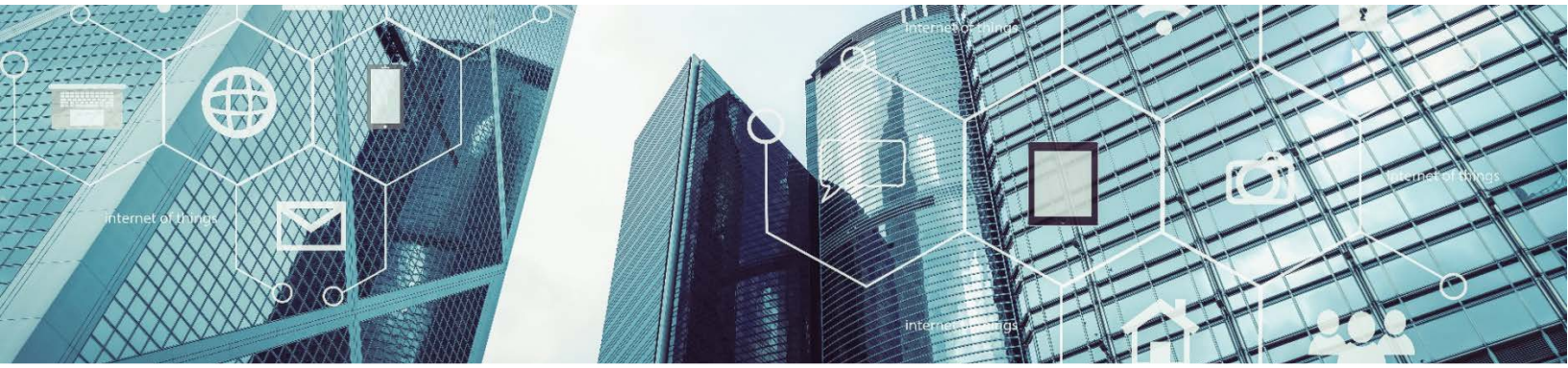
NAVIGANT
RESEARCH



WHITE PAPER

State of the Smart Buildings Market

Inaugural Landscape Report

Published 2Q 2019

Casey Talon
Research Director

Noah Goldstein
Director

SCOPE OF STUDY

In spring 2019, Navigant Research worked with Intelligent Buildings LLC, Anixter, and UL to launch the inaugural *State of the Smart Buildings Market Study*. The research included an online survey of 500 decision makers across North America which gathered demand side perspectives shaping the outlook for the evolving smart buildings market. Executives provided deep insight into the key challenges that have limited mainstream adoption of smart building strategies and the investment benefits that can accelerate market adoption. The survey respondents represented C-suite, vice president, and manager level influencers across the commercial office, higher education, government, healthcare, retail, and restaurant verticals. The sample also represented the market with a mix of 70% of respondents owning their buildings and 31% leasing. The research explored topics including smart building technology budgeting and investment, IT/OT convergence, emerging business models, prioritization of enabling technologies, and change management issues. The goal of the project was to establish a baseline of smart building technology market adoption to track the pace of innovation. This is an important first step that will support building owners and managers in defining and executing a long-term smart building strategy.

Research Sponsors:

STUDY CONTEXT

Introduction

The concept of the smart building has been refined since its inception over a decade ago. It has expanded from focused approaches to automating and monitoring specific building equipment, to comprehensive integration, and cohesive systems management. A multitude of technology developments are infiltrating the world of facilities management. Data communications enhancements such as wireless and 5G, best practices in network design, and advancements in analytics enabled by artificial intelligence (AI) including machine learning are making technologies more effective and economical. The result is an ecosystem of smart building solutions that marry these technology advancements with domain knowledge of electrical and mechanical building systems to maximize energy and operational efficiency, safety and security, space utilization, and increasingly influencing productivity.

Even with today's more prevalent use of enabling technologies and broader understanding of the concept and importance of integration, customers can be confused by the expansive menu of options and lack of standardization in the smart buildings market. Navigant Research partnered with Intelligent Buildings LLC, Anixter, and UL to better understand current customer perspectives on the opportunities, challenges, and technology roadmap today. This inaugural *State of the Smart Buildings Market Study* white paper highlights the key indicators of market readiness, best practices, and investment trends gathered in the research. The sections that follow also offer definitions, approaches, and considerations aimed at reducing the confusion for today's building owner and manager. As the market evolves, future studies will revisit how user needs, perspectives, and technologies evolve.

White Paper Goals

Building owners and executives are struggling to compete for new talent and to establish employee and customer loyalties as stakeholders' expectations grow for technology-enabled experience. The challenge is universal. Executives expect uninterrupted connectivity from their car to their desk, which should sit in a personalized climate-conditioned space. Students and teachers expect their schools to embody sustainability and healthy environments to promote effective learning. Shoppers demand digital tools for seamless retail experiences between apps and brick and mortar stores. While different use cases may resonate with different audiences, a common approach to technology selection, investment, and deployment will help building owners and managers address these shifting customer expectations. The research done for this study validates these assertions. It also validates that having a formalized smart building investment strategy and execution plan is a competitive differentiator for building owners and managers.

Readers should take away a better understanding of the challenges and opportunities associated with smart building investments, the business justification for budgeting, the best practices toward successful implementation, and the risk of inaction. Readers should also consider why the smart buildings market matters to their business.

Navigant Research offers four recommendations from analyzing the survey and interview results that define the current state of today's smart building market:

1. **Market Leaders' Smart Buildings Journeys Are Underway.** There is consensus that adopting a smart building strategy is a competitive differentiator and that smart building investments can bolster core business goals. Dedicating time and budget to assess facilities, define a smart building strategy, and budgeting investment in technology upgrades and replacements is necessary to keep up with the competition. Building owners and managers who harness the building as an asset will benefit from stronger loyalty and better brand perception and will win and retain the position as market leaders.

