CAN BE WEAPONIZED

It doesn't take a sophisticated attack to cause mayhem in a commercial building, but it can easily have malicious outcomes.

HOSPITALS

Imagine a 20-story hospital with 1,000 IoT devices on every floor—that's 20,000 potential points of intrusion. Just turning off the lights or removing positive pressure could be catastrophic.

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ADVANCE TO TOPICS

Checklist for Smart Building Success from Facilities Expert Kenny Seeton

by Wanda Lau

CSUDH Innovation and Instruction building, designed by HGA

Matt Brown, California State University, Dominguez Hills

In the past three years, Kenny Seeton has overseen a 50% reduction in greenhouse gases at California State University, Dominguez Hills (CSUDH). During that same period, the campus added 300,000 square feet of new construction, for a total floor area of 1.5 million square feet. Not surprisingly, CSUDH's director of central plant operations and strategic energy projects spends his days monitoring building automation systems and his nights ideating ways to eke out more percentage points of efficiency. A regular speaker on facilities management and smart building technologies at national, regional, and campus events, Seeton shares his tried-and-true recommendations for owners and operators looking to save on energy.

IN THE PAST THREE YEARS, KENNY SEETON HAS OVERSEEN A 50% REDUCTION IN GREENHOUSE GASES AT CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS (CSUDH).

WHAT IS POSSIBLE TODAY WHEN A BUILDING OR CAMPUS IS SMART?

Seeton: This sounds simple, but what is possible is that we stop heating, cooling, lighting, and wasting energy on spaces that don't have people. We have all these multistory buildings that run like they have always run: chiller on at 6 a.m. for occupancy at 7 or 8 a.m.; off at 5, 8, or 10 p.m. But with the controls we have now, we can shut things off when nobody's inside a space. We have sensors that tell us what the CO_2 levels are. We can do a minimum flush where we push air through the building and say, "OK, you're safe now."

The sensors aren't that complicated anymore. As you add these devices, make sure they're able to work with your building automation system (BAS): You need an up-to-date BAS if you want the huge savings. If you're worried about complaints from occupants, then override everything to be super cold or super warm and call it a day—and that's how we used to do things. But to reduce our impact on the environment, we have to do more. It will take more work, but there are tools to help us, such as smart building analytics with fault detection diagnostics.

The basics have been around long enough to where we should be able to fix things. And soon you'll begin to ask, "What else can I do?"

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Loker Student Union, California State University, Dominguez Hills, by CannonDesign

Matt Brown, California State University, Dominguez Hills

HOW HAS AI AFFECTED YOUR OPERATIONS?

Seeton: AI can do things that we can't because we are biased. We think we're supposed to do things a certain way. And we don't have the time to analyze all that operations data—and the data is always changing. With AI, we can make tweaks, have it take snapshots, go back, and analyze the results. AI can say, "When you are at this condition, this condition, and this condition, this is the right place to run things."

I recently used AI for a cooling tower reset. For running one chiller, it said we should be at wet bulb temperature plus 2.5 plus tonnage times 0.00987 or something. I don't know how it came up with these numbers, but I saw that my average kilowatt per ton is better now than before. And the analytics showed that while we increased cooling 3% year over year, we saved 7% in energy.

We're still in the learning phase, but we will start asking AI for more. Running a building is complicated. You can make adjustments and then wonder, "Did it help me or not?" Maybe other parameters kicked in that you didn't know about. AI can look at all these different points—but the average person can't.

Here's another use for AI. Every device I've put in talks through BACnet to my BAS—but what if people haven't done that and information is scattered in different parts of the cloud? AI can aggregate the data, analyze it, and then write back to just the BAS. Instead of spending money to completely replace stranded assets, people can spend money on the AI and keep things in place that are good at what they do.

WHAT STEPS OR ACTIONS SHOULD A BUILDING OWNER OR FACILITIES DIRECTOR TAKE TO MOVE TOWARD THEIR SUSTAINABILITY AND ENERGY GOALS TODAY?

Seeton: You have to install meters. If you don't meter your systems, you can't prove the savings. You need to solidify that what you're doing is the right thing. You need to get the message out.

If you're still running buildings on pneumatic controls, you need to come up with a five-year plan to get rid of them. It doesn't have to be all at once. When my buildings went from pneumatic to direct digital control and had lighting and occupancy information feeding into the BAS, they used 50% less energy. Toss solar panels on top of them, and we drop it down more. Find a 250-kW battery and voilà, the buildings can almost become net-zero.

Install occupancy-based controls. You have to be able to control what gets heating and cooling based on when there's people there. You may have to come up with $1 million upfront, depending on the building size. But how much money does the building cost you to run every year? You'll save 30% to 50% easily. Electric rates are not going down.

