



ARE SMART BUILDINGS SMART FOR BUSINESS?

White paper | 2016



Imagine a world that knows what you *need* and what you *like*.

You wake up in the morning, and your thermostat has already warmed the room to the perfect temperature. With a tap on your smartwatch, the blinds raise before your feet hit the floor. Another tap preheats the oven while you get dressed, so it's ready to bake breakfast by the time you get to the kitchen.

Forgot to check the door on your way out? No problem. You can lock the door with a mobile app and arm your security system from a few steps away, on the other side of the world, or even from an airplane.

On the way to your office, a custom smartphone app checks traffic and weather, shows you the fastest route, and directs you to a parking space. It provides your day's schedule and reserves a workstation for you based on your personal preferences for location and collaboration with colleagues. Morning coffee? The office espresso machine knows you prefer a double, and has it ready when you arrive.

Wherever you choose to work, the building adjusts the lighting and temperature just for you—and it can even play your favorite music. Time to collaborate? Reserve a conference room from your smartphone and wirelessly connect to a nearby whiteboard to share a presentation.

After work, you're off to buy a new shirt. Your smartphone shows that a nearby store carries your favorite brand. Once inside, your smartphone app points you to the right aisle, where a sales clerk greets you and already knows your size and style preferences. You pay with your smartphone on the spot.

The bottom line? Smart building technology is everywhere, seamlessly connecting you with your environment. It's no secret that technology improves the quality of your everyday experiences. ***But the question remains: are smart buildings smart for business?***



The connected future is already here – is your building plugged in?

It's no secret that the trend toward digitization is increasingly becoming ingrained in organizations worldwide - and it's disrupting the way business is done. According to a 2015 global study conducted by MIT Sloan Management Review and Deloitte, almost 90% of respondents anticipate their industries will be disrupted by digital trends to a great or moderate extent. What's troubling about this change is only 44% of global respondents think their organizations are adequately preparing for these digital disruptions.

In addition to changing how work gets done, digitization is also transforming the way we experience and interact with our surroundings - which has profound implications for the way leading organizations approach facilities management (FM), commercial real estate (CRE), and even strategy. Smart building technologies are one tool within the scope of digital CRE that can be leveraged to drive positive outcomes in this new age of digitization, automation and disruptive change. The benefits of adopting smart building solutions range from optimizing building operations to improving workplace strategy to improving the human experience by helping to meet (or surpass) the expectations of an increasingly tech-savvy workforce.

Forward-looking building owners, tenants and managers are already realizing the competitive advantages gained from smart building technologies. Soon, buildings that don't have smart, connected systems are going to feel the impact, whether it be in terms of asset classification, valuation, rental rates, or even brand perception (from both current and prospective employees – and even clients). Today's organizations are faced with a new reality: incorporate smart building technology into your business strategy—or risk potential obsolescence and forfeit your competitive advantage.

The friction-free economy transforms the real estate dynamic

The growth of the Internet and the proliferation of Internet-enabled “smart” devices have created ubiquitous connectivity to the Internet and expanding access to data. Originally observed by Bill Gates in his book *The Road Ahead*, the transformative power of “friction-free capitalism” continues to impact our world today.

While traditional economic models are rife with “friction” -- or barriers to commerce such as middlemen, convoluted processes or other constraints -- in a friction-free economy, these roadblocks are significantly reduced, or even eliminated. Instead, buyers and sellers, and producers and consumers, are able to conduct business directly with one another. With an open line between buyers and sellers, goods and services are more efficiently procured, customized, paid for, and delivered.