2. **Change Management Is Hard, but the Time and Resources Pay Off.** Smart building enabling technologies such as controls, sensors, and analytics continue to evolve, but the real digital transformation of the business of operating buildings requires changes in decision-making and roles and responsibilities. Smart building success rides on collaboration between previously siloed business units with IT and operations teams at the center, but a growing list of stakeholder representatives should be brought to the table including the C-suite, human resources, sustainability, and energy executives.

> *"We have learned that you can design and build smart buildings, but to really leverage those buildings as an intelligent business asset, you need to have an overall strategy so that everyone who has a stake in the assets is on the same page."*
>
> *- Jessica Rose, Associate Director, Facilities: Analytics and Communications, Georgia Tech*

3. **Creating a Common Network Is Future-Proofing Today's Commercial Buildings.** The seamless integration between IT and OT is the foundation of the technical requirements for smart building solutions. Creating this link enables the data creation, analytical insights, and automated system improvements to deliver the wide-reaching smart building benefits made possible by the advancements in connectivity, interoperability, big data, AI, and cybersecurity. The IT network piece of the equation drives the real change in the approach to facilities management because it sets the stage for using smart building tools that work together instead of in parallel or even opposition. The sponsors of this research have defined the common network concept as the Fourth Utility™ infrastructure. Supplying this common infrastructure becomes a contract obligation alongside the supply of electricity, gas, and water. New data flows will enable transformation in design, construction, and facilities management as a requirement for following corporate smart building strategies.

4. **Choosing the Right Partners Will Deliver ROI and Minimize Risk.** The functional skillset for managing a smart building unites the legacy tools of IT and OT staff and leadership. Today, many organizations remain challenged to bridge this technical and domain knowledge divide, and must choose between investing in existing human capital, acquiring external teams or businesses, or selecting a third-party partner to outsource aspects of their smart

building operations. Partnership can be a cost-effective and robust approach to executing the smart building strategy, particularly for specific functions such as managing cybersecurity.

Smart Buildings Market Evolution

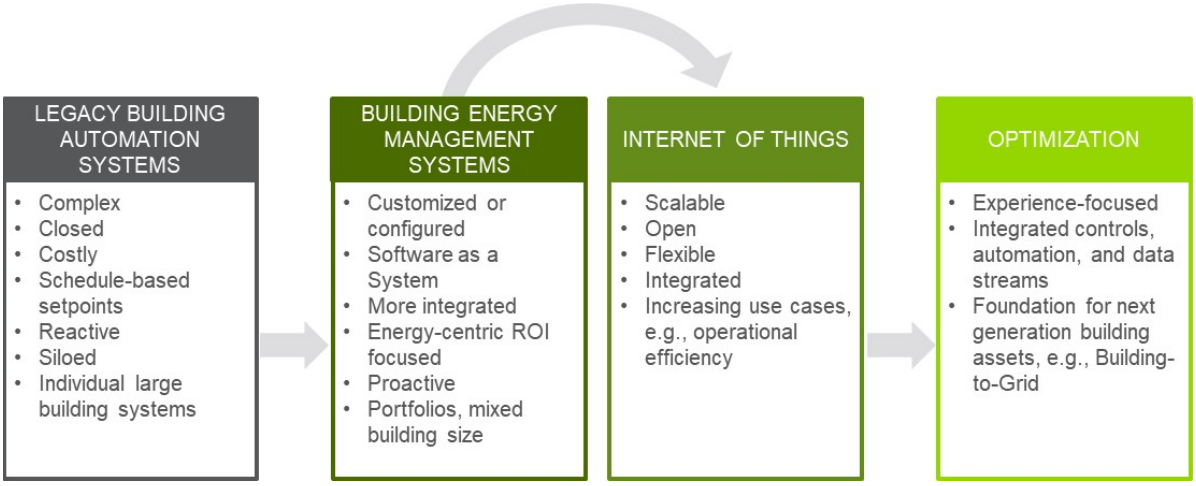
The following introduction to the smart building market offers readers the context within which the project sponsors operate and the trends that have led to the market confusion and stagnation that inspired this research effort.

Navigant Research has monitored the development of the smart buildings market and is maintaining a bullish outlook on technology adoption for the next decade. The market development of smart buildings reflects a trajectory from closed, siloed, and reactive product-based approaches to building system operations to an open, unified, and flexible model of building optimization. The following outlines the evolution illustrated in Figure 1.

- Since the 1980s, traditional building automation systems (BAS) were the state-of-the-art solution to managing schedules and monitoring equipment in the largest commercial buildings. While these systems explicitly focused on operational and facility management needs, they were also complex and costly. In many cases, the complexity and technical design limited operator interactions and led to underutilization.
- In the mid-2000s, building energy management systems (BEMS) were introduced as a software solution to overcome the challenges of working with BAS. An added benefit was that BAS' could offer easily accessible data into facility performance without existing automation and controls. The software applications showcased easy-to-use graphical user interfaces and delivered equipment performance indicators and opportunities for improvement framed through an energy efficiency lens. The focus on energy efficiency offered a straightforward measure of ROI as customers could easily act on the software-directed improvements. That ROI was in part due to reductions in monthly utility bills, and in part through improved equipment performance overall. BEMS garnered significant media attention and became an important channel for market education on the benefits of digital technologies for facilities management. Over the subsequent 2 decades, the BEMS market matured and then pivoted to harness the buzz of the Internet of Things (IoT) and capture executive mindshare with more strategic business use cases.
- IoT smart building solutions offer a supplement or alternative to traditional BAS and open the door to digitization of smaller buildings previously unserved by the BAS market. IoT is a more cost-effective, open, and flexible approach to the digital transformation of commercial facilities because these offerings use data streams from existing technologies and can be implemented with low cost wireless components. The software analytics of best-in-class IoT smart building solutions are the foundation of the value proposition for investment. These solutions use data from any existing building system and use supplemental devices to provide a cohesive and comprehensive view of performance—breaking down the siloes of individual system automation.