I CAN DO THINGS THAT WE CAN'T BECAUSE WE ARE BIASED. WE THINK WE'RE SUPPOSED TO DO THINGS A CERTAIN WAY. AND WE DON'T HAVE THE TIME TO ANALYZE ALL THAT OPERATIONS DATA—AND THE DATA IS ALWAYS CHANGING. WITH AI, WE CAN MAKE TWEAKS, HAVE IT TAKE SNAPSHOTS, GO BACK, AND ANALYZE THE RESULTS.

And take advantage of solar. You can get help from the Inflation Reduction Act (IRA) and still have a power purchase agreement with somebody, which should bring your rates down. Many contracts lock in rates and promise no inflation.

Switching everything to LEDs is a no-brainer now. With the IRA money, people need to step up. And if you can't do it yourself, then reach out to somebody that can help with the paperwork and the project management. There are companies out there. They may take half of your IRA refund, but you will get the project done and get the benefits of the energy savings forever after.

If you're running a facility and you have a team, share the vision with the team. They need to know what you're doing and why. After 10 years of speaking engagements, I finally presented to my own department—to my team and the facilities controls specialist who does the crazy implementations I request. Afterward, he said, "Oh, my God, Ken, we can do better." Keeping the people around you motivated helps because this is bigger than one person can do.

Photo 322635274 © BiancoBlue | Dreamstime.com

Finally, build relationships. If you're working on a large campus or building, you're typically not the one who gets to make all the decisions. How do you get things done right? Maybe that means you buy coffee for the director of procurement. Become friends with the IT department because you can't do anything without IT onboard now. If you plug something into the IT network, and their job is to protect the campus, they see you as a threat. Have conversations with them. Buying them lunch is cheap compared to them shutting down one of your projects.

Build relationships with everyone. Your peers, your utility company because they can do things to make your life easier, and people who have publications like this. Because someone might read this and say, "Hey, Kenny is doing cool stuff over at CSUDH. We have a widget that can save his campus money."

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ADVANCE TO TOPICS

Meet 17xM, North America's First SmartScore-certified Building

Anticipating completion in early 2024, 17xM in Washington, D.C., is the first building to earn SmartScore certification in North America.

Ccourtesy of Skanska

Sited on prime real estate in Washington, D.C., the 11-story, 334,000-square-foot officer tower developed and owned by Skanska was more than half leased before its completion.

by Jeff Link

The traditional approach to commercial office development in an urban center conjures the premonition of farmer Ray Kinsella, played by actor Kevin Costner, in the 1989 film *Field of Dreams*: "If you build it, he will come." In the film, Kinsella's conviction—that plowing his Iowa cornfield to create a baseball field will draw the ghosts of legendary players and save the farm—proves prescient.

Of course, life rarely unfolds like a movie, especially one with ghosts. In Washington, D.C., like many highly competitive real estate markets, simply

"building it" is no longer enough to attract multiyear tenants or the top-performing knowledge workers who populate their ranks, says Brad Mason, vice president of commercial development at global development and construction firm Skanska.

Even before the pandemic, wooing top law firms or lobbying groups to the District's central business corridor required more than the promise of a good location and tall windows. Prospective tenants wanted concierge-level services, integrated technology, enhanced privacy and security, and an emphasis on well-being and sustainability.

Skanska was already aware of the heightened expectations of the newly empowered professional class back in 2019, when it purchased an available parcel from JBG Smith just blocks from the White House and Dupont Circle. On the formerly vacant site at 1700 M St. NW, where a previous owner had demolished two office buildings, Skanska along with project designers Kohn Pedersen Fox (KPF), Siemens, and Arup envisioned a new kind of building.

"We recognized that the glass box, as designed, was not going to work for this site," Mason says. "We [needed] to give up a little bit of density, but we needed to do it in a very smart way."

OFFICE BUILDINGS ARE BEING HELD TO A MUCH HIGHER STANDARD THAN THEY WERE BEFORE COVID. AND SO THIS BUILDING IS GOING TO HELP … ATTRACT AND RETAIN WORKERS—HIGH-PAID WORKERS.

The end result is 17xM, an 11-story smart office tower, scheduled for completion in early 2024. Targeting LEED Gold and Fitwel certifications, the building has already achieved WiredScore Platinum certification by its eponymous New York–based certifying agency. Notably, it is also the first office building in North America to achieve certification by SmartScore, a fee-based building standard developed by WiredScore (buildings can be certified prior to completion up to 18 months after occupancy, whereupon their design and operation are reassessed).