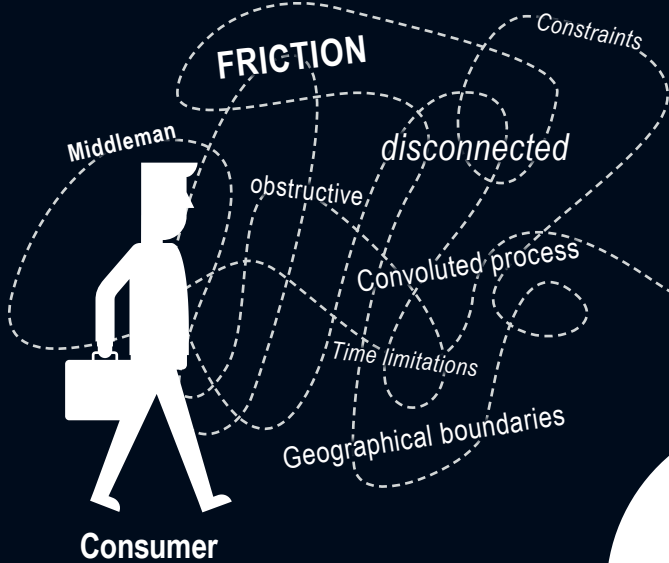
In response, entirely new business and operating models have emerged. Countless on-demand and shared are disrupting existing markets and providing easy access to transportation, virtual assistants, conference rooms for meetings, lodging in someone else's home, dog walkers, assistance with one-off tasks or errands, social meet-ups and more. Consequently, the widespread availability and accessibility of friction-free services are increasing consumers' expectations for fast delivery, streamlined purchasing, and customization of their purchases.

“Frictionless” expectations are growing across the board, and this paradigm shift includes facilities, too. In the built environment, a building's end-users—whether employees, clients, or visitors— increasingly expect an interactive and personalized experience, which is tailored to their preferences and responsive to real-time conditions and needs.