- The next stage is the focus on two core objectives: optimization of performance and the customer experience. New applications use the diverse building systems, occupancy, weather, energy and other data streams and translate actionable information on strategic business challenges. These include energy savings and other business metrics (e.g., customer flow in a store, occupancy rates for rented offices, time for locating shared assets in healthcare) that may be even higher priority. There is an increasing focus on aligning the system performance with occupant expectations for experience. Optimizing systems within the building to perform in coordination with other onsite resources such as solar, EV charging systems, or energy storage is the next frontier for the smart building. This next stage is positioned to shift the building from an energy end use to an energy asset, from a cost center to a low carbon profit generator.

Figure 1 Market Evolution: Products to Solutions and Broader Market Applicability



(Source: Navigant Research)

Technology developments including ubiquitous wireless technologies (e.g. ZigBee, Bluetooth, Wi-Fi, and Cellular) are enabling unprecedented connectivity, control, and efficiencies that transform buildings from cost centers to sophisticated and highly valuable resource assets. Digital technologies, new approaches to automation and control, and innovative business models will harness energy efficiency, electrification, and other distributed energy assets to accelerate decarbonization. Optimization will introduce opportunities for revenue growth across the sustainable energy landscape supporting the business of technology development, energy supply and management, and real estate.

How will the market and individual buildings get there? The transformation of commercial facilities into smart buildings, and ultimately optimization assets, is nascent. The transition from investing in smart technologies to establishing smart buildings has been stifled by inertia tied to the traditional business strategy and processes of facilities management. Success in deploying a smart building strategy and realizing the full potential of these data-driven solutions relies on a specific set of technical and business

process changes. The convergence of IT and OT is the crux of these processes and technical changes for developing smart buildings.

The exponential increase in connected devices generates the data that feeds the analytics and services for transforming facilities into smart buildings. However, the volume of data, requirements for connectivity, communications, and storage will strain existing infrastructure in new ways—this is the technical side of change management for smart buildings. On the process side, IT/OT convergence requires collaboration and coordination between leadership and staff from different departments and organizations within a building that have long worked in parallel or even isolation. Building owners will need to invest time and resources to achieve IT/OT convergence.

The Fourth Utility™ approach, as defined above, requires building owners and managers to supply infrastructure to support all traditional OT control systems and the advanced smart building technology stack. Approaching information as this new utility unlocks an organization's digital transformation potential by establishing the requirements for budget, time, and resources. This new commitment to convergence and the Fourth Utility™ infrastructure will help building owners achieve the smart buildings potential, whether that is attracting premium tenants, simplifying the management of multiple building systems, and enhancing collaboration and workforce productivity as well as enhanced cybersecurity for OT. This approach requires a base building network infrastructure that is designed and deployed to be both resilient and reliable enough to support data as a utility.

This inaugural *State of the Smart Buildings Market Study* was designed to explore the decision-making process in facilities operations that have slowed digital transformation and the development of smart buildings. The data presented in this report offers insight into current demand side perspectives on the barriers and opportunities of smart building development and lays the foundation for tracking how these perspectives change year-over-year.

SETTING THE STAGE FOR TRANSFORMATION

Understanding the Barriers

The variability of starting points and of building owner and facility operator goals complicates the definition of the smart building. To guide the survey, Navigant Research offered the following definition to respondents:

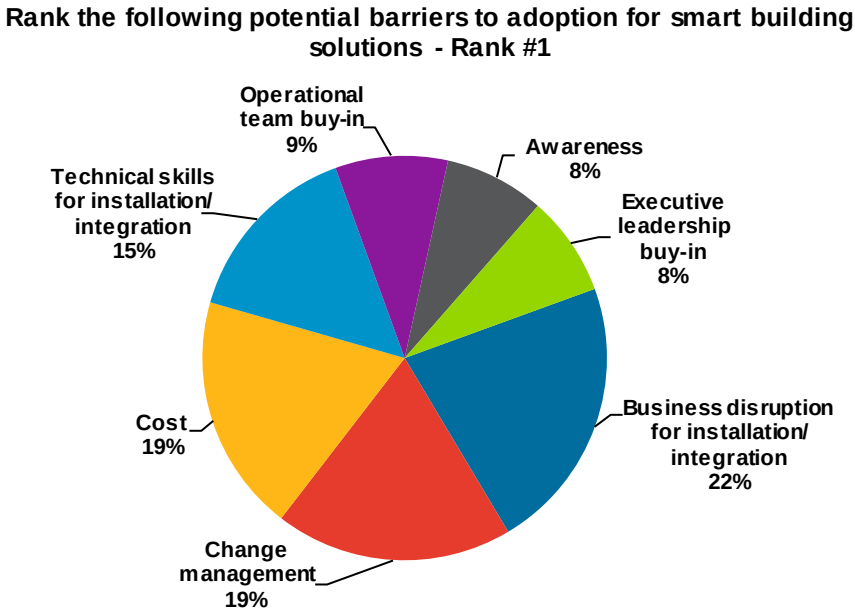
"A smart building is defined as a commercial or corporate facility that utilizes comprehensive data-driven solutions to enhance experience, increase productivity, lower costs, reduce risks, and improve the overall financial performance of the asset. These benefits are achieved through a sophisticated IT backbone for data creation, communication, aggregation, and storage and enables advanced analytics to optimize the automation of building systems including HVAC, access control, lighting, lifts, parking and fire, life and safety."

One of the goals of this first study was to evaluate the current state of market awareness and to define a baseline measurement of market maturity. The online survey and executive interviews provided the demand side data for defining the baseline market conditions. One of the first data points collected with the online survey focused on decision maker familiarity with the concept of the smart building. About 30% identified themselves as an "Expert" and just over 60% were "Somewhat Familiar" with smart buildings. This result suggests that 90% of the market is at least aware of the smart buildings market, but there is a long way to mainstream market expertise.

Establishing the baseline on customer readiness for smart building transformation is foundational for benchmarking progress overtime. The data gathered through the survey and interviews helped define the current state and provide the data against which each successful annual study will benchmark growing market maturity.