When complete, the 334,000-square-foot building will be visually provocative, featuring the largest exterior green wall in D.C. and an articulated facade with 8-foot-tall insulating glass windows and a champagne-bronze curtain wall that transitions to recessed cedar wood

Courtesy of Skanska

The third floor terrace at 17xM will feature what is billed as the District's largest exterior green wall.

frames inset with oak panels at the 17th Street entrance. Arguably, the most unconventional aspects of the project are inside. A robust network of smart technologies—including occupancy-based HVAC and lighting controls, environmental sensors, fault detection and diagnostic software, and an automated building management system (BMS) by Siemens called Desigo CC—are intended to keep tenants happy and comfortable while alerting operators to energy usage and predictive maintenance needs.

Guided by SmartScore, 17xM's design approach emphasized user functionality and technological infrastructure, the core elements of the SmartScore scorecard, says Will Brouwer, a product manager at WiredScore. The point-based standard allows owners to pursue certification at four progressively stringent levels (Certified, Silver, Gold, and Platinum). 17xM achieved a Gold rating, a distinction Brouwer attributes to a strong technology team that incorporated smart technology into the project early on and kept an eye on how it would serve tenants.

"The concept is you're designing for who your customers are," Mason says. "What is the work experience? What is the entry sequence? How do people arrive at the building?"

AN INSIDE-OUT DESIGN BEGINS WITH THE TENANT EXPERIENCE

Spatially, the driving impulse behind 17xM's so-called "inside-out" design was a desire for the building to democratize the work environment, says Kahlil Francis, a development associate at Skanska. During the project's three-month project design competition, Skanska called on multiple architecture firms to develop conceptual building layouts. KPF's winning concept, a K-shaped design with flexible floor plates from 10,000 to 80,000 square feet, aims to increase the number of perimeter offices per floor and ensure that natural light reaches inside the core.

"We're going away from the historic norm where you might have five or six sizes of offices, and it was always about who was the big rainmaker, who was going to get the corner office, the double-sized office," Mason says.

Not only are the floor plans more egalitarian than what might be found in a typical office building, Francis says, but the design process was also more collaborative. Early on, the design team invited the executive team and summer interns of international law firm and future anchor tenant Gibson Dunn into visioning sessions. In one role-playing exercise, stakeholders assumed the identities of potential tenants—attorneys, urban planners, hospitality workers, lobbyists—with the goal of customizing the design to suit their perceived needs.

Chris Taylor, a locally based associate at Arup, says these workshops and planning sessions—key to developing a program to support SmartScore certification—led to insights about the evolving relationship between space and technology. For example, the ongoing digitization of case files at Gibson Dunn eliminated the need for a massive law library. That space could then be utilized for conference rooms, amenity areas, or cut-out staircases to create double-height ceilings and terraced overlooks bridging the third and fourth floors, and the ninth and 10th floors.

Participants also discussed the appeal of a space that is adaptable to the changing needs of tenants, which can be driven by both economic conditions and generational shifts in workforce, Mason continues. The top firms want the top talent out of the top law schools, he says, and part of how they attract them is with their physical space.

THE BUILDING WITH A BRAIN

At the heart of 17xM is Siemens' Desigo CC, an integrated BMS that pulls together data from HVAC and lighting systems, IoT sensors, dynamic 3D building maps, energy meters, and life safety alarm and security systems. Christopher Smith, an account executive in Siemens' D.C. office, says building engineers typically use Desigo CC in a limited capacity, as a graphical user interface to monitor and control HVAC systems. In this project, however, the system's interoperability with IoT devices will allow it to serve a more prominent role as the digital nerve center for 17xM's entire building.

Desigo CC communicates wirelessly via the open BACnet protocol with an IoT-enabled network of more than 100 Enlighted sensors, says Michael White, director of national business development and a senior engineering technologist at Siemens, which owns Enlighted. The sensors, which are hardwired for power to dimmable LED fixtures, can detect room usage and occupancy flow patterns, energy consumption, ambient light, and environmental conditions. Desigo CC then uses collected data to adjust

Courtesy of Skanska

Lobby, 17xM

light, airflow, and temperature levels dynamically based on algorithms established by facilities managers.

While lobbies and hallways are typically preset to binary on/off conditions, designated zones and rooms—such as a shared conference room in the 12th floor penthouse—can be controlled on a more granular level. They can, for example, precondition app-reserved spaces to the desired environmental conditions calibrated to the expected number of occupants. If a user says, "I want to use the conference room at noon, and I'm going to have 50 people in there," Smith explains, "the building automation system knows, 'OK, I need to actually start throwing some cold air into this space around 11:30 a.m.'"

