How to Maintain Constantly Evolving Smart Buildings

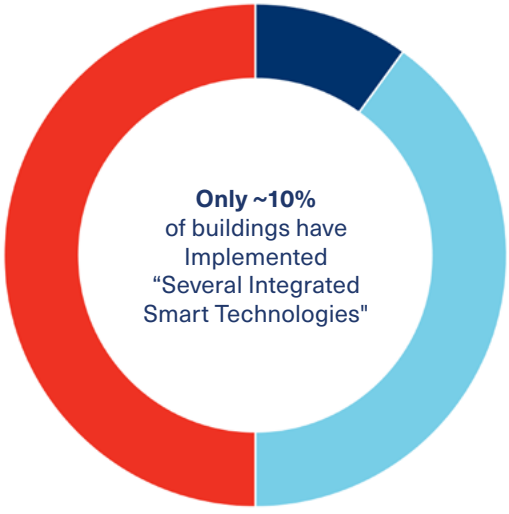
Modern building systems must support devices from yesterday, today, and tomorrow. Here are some best practices for how to make that all work.

The Future of Building Systems

When we look at the future of building systems, they are no longer static. Owners expect flexibility to meet their evolving needs and continually improve business outcomes. As a result, access to building data and smart technology that drives results is the new baseline as artificial intelligence (AI) begins to revolutionize buildings and challenge what's possible.

According to the Building Services and Research Information Association (BSRIA), "only 1-2% of commercial buildings currently deploy truly cutting-edge smart technologies with fully integrated products and services."[1] With global revenue attributed to building automation systems expected to increase a total of 4.5% compounded annually over the next 10 years, there is immense opportunity to deliver greater connectivity and intelligence to the existing built environment.[2]

Smart buildings are nothing new. Modern buildings are increasingly leveraging connected technologies and intelligence to continually improve performance. In addition, recent advancements in AI have had a significant role in the enabling of data analysis, predictive maintenance, and personalized occupant comfort. However, only about half of buildings in the United States are leveraging some degree of connectivity. This means there is immense potential available to help improve and streamline building operations.



10%
Several Integrated Smart Technologies

40%
Some Element of Smartness

50%
Unconnected, Older Building

1. BSRIA, The Latest Global Trends https://www.bsria.com/us/news/article/bsria_showcases_insight_into_the_latest_global_hvac_trends/
2. Guidehouse Insights Market Data on Building Automation and Controls.

The Cost of Doing Nothing

Although embracing change and new technology may have some initial challenges, there is a real cost to doing nothing.

1. **Missing out on future technology:** By refusing to adopt new technologies, engineers fail to position themselves for success and put buildings and systems at risk. According to PwC, more than 70% of companies have positioned themselves to adapt with AI technologies (PwC, 2024 Business Predictions). These companies are preparing for problems that may not be currently known.

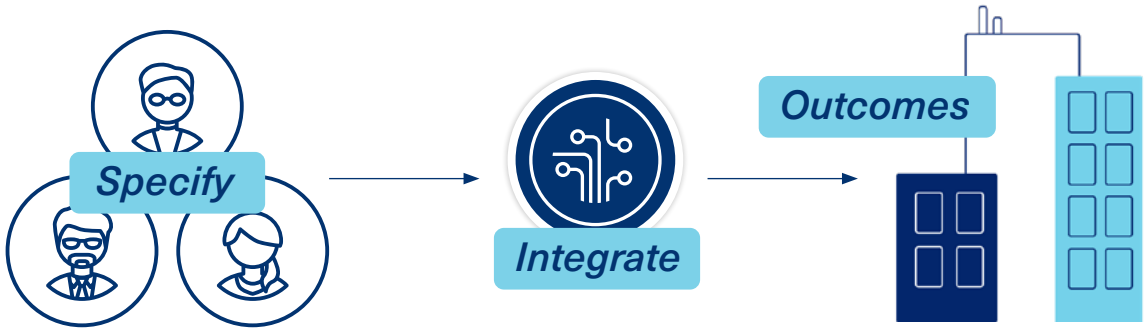
2. **Financial implications:** Local Law 97 is one of the first of many upcoming emission reduction laws that will be put into effect in the United States. This law requires buildings to meet new energy-efficiency and greenhouse gas limits by 2030, and the New York City government is projecting fines of over $900 million for not meeting the new requirements (Local Law 97).

3. **Protecting reputations:** As customers continue to become more environmentally conscious, companies must decide what they'd like their public image and reputation to be. In a Harvard Business Review survey, they found that 65% of people are more likely to support sustainable companies, and that social influence can have a staggering domino effect on related consumer habits (HBR, The Elusive Green Customer).

Where to Start

Engineers are relied upon as strategic collaborators, guiding decision-making through the design and implementation of a smart building solution. But with every building at a different point in its lifecycle and owners having a variety of goals, knowing where to start can be challenging.

In addition to understanding the owner's strategic needs and business goals, the engineer can best support the evolution of a smart building by using a tailored approach to keep the budget, timeline, and current environment at the forefront of a proposed solution.



1 Specify

There are many enemies of high-performing building systems, including lack of data availability, lack of data integrity, and challenges with communication and implementation. Through specifying open standard communications, you can help ensure that the building and equipment data will be properly communicated and easily accessible.