Understanding the perceived barriers to investment and implementation and defining solutions to help customers overcome them will lead to market transformation. Policymakers can define regulations to drive adoption of solutions that deliver energy efficiency, advocates can develop market education and outreach efforts around the climate impacts of smart building operations, and technology providers can market their solutions around use cases that align with customer priorities. Each of these efforts can help accelerate smart building solutions adoption, but will only be successful if there is a clear understanding of customer readiness.

Chart 1 Diverse Roadblocks to Adoption



(Source: Navigant Research)

The survey asked respondents to rank potential barriers to adoption for smart building solutions. There remains a wide range of perceived barriers, and not one single challenge that, if overcome, signals the pathway toward market acceleration.

- The smallest share of respondents ranked awareness, leadership, and operational team buy-in as their number one barrier. This result suggests the market has passed the earliest stages and key influencers understand the market opportunities at least at the most basic levels.
- There was a near-even split between perceived weight of the next four barriers. It will be worth tracking the relative impact of cost as a perceived barrier overtime, and it may remain a reality for decision makers weighing their investment options with strained budgets. Skillsets, disruption, and change management, on the other hand, are barriers that reflect deeper consideration for smart building investments. These barriers become clear to potential customers as they begin selecting specific smart building solutions and planning their investments and deployment. Disruption emerged as the number one barrier for the largest share of the sample (albeit less than 25% of the total), which reflects a pervasive challenge to solutions providers to educate potential customers on the reality of inconvenience and downtime and offer strategies to mitigate or at least minimize the burdens for owners and operators. Shortfalls in technical skills may reflect the changing workforce requirements for capabilities with information technologies necessary for digital transformation. Finally, change management is a longer-term strategic business challenge owners and operators must

tackle. At its core, a smart building represents a paradigm shift in facilities management—a new way of making decisions, budgeting investment, deploying staff, and valuing real estate assets.

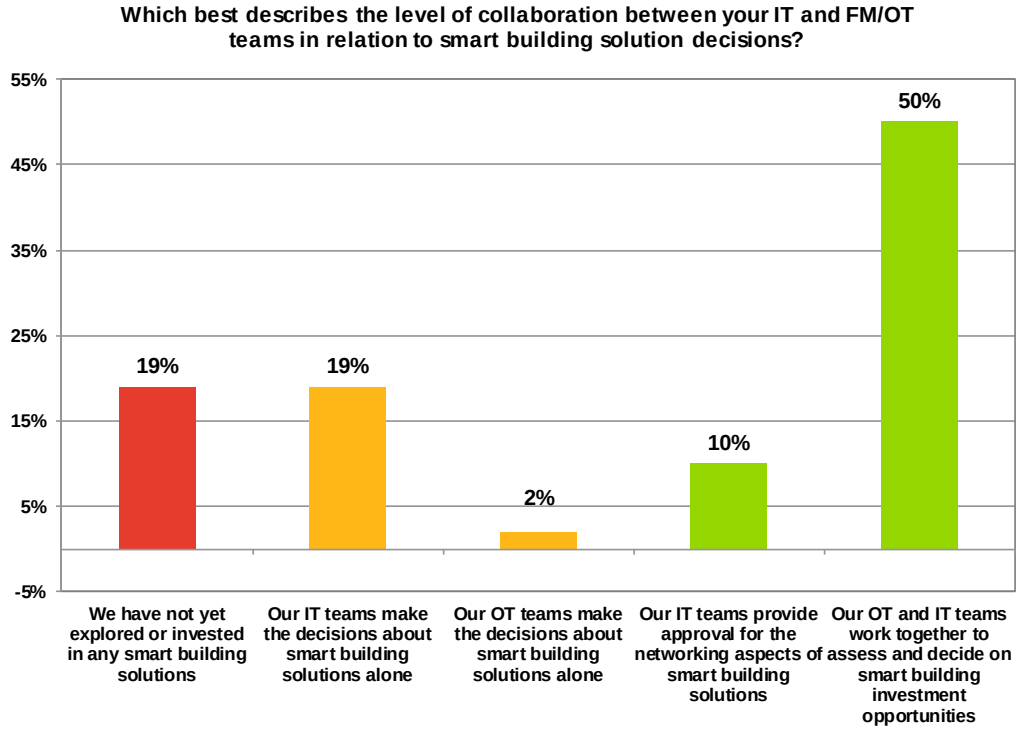
Achieving IT/OT Convergence

IT/OT convergence is the capstone for smart building success and one of the biggest goals for change management in this process of digital transformation. This convergence defines collaboration between leadership and operations teams that have long operated in isolation and development of seamless technical and domain knowledge across the technology stack from IT networking through building systems.

> *"What's key from our experience on IT/OT convergence is that the C-Suite is engaged and directing the change management process so that the entire team, from top to bottom, knows it is real and important."*
>
> *- John Gilbert, COO, Rudin Management*

The online survey respondents were asked to identify the current level of collaboration between these teams, and the options were designed to measure market maturity. As seen in Chart 2, 22% of respondents are making smart building solutions through the traditional functional siloes (marked as yellow), but 60% of those making smart building investments are doing so with influence or collaboration between IT and OT.

Chart 2 Change Management: Process Convergence



(Source: Navigant Research)