The Enlighted sensors at 17xM will, in effect, work double duty. Their core function is controlling the lights, "but they're also providing [occupancy] data to us and ultimately, the owner of the building," Smith explains. "At the end of the day, we want to tell [Skanska] if their investment in amenity areas was a good investment or not. If no one's using [the amenity spaces] or more people than they anticipated are using them, it can drive a decision on how to modify this building or future buildings."

courtesy of Skanska

Through smart access technologies, credentialed visitors can enter through 17xM's rear, porte-cochere entrance.

Another benefit of the Desigo CC system, White says, is that the data it stores can be shared with a fault detection and diagnostic system—part of the Siemens' Building X platform—to alert owners of early-stage problems in building systems before they become costly or dangerous. Similar software used in other buildings, WiredScore's Brouwer says, has led to a 20% to 40% reduction in energy and maintenance costs through extended equipment lifespan and performance.

With 12,000 square feet of publicly accessible, first-floor retail space, 17xM also has to ensure the privacy and security of its upper-floor tenants, Smith says. A Bluetooth-enabled mobile app by the Italian software company Synapses called BlueGPS will link to a broader access control system and help manage circulation and use of shared spaces. Credentialed users with BlueGPS installed on their smartphones will be able to book rooms, order food, summon destination dispatch elevators, and gain touchless access to turnstile-secured areas managed by the Siemens SiPass system.

Privileged clients can even enter the building through a porte-cochere entrance in the rear of the building. "Let's say the law firm has that VIP client that's flying in from New York," Mason says. "They can assure [the client will be] getting ushered into a black car at Reagan National [Airport]. We can geolocate this location and send them to the back of the building. So it's very discreet, it's very bespoke."

Ultimately, the team wants to make the occupant entry sequence as touchless and convenient as possible, Mason says. "So we're investigating ways in which we can reduce the number of fobs and cards that you have to carry around."

EARLY HALLMARK OF SUCCESS

Achieving SmartScore certification is rigorous. Skanska's evidence filings, including architectural drawings, solution-provider screenshots, and photographs for each scorecard criteria, totaled more than 300 pages. But the submission process is getting easier, according to Brouwer, thanks to WiredScore's growing accredited professional network. And the SmartScore standard appears to be gaining traction among developers trying to lure companies—and their employees—back to ailing downtown districts with the promise of exceptional tenant offerings. "We're definitely receiving increased interest in [SmartScore] up and down the Northeast coast," Taylor says.

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Roof terrace at Washington, D.C.'s forthcoming 17xM, owned and constructed by Skanska.

Courtesy of Skanska

Rare for a speculative office project, 17xM was 50% leased before it broke ground in November 2021. Gibson Dunn signed on to a 16-year commitment for more than half of the office space prior to construction. In April 2023, the global wealth management firm UBS signed a 12-year lease for 23,466 square feet.

The building will help tenants solve two significant challenges, Siemens' White envisions: "ESG and getting people into the building and attracting talent. … Office buildings are being held to a much higher standard than they were before COVID. And so this building is going to help … attract and retain workers—high-paid workers."

One reason Skanska was able to secure commitments from its anchor tenants, Mason says, is that 17xM was largely built to suit their needs in the aforementioned co-creative design approach that was, until recently, rare for commercial office projects.

"In a traditional build, you have your MEP, your architecture firm, these different teams, and there'll be a lot of tension," Brouwer says. "Everyone has a different kind of vision. Where certifications—not just SmartScore—generally help is aligning people on a common vision to deliver that best in class asset."

For all the purported benefits of smart buildings, the fact that 17xM is the first SmartScore–certified office building in North America says something about the challenges implicit in designing and developing buildings to such benchmarks. The standard is young, with its first scorecard launched in April 2021 and SmartScore version 2 now applicable to all building submissions; its advocates have a long way to go to convince building owners and tenants of its value.

"It really is, at the moment, still about enabling leasing teams to offer supply-side differentiators," Brouwer says. These include improved comfort and convenient building access, as opposed to resiliency and performance, "which are more tangible to tenants in LEED and the WELL Building Standard."

Yet, if 17xM continues to attract tenants successfully and lives up to its promises for operational efficiency, it could become a model for developers and building engineers in the Mid-Atlantic region and beyond. "We've talked about this for 2.5 years," Smith says, "and these next four months are crucial as to whether we'll be able to recreate this strategy in this region and around the country."

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The Smartest Building in Austin

Take a tour of RiverSouth, the new workspace where the design team pushed boundaries on automation to maximize delivered benefits.

By Jeff Pitts


Courtesy Casey Dunn

RiverSouth is the first major project within the new South Central Waterfront District of Austin, Texas. The Beck Group led the architecture, design, and construction of the 15-floor office building, and the team set the bar high for future development.