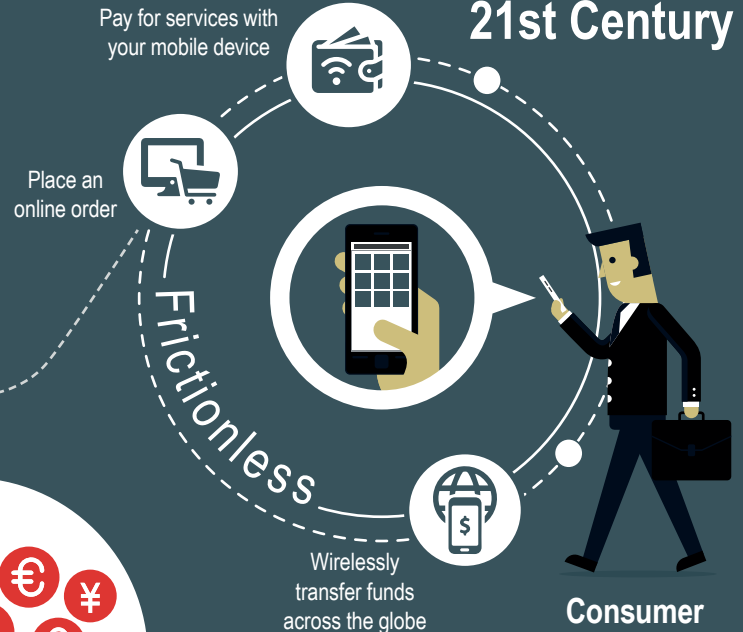
Friction-free economy

Traditional

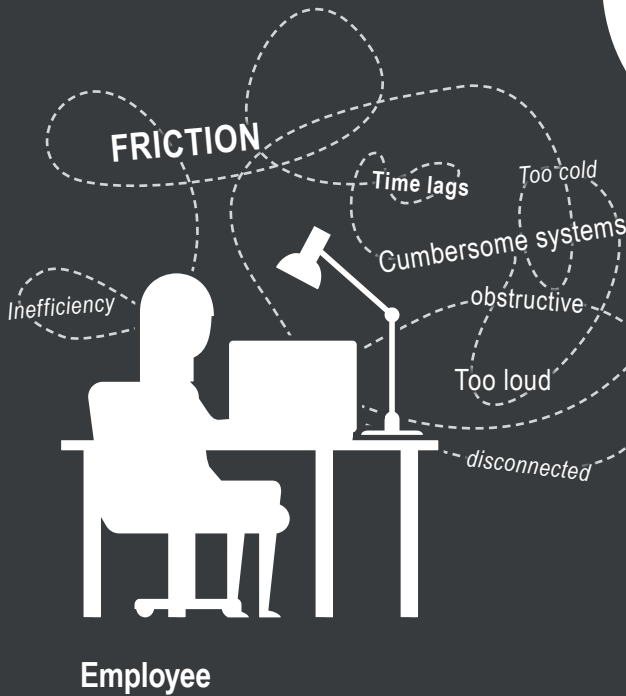


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FRUCTION



Business outcomes of friction-free economy



Cost savings



Data-driven insights



Competitive advantage



Increased productivity



Better human experience



Operational excellence

In the workplace, employees are becoming active consumers, rather than passive recipients, of flexible, adaptable workspaces that improve their comfort, engagement, and productivity. In a smart building, for instance, employees can use mobile applications on the fly to reserve their workspace or meeting room as quickly as their needs change—completely cutting out any “middleman” in the workplace equation (and contributing to a more efficient, productive and cost-effective use of space in the process).

Coupled with sophisticated data and analytics, advanced smart building technology solutions enable companies to anticipate and respond more readily to consumers’ needs.

Fortunately, today’s organizations are also better-equipped than ever before to meet the rising expectations of their building’s end-users. Coupled with sophisticated data and analytics, advanced smart building technology solutions enable companies to anticipate and respond more readily to consumers’ needs. Today’s smart systems connect building occupants directly with their environment, offering personalized controls and eliminating the “friction” with operating legacy building systems.

More importantly, smart systems equip building occupants with the tools necessary to eliminate common sources of workplace friction – such as office temperatures that are too cold or difficulty finding a parking spot - and improve workplace productivity in the process.

“As consumers become more comfortable using technology to customize aspects of their everyday lives, we’re seeing an increased demand for similar technology-enabled experiences in the workplace,” says Mike DeNamur, Director of Sales and Marketing for United Technologies’ Building Solutions Group. “For the first time, organizations are looking to the built environment to facilitate these tailored, high-quality experiences for their employees, clients, and visitors. By creating an interactive, dynamic environment that responds to occupants’ needs seamlessly and in real-time, smart building technology helps businesses to bridge that gap between the built environment and the occupant experience – doing so by better leveraging building technologies, and in many cases, without incremental cost.”

Companies are recognizing how smart building technologies elevate the experiences that employees, clients and visitors have in their facilities, increasing bottom- and top-line value. The friction-free economy is the new reality - and embracing and adopting the technologies, systems, and applications that go with it makes smart business sense.



Facilities management (FM) goes friction-free with smart technology

The friction-free economy isn't just changing the workplace dynamic – it's also revolutionizing the world of facilities management. With smart building technology, facility managers are able to monitor, manage and optimize building operations in real-time (and in many cases, remotely).

This is a fundamental shift away from the legacy building systems that operate at “widely acceptable” standards, with few opportunities to shed load or capacity (and even fewer opportunities to monetize that extra capacity through a demand response program). By contrast, smart building systems respond to real-time operating conditions - whether that means automatically turning off the lights when a conference room is empty, lowering the thermostat when the temperature outside rises, or even diagnosing a system malfunction and rectifying it immediately – enabling facilities to operate at peak efficiency.

Advanced technology solutions also provide FM teams with the tools they need to automate workflow and deliver services more efficiently than ever before. Embedding smart technology as part of the FM service delivery streamlines the work order process, allows for more flexible, on-demand staffing and dynamic deployment, reinforces and documents compliance, and supports a mobile or untethered FM workforce.