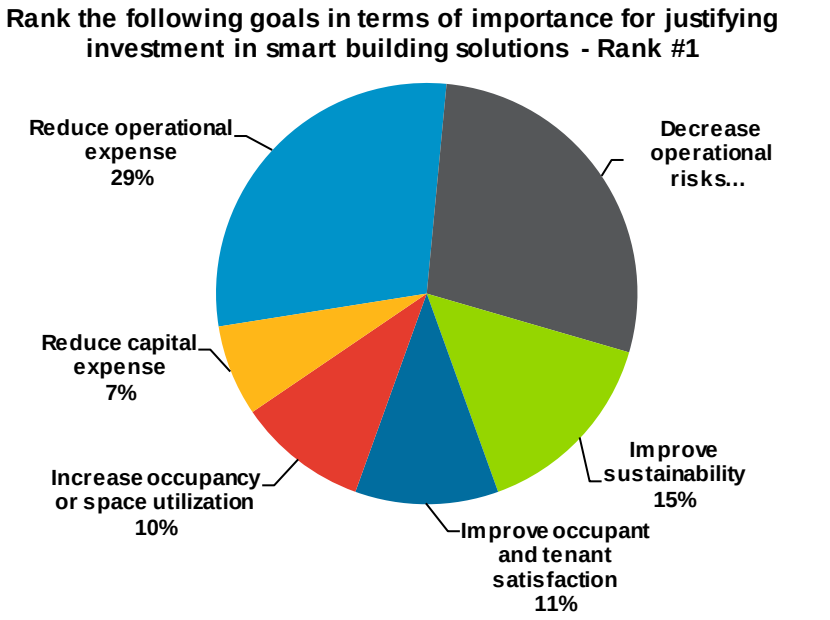
BUSINESS JUSTIFICATION

Moving from Awareness to Action

Since the mid-2000s smart building solutions providers have promoted their offerings with use cases to accelerate the investment process. Energy savings has long been the centerpiece of these conversations because of the ROI as measured by smaller monthly utility bills. The market has evolved, and energy savings alone will not justify investment and has failed to move the mass market as the only use case for smart building development. Today, energy savings remains just one part of the conversation; the business justification is more expansive to reflect broader strategic issues.

The online survey asked respondents to rank possible justifications for smart building investments and, as illustrated in Chart 3, the majority selected operational benefits as the biggest influencer which is the historic driver for smart buildings. However, there are two notable results from this question: 1) space utilization and satisfaction capture 10% or more of respondents' top priority, which aligns with the strong trends in linking smart buildings to the occupant experience in order to drive attraction, retention and productivity and 2) the very large percentage citing decrease in operational risks as a driver which underscores the emergence of OT cybersecurity.

Chart 3 Justifying Investment



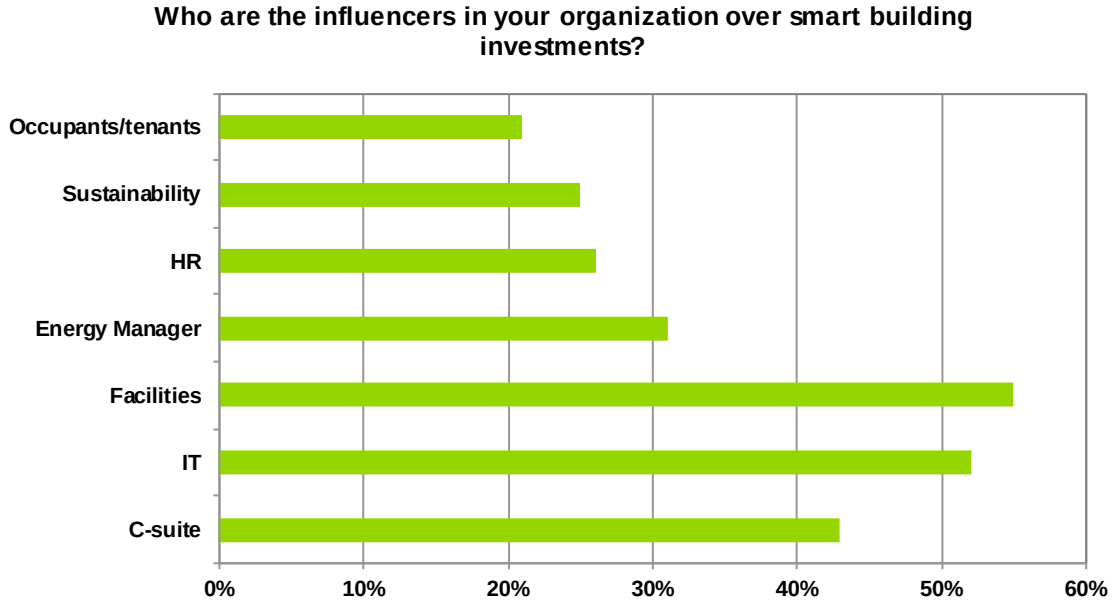
(Source: Navigant Research)

The diverse set of drivers for investment reflect an evolving and expanding set of stakeholders with influence on building management decision-making. Decisions that were historically compartmentalized into facility operations, IT, or finance, today have an impact on the ecosystem of leaders, operators, and occupants because of the digital infrastructure and technology impacts of smart buildings. This expanding sphere of influence was demonstrated by the results from the online survey, as illustrated in Chart 4. While facilities, IT, and the C-suite retain the highest influence, it is noteworthy that over 20% of respondents recognize occupants/tenants as influencers, closely following other functional business groups.

"When talking about the biggest advantages of smart building solutions, the whole conversation has pivoted from, we need 24-month return, to we need to know there is longer-term business value. We can make the investment if it can extend assets and make people more productive."

- Darrell Smith, Director of Real Estate and Workplace Services, Google

Chart 4 Defining the Sphere of Influence



(Source: Navigant Research)

DEFINING A ROADMAP FOR SMART BUILDINGS SUCCESS

Establishing Best Practices

Getting started on a smart buildings journey is a daunting task for many building owners and executives. For years, these decision makers have been bombarded by promotional material from technology providers but, until recently, the industry was missing the mark. As underscored by Bayron Lopez's insight to the right, technology for technology's sake is not the answer. Success comes from establishing an overarching smart building strategy, using existing technology and data, and selecting the right partners to deploy secure, effective solutions that will deliver ongoing benefits.

> *"One of the biggest challenges is that everyone is on the smart buildings trend—newest sensors, newest devices—but they forget how they are integrating. Many don't have the infrastructure and policy in place to be successful. Buildings are smart already, it's all dependent on how much technology to bring in and how to secure it."*
>
> *- Bayron Lopez, Operational Technology Manager, Kilroy Realty*

Identify Long-Term Goals

One-off investments in smart building technologies is an approach to test the viability of new digital technologies but without a long-term strategy there is a real risk of entering a potentially endless cycle of pilot projects. The consensus among the executives interviewed for this study was that success follows a process of conducting an internal review of core business challenges and mapping the functionality and benefits of smart building as solutions. This process will help executive and functional teams assess their priorities, sync budgets and ownership, and offer the path to define metrics for success.