The aim was to create a structure with world-class smart technology that was also sustainable and offered its occupants superior connectivity with the city, including pedestrian-friendly streetscapes, integrated onsite protected bike lanes, and generous walkways with native plantings.

Now finished, the structure consists of 350,000 sq. ft. of Class AA office space, including 20,000 sq. ft. of ground-level retail and restaurant space, plus a five-level, below-grade parking garage. The LEED Gold project has also earned a SmartScore Platinum certification and RiverSouth is being hailed as the "smartest" building in the city.

The project designer—Andy Kennedy, AIA, Associate Principal at The Beck Group—recently dished to *Architectural Products* magazine about his team's success in the Lone Star State.

HIGH IQ

The bulk of the building's high-tech framework functions behind the scenes, according to Kennedy. The idea was to create a fiber backbone within the structure's shell—an infrastructure capable of connecting all future smart devices.

Sensors—approximately 6,000 of them—are attached to the spine. These connect to an automation system that helps maintain and control air quality, HVAC, lighting and security. They also allow ownership and management to understand how people move within the structure and how the various spaces get utilized, such as conference rooms and parking. This data, along with the building's integrated technology allows for optimization of the user's experience and a highly personalized and responsive environment for comfort, health, and security. Management can do level-specific occupancy counting, for instance, as well as leak detection, the monitoring of energy use, and it can create and manage work orders.

Designed to be completely touchless from the time a person pulls into the parking garage until arriving at the individual's desk, RiverSouth is loaded with 21st-century user-friendly advantages that are already operational: touchless elevators, two huge digital walls, a digital concierge, smart conference room scheduling and monitoring and adjustable lighting—to name a few.

Tenants at RiverSouth can utilize their own KODE dashboard to create an individualized schedule for temperature control set points in their spaces. They can also use the tenant application on mobile devices for access control to the building and parking garage, booking common spaces for

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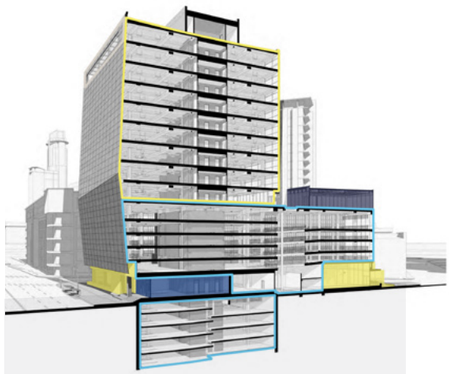

A SMART DAY AT RIVERSOUTH

7:00 a.m.
Upon arrival at the parking garage entrance, the sophisticated security sensors detect your mobile device and then, after confirming your identity via license plate recognition cameras, the gate automatically opens. Two monitors in the drive-through give real-time data on the on-site parking capacity and wayfinding for visitors in the parking garages.
7:15 a.m.
It's time to open the RiverSouth app and select which floor the elevator will take you to from the elevator dispatch software.
7:16 a.m.
While you have the RiverSouth app open, order from the onsite coffee shop.
8:00 a.m.
Arrive at your desk to find that your preferred lighting settings and temperature controls have been automatically adjusted.
Noon
Work up an appetite at the fitness studio. Then, enjoy lunch at the ground-floor eatery.
2:00 p.m.
Time for a meeting in the conference room—ideal climate controls are in place based on occupancy levels.
5:00 p.m.
Happy hour! Reserve a table for you and a couple of clients at the Sky Lounge with the RiverSouth app—enjoy downtown views of the city from the 15th floor while sipping a cocktail.
6:30 p.m.
As you return to your workspace to wrap up the day, the smart building knows to switch off the energy-conservation mode and return to your customized settings.

meetings, ordering from the Sky Lounge, booking fitness classes in the fitness center—or checking how busy it is before a workout—and also for receiving notifications about nearby events. "You have this whole building application suite," says Kennedy, "that allows you to experience all of the amenities in a seamless way that's more experiential and hospitality-driven and less office-driven."

SMART SOLUTIONS TO SITE ISSUES

The plot's shape and location presented significant and varied challenges. Situated near a lake and in a flood plain with a high water table, the triangular site is surrounded by three major pedestrian and vehicular thoroughfares in the heart of Austin.

Early in the project's planning stages, the team considered submerging only two levels below grade. Going down further was preferable, but, according to Kennedy, retention was difficult to manage, plus the soil conditions were less than favorable and the proximity to groundwater was an issue.
"DWG was our partner landscape architecture firm," Kennedy continues. "They used a GeoGrid product so that they could plant these faceted slope forms. It allowed us to not have to put railings all over, but to also raise the building high enough so that we were out of the flood surge plain." The landscape design resulted in a park-like ambiance. The building's ground floor now features outdoor seating and retail.