“It's clear that the FM profession has changed dramatically in the past five years, largely due to the convergence of technological, workplace and facilities trends,” says Maureen Ehrenberg, International Director for Integrated Facilities Management at JLL. “Business priorities are evolving at lightning speed, organizations seek partners that are dynamic and agile, and executives are increasingly prioritizing worker enablement and the employee experience. The result is that FM must become a digital business.”

For facility managers and CRE teams alike, the benefits of optimized workflow and building operations range far and wide. From facilitating more effective energy management to achieving operational cost savings, and from reducing environmental impact and extending asset lifecycles, it's clear that adopting digital processes – and supporting digital workspaces - is rapidly becoming a necessity for strategic FM.

The smart building business case for corporate occupiers

As consumers in today's friction-free economy expect more from their surroundings, corporate real estate owners and occupiers must consider the implications for the built environment and adjust their strategies accordingly. Forward-looking corporate real estate executives increasingly seek connected, efficient facilities that can support modern workplace technologies and a customized human experience.

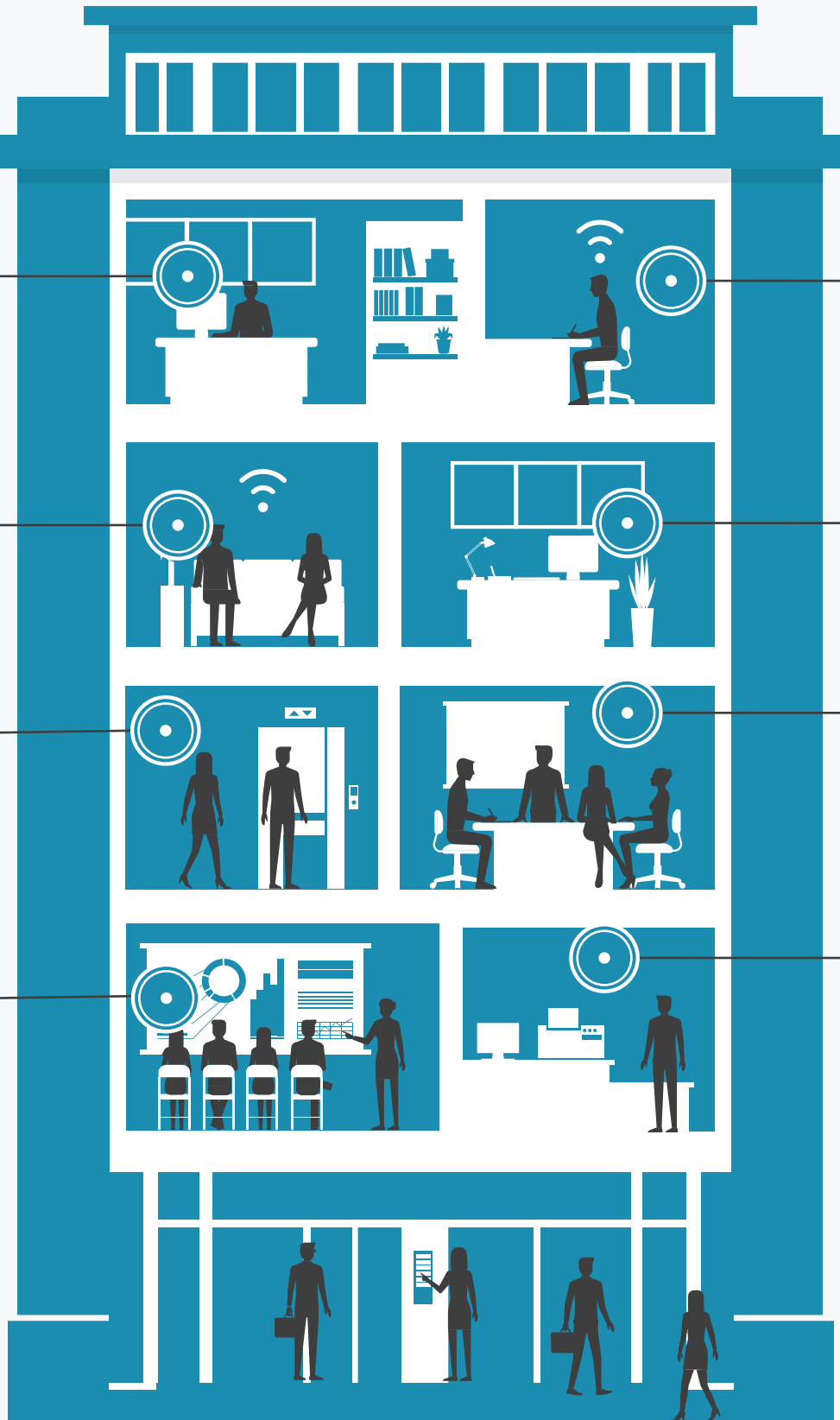
The focus on the individual and his or her needs is no coincidence. Many companies have begun to view their facilities with an eye on attracting employees and keeping them engaged and productive. The impact of digitization across an organization has a strong impact on talent. While not limited to the built environment, the global study conducted by MIT Sloan Management Review and Deloitte showed that “significant numbers of employees and executives are ready to leave companies that aren't keeping pace with digital change.” Thus, as the war for fresh, top talent intensifies, keeping workers connected, engaged and productive provides a strategic advantage. Optimizing the human experience with smart building technologies is quickly becoming a competitive imperative.