Evaluate Current Network Infrastructure

The foundation of the smart building is a process of generating, communicating, and using data and analytics that then integrate with automation to offer a new digital approach to operating facilities. The building's network architecture should be the first phase in deploying a successful smart building strategy.

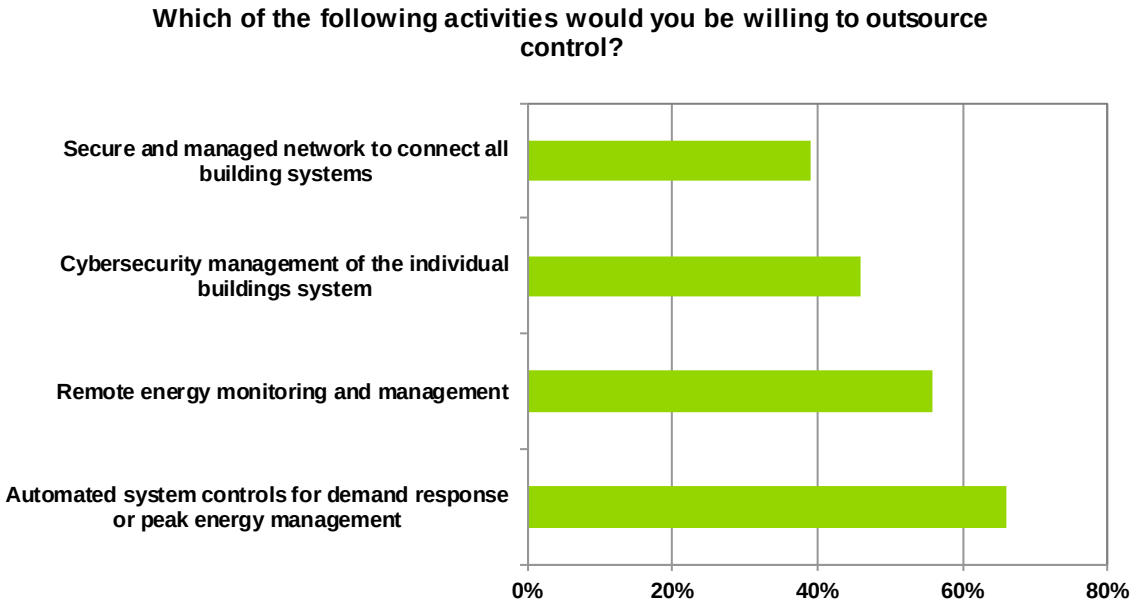
The exponential increase in connected devices in a building is facilitating the trend toward network convergence. The unprecedented volume, diversity, and speed of data being generated in a smart building environment puts new strain on existing IT infrastructure. A common building platform emerges as a cost-effective alternative that will support future applications moving through the smart buildings journey.

Building owners and managers have supplied electricity, gas, and water as non-negotiable resources, and today digital transformation introduces parallel expectations for telecommunications infrastructure that can support advanced technology. Approaching information as a new resource supply, the Fourth Utility™ is key to unlocking an organization's digital transformation potential. Investment in a common smart building network infrastructure helps future-proof buildings as the technology can support solutions that attract premium tenants, simplify the management of multiple building systems, or enhance collaboration and workforce productivity.

Select Partners

New partnership models are emerging as smart building strategies are executed. Companies may choose to outsource some of the new processes and approaches as an alternative to retaining existing human capital. According to the online survey results, 54% of respondents would allow a third-party partner to remotely control and manage their building to achieve operational and energy efficiency. The survey tackled the question further to understand what lies under this general measure of willingness to outsource. As illustrated in Chart 5, the numbers are higher or lower based on the specific task at hand. These results also mirror the development of market offerings—customers have been aware of and engaging with third parties for demand response and energy monitoring for years - the topics of cybersecurity and network management are emerging as the next frontier in smart building partnerships.

Chart 5 Outsourcing Smart Building Operations



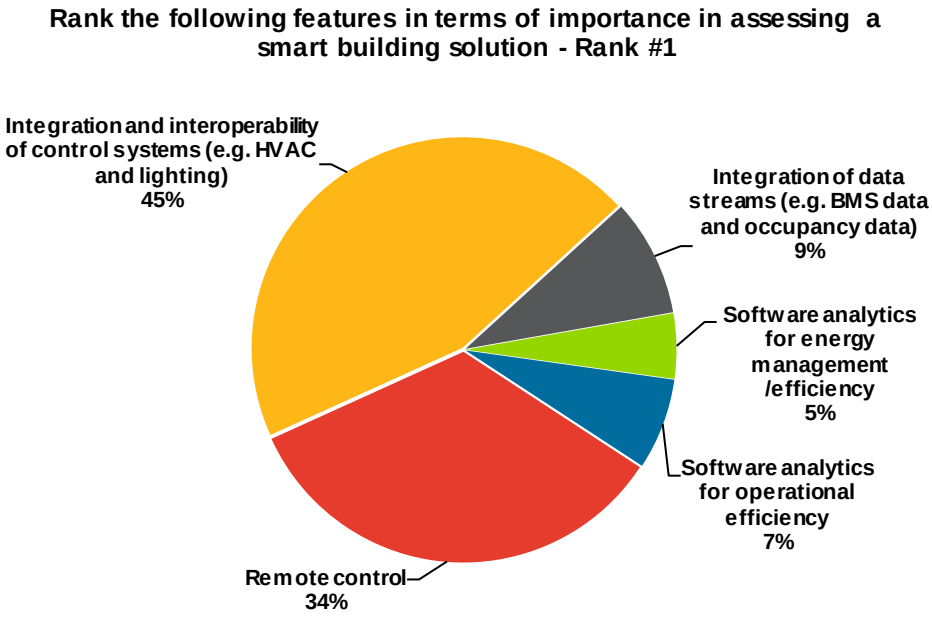
(Source: Navigant Research)

Customers can choose to build internal capabilities, acquire new staff with the expanded skillsets, or partner. Over time, the economics and ease of partnership may become the predominate model to ensure success in implementing corporate smart building strategies. The responses to two questions in the online survey underscore the opportunity for new kinds of smart building partnerships. When asked, “Does your facilities team have the capacity to utilize software-enabled smart building solutions?” 51% responded no; however, 55% reported that their organization is “using software to gather insights that will help optimize system performance, energy efficiency, operational efficiency or other aspects of building management.” These results illustrate that while there may be gaps in skillsets, the majority of decision makers are moving forward with digital transformation and increasing their reliance on data-driven solutions for operating their buildings.