But that wasn't the only smart solution to a hard problem regarding the terrain. The building's below-grade structural diaphragm wall solved the retention difficulty. This allowed RiverSouth to submerge five floors below grade, instead of two.

"That was a project game-changer," says Kennedy.

The diaphragm wall, installed by Hayward Baker, anchored into the limestone layer underneath and ultimately helped with retention and water cut-off. The improvement meant 40% more underground parking and allowed an additional 40,000 sq. ft. of rentable above-grade office space.

"That increased our rentable square footage by a large margin," informs Kennedy. "Because we were hemmed in by a height cap, pushing all that parking down allowed us to get a couple more floors of office. …
It was a huge win."

Smart building technology delivers more value to building owners and people in the space through reduced void space, increased retention, and an exceptional user experience.

In the "smartest building in Austin," tenants at RiverSouth experience a sustainable and fine-tuned environment. The sophisticated safety technology provides a touchless path throughout the building, as well as density, capacity, and health monitoring sensors, UV sanitation, and more. The high IQ of RiverSouth makes the day-to-day operation of the building and the work-life of the employees inside it easier and more enjoyable. It's so smart, it makes everything seem simple.

OPERATIONS

RiverSouth's operating system Kode Labs (Detroit), KODE's Smart Building OS - Operating System (kodelabs.com) enables seamless communication between the building managers and occupants. It also enables easy coordination and integration of 20-plus complex systems—including HVAC, lighting, and security—while minimizing energy consumption and compiling data from at least 1,100 pieces of equipment into a common single pane of glass for a host. This data is then used for predictive maintenance, optimizing energy performance and for improving the experience of occupants and guests.

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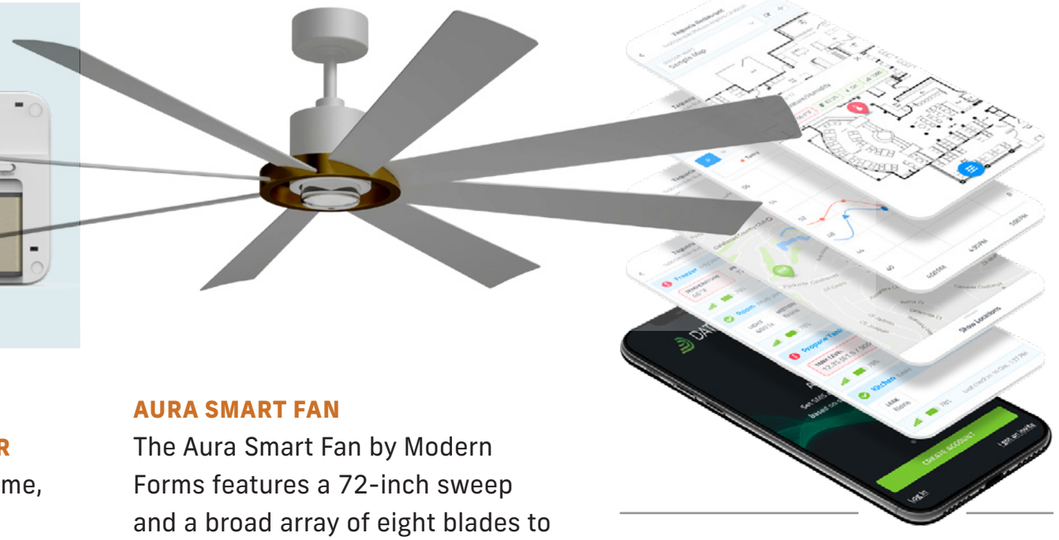
SV ENSEDGE MINI INDOOR AIR QUALITY MONITOR

Monitoring air quality in real-time, the Sensedge Mini is the new commercial air quality monitor with a thinner, lighter, screenless design. It blends in anywhere to track the levels of key air pollutants and environmental parameters. The product is RESET certified, and the customizable modules offer an unobtrusive design to blend into an array of environments. This HVAC solution aligns with WELL criteria in a several concepts including Air, Thermal Comfort, and Materials.

kaiterra.com



AURA SMART FAN

The Aura Smart Fan by Modern Forms features a 72-inch sweep and a broad array of eight blades to transport swiftly moving air across a room. Each blade is engineered with a subtle curve to push a relaxed, comfortable breeze down over the room. A remote control will commission one of its six speeds and drive the engine of comfort into any hospitality or commercial space.