Smart buildings can help companies meet and exceed employee expectations with modern, technology-equipped workplaces. In fact, simply creating a comfortable and responsive environment can make a significant difference in employee satisfaction and productivity. Research from the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) shows that offering a building's occupants greater control over the temperature and lighting of their workspaces—via a customized mobile app, for example—can contribute to direct productivity gains of 0.5 to 5 percent.

“Smart building systems with interactive controls create a direct feedback loop between building occupants and the built environment, which is absent in legacy building systems,” says Dr. Panagiota Karava, Associate Professor of Civil Engineering at Purdue University and faculty at Purdue's Center for High Performance Buildings. “Offering employees the opportunity to leverage this feedback loop to optimize their comfort levels is an important step in creating a more productive workplace.”

Next-generation workplace technologies will further this personalization, providing advanced amenities and more robust support for all types of workplace design and use. For instance, some companies already provide mobile applications and smart technologies that allow employees to customize the temperature and lighting in their workspaces, in addition to requesting workplace services with their smartphones.

Smart building technology in action



Intelligent lighting systems

Detect when a workspace is vacant or occupied, adjust based on individual preferences, and respond according to the availability of natural light.

Mobile devices

Automatically connect to the wireless network, no matter where the employee is working.

Smart apps

Pull data from external sources, such as traffic, weather, and even train schedules, to support time management and productivity.

Occupancy sensors

Turn off designated electrical outlets and plug strips when a workspace is vacated.

Elevators

Proactively respond to occupancy levels and real-time conditions, such as a car pulling into the parking garage or a large meeting ending early.

Conference rooms

Quickly scheduled through mobile apps that know which rooms are available and when.

Digital signage and wayfinding

Direct occupants to conference rooms for meetings or to exit routes in an emergency.

Printers

Alert the user when ink is running low, and sensors in kitchens and bathrooms mean they never run out of supplies.

Real-time data for smarter strategy

Smart systems also generate terabytes of data that, when shared across systems and platforms via an integrated smart network, go beyond operational data sets to yield crucial strategic insights. Facility managers can analyze this data and use their findings to optimize facility, workplace, and business performance, creating a competitive advantage for the companies that own or use the facilities.

This proliferation of smart building data has important implications for energy management. As today's organizations are under mounting pressures to prove that their operations are energy efficient, smart building systems gather the granular operational data that businesses need to document and verify energy performance. When coupled with sophisticated analytics, reporting capabilities, and a robust energy management program, this data becomes even more powerful.