Invest in Technology and Services

After establishing a strategy, identifying network requirements, and human capital needs, customers will need to invest in new technology to supplement or substitute for achieving their smart building goals. The online survey asked respondents to rank the importance of key smart building solutions. As illustrated in Chart 6, just under half selected integration and interoperability of control systems as the number one feature. Remote control was number two at 34%. The prioritization of these two features demonstrate building owner and operator understanding of the importance of cohesive control and remote accessibility. These features are key to ensuring the insights a new digital building deliver translate into action for energy and operational efficiency and other strategic business benefits.

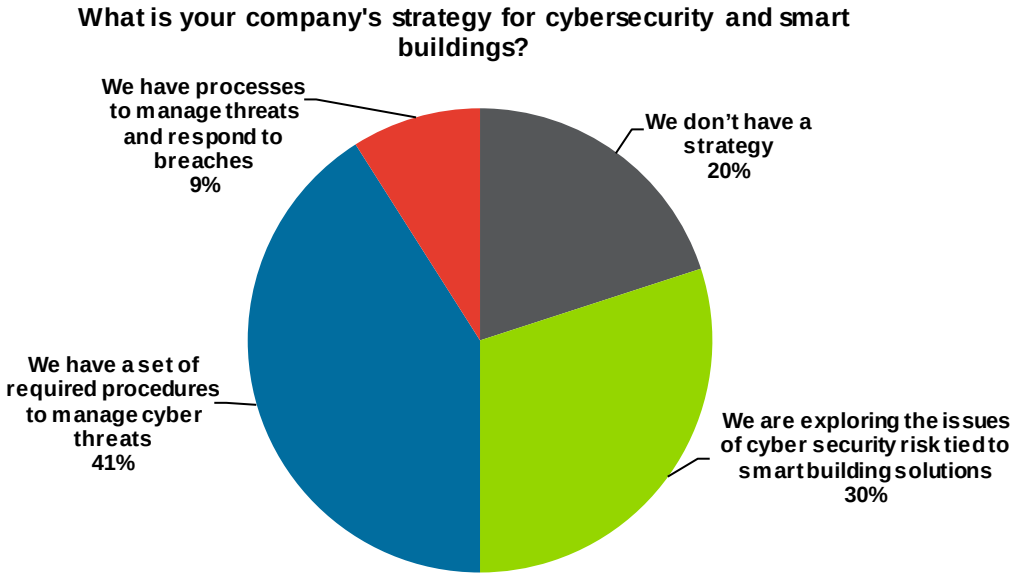
Chart 6 Prioritizing Smart Building Features



(Source: Navigant Research)

As illustrated in Chart 6, 46% of respondents are willing to outsource control of cybersecurity management of the intelligent building systems. The online survey explored the issue of cybersecurity resource requirements. The responses in Chart 7 track the progress on smart building cybersecurity across a spectrum of maturity from no strategy to fully implemented processes for managing threats and responding to breaches. The results illustrate that 70% of the market falls somewhere in the beginning to middle stages of the journey.

Chart 7 Defining Cybersecurity Strategy



(Source: Navigant Research)

We further explored the specific issue of cybersecurity with the question presented in Chart 7. Notably 50% of respondents do not have a strategy, or are just exploring the risk. While just over 40% have established procedures, and important step in defining an effective cybersecurity strategy, less than 10% have a full strategy and are prepared effectively. The issue of cybersecurity is consistently elevating as a priority concern for building owners and managers, but there remains a significant gap toward preparedness.

Choose the Financing Option

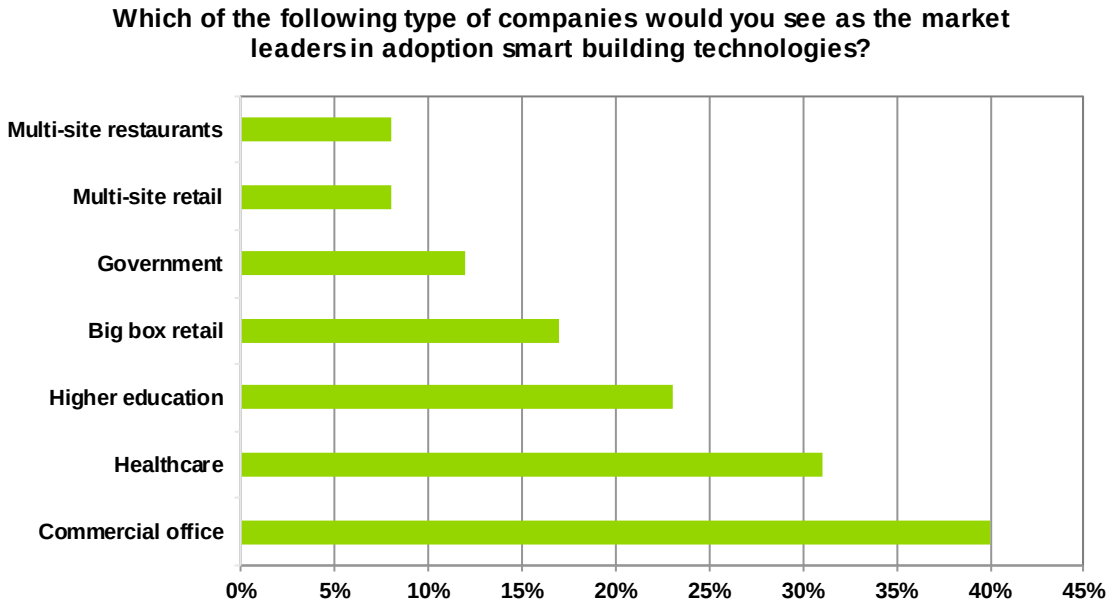
Financing smart building investments can be a significant hurdle for many customers interested in beginning their digital transformation journey. There are new options customers can explore to help manage the upfront costs, and explore new support services. Of the 26% of the online survey sample who made smart building investments in the last 12 months, 53% bought as a one-time capital purchase, 20% invested via as a service, 15% as a subscription, and 12% leased. These results illustrate that the traditional financing approach may dominate, but 35% of customers are exploring alternative subscription and as a service options. The as a service model has been gaining interest, if not significant traction. When asked, "What is your opinion about the "as a service" business models for smart building investments," 45% reported it is a viable option, 14% have used it, 32% did not have a strong opinion, and only 10% did not know what it means.