Focus on connectivity, even more specifically, connected systems that grant access to data, and the capabilities of remote access will allow you the flexibility to future-proof your system by enabling intelligent analytics and AI. Flexible communication support that utilizes industry standard protocols is key for the integration of devices, regardless of their age. And these connected services provide owners with a significant opportunity to help improve building optimization.

2 Integrate

Whether specifying connected systems for new buildings or seeking to modernize existing infrastructure, integration flexibility – or interoperability – is a key component to success.

In today's buildings, it is common to have controls and equipment from different vintages and to utilize a variety of building communication protocols. Integration flexibility accommodates the use of existing technologies and helps to pave the way for smart building growth in the future. It enables data-driven decision making and serviceability.

Designing a system with robust, open, standard protocol communications like BACnet Secure Connect can help lay the groundwork for future technology growth and support the process by following IT best practices. Additionally, leveraging both wired and wireless technologies can help simplify implementation and connect to existing infrastructure--without pulling new wires.

Together, these help create an infrastructure that is reliable, cost efficient, and easy to upgrade, while also allowing for secure deployment of IoT devices and cloud connectivity without IT security dependence. Engaging IT organizations early in project design, layout, and installation processes can help to mitigate any obstacles or challenges, eliminating potential implementation pitfalls. Most facilities need to meet codes, standards, guidelines, energy-efficiency goals, and local legislation. As a result, automation is required to coordinate the mechanical HVAC systems and complementary systems. Taking a phased approach with a proper system design will help support automation and optimization, without requiring everything in the building to be replaced. Working with a dependable contractor to help balance these inputs and deliver consistency is key.

3 *Outcomes*

The world of smart buildings and AI-delivered solutions is fast moving, and change accelerated by technology will never be slower than it is today. Keeping a pulse on smart building trends and advances will help you deliver the best outcomes on projects and provide the best results for your customers. There is a need for robust and reliable equipment data, and setting up a modern and connected infrastructure, providing access to data, ensuring that specifications can support a building's protocols, and designing a system that can hold and help maintain these needs are all at the center of guaranteeing future sustainability, and unlocking the potential of AI in buildings.

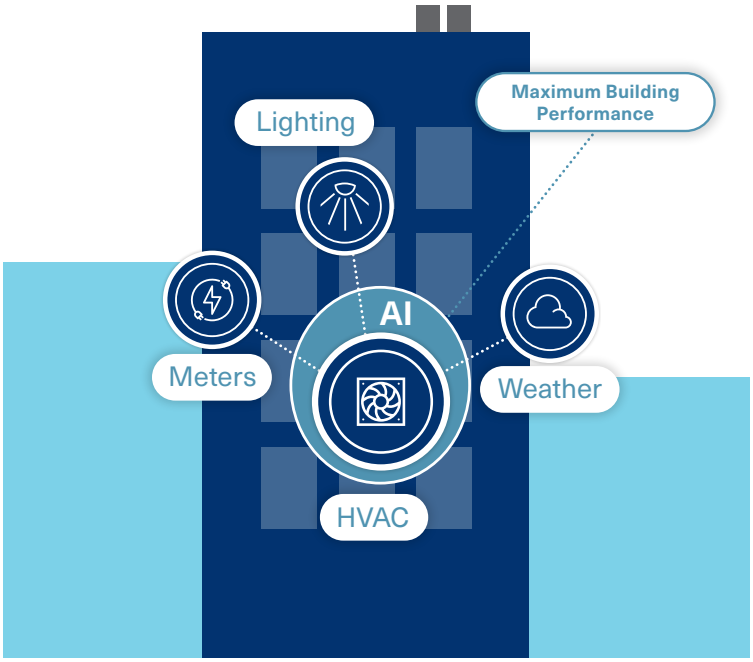
System maintenance is the last piece to the puzzle for maintaining a continuously evolving smart building. Complex systems need ongoing hardware and software updates by trained technicians to benefit from evolving technology. Informing owners about the expectations and best practices for responsibly managing their assets will set them up for long-term success and build a trusting relationship. A reliable maintenance plan with a trusted service collaborator will help keep the system that you designed in operation for years to come.

While an engineer can design the most optimal system, it must be handed off to the operator for daily use. Operators must understand the system and its complexities. Comprehensive help, training, documentation, and system safeguards can improve daily operations and minimize inefficiencies.

Achieving the Modern Building Success

Modernizing buildings requires a comprehensive approach. Many factors influence building system decisions, from market trends ranging from energy efficiency and decarbonization, to technology trends like cloud services and cybersecurity. Everyday demands such as productivity, lack of skilled labor, and meeting financial and ESG goals are impacting building decisions as well and must be considered. However, the key to success can be found simply by incorporating connected systems into building infrastructure. Pursue a trusted collaborator that guarantees the use of tested, secure products and is built on industry standards and best practices. This will help to set you up for seamless project execution—from design, to implementation, to ongoing maintenance. It is time to stop talking only about the opportunities within a smart building and start talking about the outcomes the smart building will achieve.

Trane understand's an engineer's goal is to design a system that supports devices from yesterday, today, and tomorrow.



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