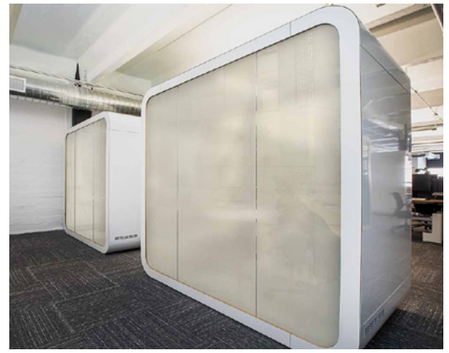
The quiet DC motor runs 70% more efficiently than traditional AC motors. Its versatile and distinctive design makes Aura appear to float melodically in the sky. Choose from three two-tone finish combinations. Wet rated for both indoors and out.

modernforms.com

SMART WATER METER

The Clamp-on Ultrasonic Meter by Chelepis mounts in 60 seconds without interrupting your tenants or processes. Can be installed on any pipe from 0.25 to 8 inches, including iron, copper, stainless steel, rigid plastic, PVC, hose, tube or high-pressure hose. Pair it with the Data Harbor App, which gives users full visual control over meter data. Upload site maps with meter locations and quickly add information and view historical or current water usage. Manages one or hundreds of locations.

chelepis.com



SMART GLASS COUNTRY

Smart glass contains a switchable PDLC layer that alters light transmission. This enables the glass to change from clear to private on demand. Any type of glass can be made switchable whether it is triple glazed, an insulated glass unit, curved smart glass, or low iron smart glass. Smart glass can be used on operable glass windows, walls and doors with innovative wiring solutions for sliding doors and retractable glass walls.

smartglasscountry.com

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KESMOBILE

KESMobile is a cloud-based service productivity tool that provides service providers with enhanced real-time data access for fire and life safety systems, allowing them to optimize the management of individual systems, sites and site groups. Data helps inform decision-making and resource optimization. Insights are accessible remotely and on-site within a single intuitive dashboard Remote diagnostics and system analytics streamline troubleshooting, and comprehensive panel history access makes compliance reporting easy. Service providers stay fully informed about the real-time status of their fire and life safety systems, enabling proactive, well-informed resource planning and service scheduling.

kidde-esfire.com

SMART FIXTURE MOUNT SENSORS

Leviton's Smart Fixture Mount Sensors for high bay, parking structure and outdoor lighting applications install directly into high-bay and low-bay luminaires to provide integrated occupancy sensing, dimming, daylight harvesting and scheduling, helping meet the most stringent energy code requirements. The in-fixture controls are fully configurable using the Smart Sensor App, which enables the sensors to be configured in real-time without climbing ladders. Available in two mounting options, internal and external or end-mount, and are designed for use with switching or 0-10V dimming drivers. Both internal and external mount options are available in 120-277VAC and universal 120-347VAC for single pole applications and 208-480VAC for two-pole applications.

leviton.com

SERIES E-90E SMART PUMP

Bell & Gossett's Series e-90E Smart Pump combines the e-90 pump series with the Xylem Smart Motor, an IE5 permanent magnet motor with built-in pump protection controls and monitoring to optimize operations and increase energy savings up to 70% over fixed speed models. The combination allows for easy, cost-effective installation and features the intelligence and performance of a pre-configured system. The pump, motor and variable speed drive are combined to eliminate the need for separate components. Available in 12 combinations of high RPM models, the e-90E is flexible enough to use across various applications, including industrial, HVAC and water boosting.

bellgossett.com

SOLARVOLT BUILDING INTEGRATED PHOTOVOLTAIC (BIPV) GLASS

The 2023 PIA-winning Solarvolt glass modules combine the aesthetics and performance of Vitro Glass products with CO_2-free power generation and protection from the elements. Solarvolt BIPV modules can enhance various components of commercial building exteriors, including balustrades and balconies, overhead glazing and skylights, facades and opacified spandrel glass—all while passively generating solar power, reducing air conditioning costs, and even replacing conventional cladding materials.

vitroglazings.com

SMART PACKAGE ROOM

Smart Package Room is a self-serve package management solution that offers traceability, flexibility, security and 24/7 pickup. Unlike lockers, Smart Package Room is an elegant solution that conforms to any room size, providing secure access for couriers and residents while sophisticated computer vision technology monitors packages until the owner retrieves them. It can include cold storage for perishable food items and convenient spaces for dry cleaning drop-off. The automated system receives, secures and checks out packages, allowing concierges the freedom to perform undistracted high-touch services for residents.