RISK OF INACTION

Competitive Momentum

What do these survey results and executive perspectives mean? The time is now to define a smart building strategy, choose partners, and begin the process of digital transformation. When asked, “Do you think adopting a smart building strategy is a competitive differentiator?” 63% responded Yes. Furthermore, there is still time to establish market leadership in any vertical, or even to showcase best practices for early adopters moving through the process. As illustrated in Chart 8, survey respondents recognized variation in smart buildings market transformation by vertical, with commercial office in the lead.

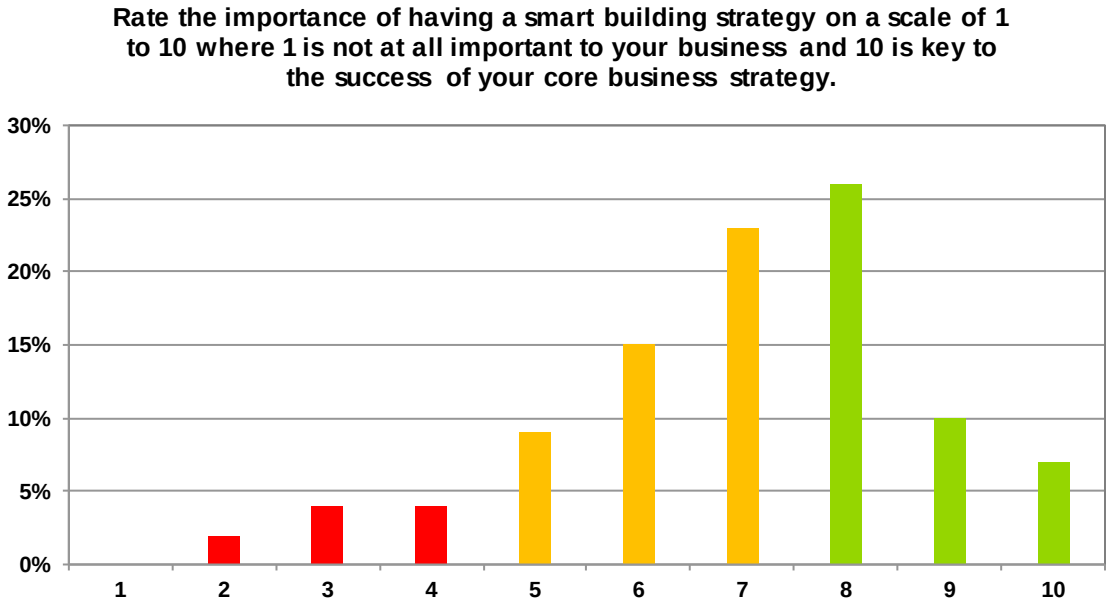
Chart 8 Perceived Market Leaders



(Source: Navigant Research)

Chart 9 shows that 43% of respondents align smart building strategy and core business strategy (as illustrated in green). This result demonstrates the level of customer awareness around the business impact of digital transformation in operating commercial buildings.

Chart 9 Aligning Smart Building Strategy and Business Performance



(Source: Navigant Research)

These data points illustrate that competitors are deploying smart building technologies today and realizing wide-reaching business benefits. These digital technologies can bolster the bottom line by optimizing space use, reducing energy costs, and even showcasing company commitments to sustainability and occupant experience. Finally, building owners and managers should recognize the importance of operational efficiency and decreased operational risk as driving investment in smart building solutions among industry peers, which underscores the rising importance of cybersecurity and user risk management.

CONCLUSIONS AND RECOMMENDATIONS

The *State of the Smart Buildings Market Study* offers building owners and managers important data to consider as they define their smart building strategy and investment goals.

For commercial real estate leaders looking to develop a smart building strategy, it is important to do the following:

1. Take stock of your buildings' performance, and current operational risks including cybersecurity
2. Understand if and how your tenants would benefit from smart building solutions
3. Assess how your teams are prepared for the introduction of new IoT-driven technology.

The following questions are also useful to ask as you evaluate the opportunities and challenges in investing in smart building solutions and look for partners to help you succeed throughout your journey.

First, while developing a smart building strategy, answer:

- Are you ahead, behind, or on par with your competition in defining a smart building strategy?
- Have you defined your smart building use cases, budgets, and outcomes?
- Where are you in the transformation journey? Do you know what steps to take next?
- Can your in-house resources support the increased demands on your building infrastructure?
- Have you developed policy requirements for your vendors to support your strategy?
- How will your fragmented building infrastructure evolve, supporting information with a Fourth Utility^{tm} infrastructure?
- Do you know what is a best-in-class smart building or smart building investment? What are the standards?

Next, create a specification for how your tenants can benefit from the optimized experience of your smart buildings, and answer:

- What are their technology needs?
- What are their expectations for engagement with smart building technologies?

Published 2Q 2019

1375 Walnut Street, Suite 100
Boulder, CO 80302 USA
Tel: +1.303.997.7609
http://www.navigantresearch.com