“There's no question that smart building systems – and the massive data sets that they generate in real-time – can play a pivotal role in an effective energy management program,” says Cindy Jacobs, Senior Advisor for the Commercial and Industrial Buildings Branch of the U.S. Environmental Protection Agency. “In many cases, smart building data and analytics offer the tools that facility and building managers need to communicate the value of their energy efficiency initiatives to their organization's stakeholders. Integrating this data with whole-building and portfolio-wide metrics from ENERGY STAR Portfolio Manager®

takes this data storytelling capability to the next level – delivering the high-level metrics that executives expect, alongside the granular detail that drives day-to-day energy management.”

Facility managers and workplace strategists can also use building data to answer key questions that drive smarter workplace strategy decisions. What space is being used at capacity—or underutilized? When is it used? And by whom? With smart building infrastructure, space utilization studies can now be based on real-time data, rather than one-time surveys or guesswork. Leveraging data analysis, an organization can quickly understand whether facilities and services are boosting workplace productivity—or are falling short.

A company may learn, for example, that certain meeting rooms are rarely used because employees prefer a smaller or larger room—or they prefer to meet informally in the cafeteria. Or, with an increasingly mobile workforce and the rise of hoteling, a company may find it can accommodate an influx of new employees without increasing its square footage—or possibly even shrink its footprint.

There's no question that smart building technology delivers real value to businesses – from optimizing building operations to driving a smart workplace strategy to elevating the everyday experiences that employees, clients and visitors have in a facility. As forward-looking organizations turn to smart building solutions, the greatest risk lies in ignoring these opportunities and being left behind in the process.



The smart building investor advantage

For commercial property investors, the “smart” factor is already gaining traction in the marketplace. In fact, the growing adoption of smart building technology is driving changes in the overall real estate market. Experts anticipate that building valuation models will soon evolve to incorporate the building’s “intelligence,” especially as smart building technology drives improvements in efficiency and utilization, and creates leverage for investors in new, unique ways.

As the frictionless economy drives changes in how businesses and individuals look at office space, it’s also disrupting traditional property leasing models. Today’s co-working firms, for example, rent spaces from landlords, create a communal co-working space, and then incrementally lease that space back to companies and individuals at a premium on a month-to-month basis. As building owners increasingly look to commoditize previously unused or underutilized areas and capitalize on this new approach to space occupancy, it’s also changing the rules of lease underwriting – forcing lenders to adjust their traditional practices.

While researchers work to quantify the total impact of smart building technologies on rents, shared economy space and property values, the benefits of energy efficiency are clear and well-documented. Smart buildings tend to have lower energy usage and operating costs than buildings with legacy systems, which translates into greater returns and increased market value. Recent research shows that buildings perceived as energy efficient sell at a 2 to 17 percent premium over less advanced properties, attract 8 to 35 percent higher rents, and achieve 9 to 18 percent higher occupancy rates. Clearly, tenants are increasingly willing to pay a premium for modern, efficient facilities.

Yet, until recently, many commercial property investors have hesitated to invest in smart building technologies. Many viewed the technology as costly, with an unpredictable payback period and return on investment.



Smart buildings, sustainable businesses

It’s no secret that sustainability is rising up on the corporate agenda – and with good reason. The business benefits of a well-designed sustainability strategy range far and wide, from unlocking cost savings to improving efficiency, and from boosting ROI to enhancing an organization’s brand image.

An organization’s commitment to sustainability and corporate social responsibility is also an important differentiator when it comes to attracting and retaining top talent, building long-term client relationships, and even raising capital.

Fortunately, smart building technology can be a powerful tool for organizations seeking to become more sustainable. For example, smart building systems have the ability to monitor, manage and optimize energy consumption – from automatically powering down electrical plugs that aren’t in active use to responding to cooler-than-usual outdoor temperatures by turning down the air conditioning. This ability to shed energy load and capacity in real-time – and even offer capacity back to the grid – is crucial to reducing greenhouse gas emissions and overall environmental footprint.