smartpackageroom.com

PORT TECHNOLOGY

Armed with an advanced algorithm that helps elevators be strategically assigned to riders, passengers select a destination floor while calling for the elevator and before getting on. Then PORT groups passengers by destination to provide the shortest possible trip more frequently and provide fewer chaotic elevator runs with multiple stops. Optimizing a building's traffic flow for efficiency is the aim of Schindler's PORT Technology.

www.us.schindler.com

MOBILE SMART LOCKER

The Mobile Smart Locker from Hollman is designed for agile and flexible work environments where space is at a premium. This functional piece of furniture features a two-way glide system for easy roll out to serve as a collaborative workstation and rolls back into the wall to save space when not in use. It's available with a portable charger and a charging stand, or with a wired solution.

hollman.com

KOVA COMFORT

KOVA Comfort is an AI-powered HVAC system that seamlessly integrates into building projects to create healthier, more comfortable environments based on a variety of inputs. It leverages behavioral, environmental and unit-specific occupancy inputs to learn, personalize and optimize comfort and energy usage in each environment. While traditional HVAC systems are prone to inefficient downtime and excessive energy use, KOVA Comfort significantly minimizes the energy needed to meet heating or cooling loads by combining existing energy efficiency capacities with AI and a variable-speed compressor and fan. Ideal for multifamily, student housing and hospitality applications.

kovaproducts.com

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GETTING TO NET ZERO: CARBON SOLUTIONS FOR TODAY'S CLIMATE CHALLENGES
This eHandbook on decarbonization offers building and design practitioners with practical and valuable content to help them meet their sustainability goals. Inside, you'll find information on how to calculate the carbon footprint of your interior renovations, as well as how to reduce that impact through smart product specification. It also offers several cost-effective strategies to help you achieve your sustainability target, as well as present a regenerative framework for tackling the climate crisis.
Download Now

UNIVERSAL DESIGN: ACCESSIBILITY FOR EVERYONE IN EVERY SPACE
Universal Design and accessibility in commercial buildings are essential for fostering inclusivity for individuals of all abilities. Adhering to these principles not only ensures compliance with regulations but also demonstrates a commitment to social responsibility. By accommodating people with disabilities, businesses can expand their customer base and enhance their reputation. This eHandbook offers practical articles and valuable resources to help create environments that are accessible, inclusive, and adaptable for everyone, regardless of age. Inside, you'll find guidance on designing inclusive spaces for neurodiverse populations, tips for avoiding common ADA compliance mistakes, and a comprehensive checklist for handling ADA complaints. Additionally, we provide case studies showcasing real-world applications.
Download Now

A COMPREHENSIVE GUIDE TO INDOOR AIR QUALITY
Indoor air quality has always been of vital importance, but never has it demanded more attention from architects, designers, building owners and facility managers than it does today in the wake of a global pandemic. This eHandbook offers the most up-to-date information available on the subject.
Download Now

FUTURE PROOFING YOUR BUILDING: WHERE HVAC AND SUSTAINABILITY COME TOGETHER
Variable refrigerant flow (VRF) zoning systems solve many of the challenges associated with commercial construction and facility management. It's time to ask yourself: is VRF right for my facility?
Download Now

THE IMPORTANCE OF ACOUSTICS IN THE BUILT ENVIRONMENT
Every design choice impacts acoustic quality, and noise levels in a room can impact health, concentration and productivity—just ask anyone who's worked in an open office before. This eHandbook will help you better understand the fundamentals of how acoustics work in buildings, identify ways to improve acoustics and make the connection between acoustics and wellness clearer.
Download Now

REDEFINED & REDESIGNED: HOSPITALITY SPACES IN THE COVID ERA
In this eHandbook, we look at the evolution of hotels into streamlined, touchless experiences with stringent cleaning practices. We also explore how meeting and event spaces have changed during the pandemic, repurposing guest rooms as temporary office space, and the "staycation"trend that may be here to stay.
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WELLNESS: THE FUTURE OF BUILDING DESIGN, CONSTRUCTION AND OPERATIONS
This new eHandbook gathers tips and strategies from leading design professionals and building owners on how to make sure your building is fostering wellness.
Download Now

SHORT- AND LONG-TERM STRATEGIES FOR HEALTHCARE DESIGN AND OPERATIONS
While we understand more about COVID-19 today than at the outset of the pandemic, it will continue to reshape the way medical facilities are designed and operated. We assembled this eHandbook: to offer guidance from trusted sources to help hospital staff and designers alike with the decisions they need to make today—and tomorrow.
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REOPENING THE OFFICE BEST PRACTICES
In this eBook, we've assembled a preview of numerous guidelines and white papers with practical information on getting your workplace ready for reopening from some of the most respected organizations and architectural firms, including direct links to download the complete reports.
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