The data gathered from smart building systems can also provide proof of an organization’s commitment to sustainability, as well as enable more effective performance measurement, benchmarking, and reporting for sustainability initiatives. As stakeholders – including current and prospective employees, clients, and shareholders – increasingly seek evidence that a firm’s sustainability programs are effective and impactful, the data gleaned from smart building systems offer the verification and proof points that organizations need to affirm sustainability as a strategic business priority.

“The connection between smart buildings and sustainable businesses is clear,” says Christian Ulbrich, JLL’s CEO. “Smart building solutions create sustainable value for all of an organization’s stakeholders, including clients, employees, shareholders, and communities.”

Investors are learning that today's smart building technology is more available and affordable than ever before, and is driving shorter payback periods and improving return on investment. For example, the cost of wireless sensors has dropped below the \$10 per unit cost threshold, lowering the cost of smart building network infrastructure while increasing a property's appeal to forward-looking corporate tenants.

Today's investors must also look beyond the impact that smart technology can have in the building's common areas to consider how technology can improve the tenant experience. "There is an enormous opportunity for commercial real estate owners to leverage smart technology as part of their tenant engagement strategy," says John Chung, Vice President of Technology at Allied REIT. "Forward-looking property owners are already making investments in the intelligent infrastructure that new and existing buildings need in order to create the innovative workspaces that tenants crave – and those who don't embrace this shift risk being left behind. Just as today's facilities are universally expected to have running water and proper ventilation, we anticipate that, in the not-so-distant future, smart building technology will also top tenants' lists of must-have qualities."

The case for smart buildings is clear: organizations that embrace such technologies will be positioned to win—and those that don't will begin to be left behind

Lower operating costs also add bottom-line value for property investors. Research from New Horizons for Energy Efficiency found that using advanced control strategies reduces HVAC costs by 24 to 32 percent. Combining smart building technology with energy-efficient windows can drive down operational costs even more - by as much as an additional 20 percent. Clearly, buildings with connected, automated systems offer a long-term operating expense advantage over buildings with legacy systems.

"Whether a building is brand-new or decades old, we can demonstrate a strong business case for strategic investments in smart building systems and network infrastructure," says Darlene Pope, Senior Vice President of JLL's Energy and Sustainability Services business. "Intelligent lighting systems alone, for example, can shave 50 to 75 percent off a building's lighting costs -- and that is only one example of the smart technologies available today."

Smart building technology is quickly becoming a market differentiator for commercial properties. Companies committed to reducing their carbon footprint while also enhancing the workplace experience have begun to recognize that smart buildings are best equipped to meet their needs. For real estate investors, smart building technology - with cutting-edge solutions and the proven impact on the bottom-line – is a potent differentiator in the marketplace.

Buildings that evolve with business

For occupiers, owners, and investors alike, the case for smart buildings is clear: organizations that embrace such technologies will be positioned to win—and those that don't will begin to be left behind.

The benefits of smart buildings extend beyond energy and maintenance savings; creating engaging consumer and employee experiences that increase satisfaction and productivity boosts top-line value as well. Connected buildings also help companies pivot quickly in response to fast-paced business demands and workforce needs.

Are smart buildings smart for business? The marketplace is responding with a resounding "Yes." For both investors in and occupiers of commercial real estate, the question is no longer whether to invest in smart building systems and an interconnected and enabled workplace—but when.

Contacts

Maureen Ehrenberg

International Director and
Chair of the Global Board
Integrated Facilities Management
Maureen.Ehrenberg@am.jll.com

Yash Kapila

EMEA Integrated Facilities
Management Lead
Yash.Kapila@eu.jll.com

Susheel Koul

APAC Integrated Facilities
Management Lead
Susheel.Koul@ap.jll.com

