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IoT impact on building design

When architects design a building, it is about more than just style or aesthetics. It is how those elements add to the user experience—how they are able to move about, function and even enjoy a building. And now, architects have another tool in their arsenal that is allowing them to take the building experience to a whole new level: Internet of Things (IoT).

Imagine a building where employees scan a badge or present a smartphone-based credential to gain access. When access is granted, the building's other systems are triggered to turn on the lights, adjust the temperature and alert security that someone has accessed the building. During the day the network monitors water use, sending an alert to facilities if a restroom faucet is left running or if a normally locked door is left ajar.

At the end of the day, the access credential is used to exit the building, triggering the reverse actions of the morning—lights are dimmed, temperatures are lowered and doors are locked. Welcome to a building automated by the Internet of Things, or IoT.

While access control may be the "trigger" for all of these functions, the entire system is based on a sophisticated automation system that allows every aspect of a building's operation to be networked, from lighting to intercoms, access control, video, fire safety and climate controls. In most cases, all of these functions have some shared equipment, even if they don't always have a shared "customer." You can conquer this potential divide by offering diverse services that add up to significant cost savings for the end user, as well as enhanced security.

In every building that has an integrated security and access control system, an opportunity waits to also integrate the building's energy use, water use, ventilation and more. Understanding these technologies and their design implications will be imperative as the demand for smart technologies continues to grow and be incorporated into building design and operations.

Internet of Things becomes key influencer

Of all the current technology trends, perhaps the most revolutionary in terms of its ability to completely transform the way we live is IoT. Using cloud computing and networks of data-gathering sensors, IoT enables machine-to-machine communication and creates a mobile, instantaneous link to this interconnected system. It's projected that by the year 2020 there will be as many as 200 billion connected devices across the globe. That translates to roughly 26 smart objects per person. IoT will ultimately enable anything with an on and off switch to be connected to the Internet.

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"Until very recently, the Internet has been almost completely dependent on people and their inputs for its supply of information," says Rob Martens, futurist and director of connectivity platforms, Allegion Security Products. "However, as tools and products evolve, these new smart devices are able to input data into the Internet themselves. When groupings of these smart devices work in unison, they can reveal previously unseen patterns and opportunities. These results generate huge opportunities."

In an automated environment, access control systems can be tied into a myriad other building systems to optimize lighting controls, reduce energy waste, increase worker productivity and more. And in a commercial facility, the result is a building that can not only respond to, but also actually anticipate its occupants' needs and activities. And the more subsystems tied together and automated, the more intelligent and efficient that building becomes.

"IoT is the launching point for so many of the future design and functionality elements architects will want to incorporate into their buildings," Martens says. "Even more, it will allow architects to create highly personalized designs—designs that contribute to an individual's experience when entering a building."

Building ROI for end users

As an architect, you want to design a building that gives your client the best return on investment in the long-term. Incorporating technology-driven efficiencies into design is an effective way to do that. Examples of those efficiencies include:

- Standalone intelligent controllers can reduce lighting expenses by as much as 40%, according to Energy Star.
- Buildings with strong southern light exposure can adjust HVAC and lighting based on actual conditions, rather than a fixed schedule, taking advantage of natural heat and light to reduce energy use.
- Buildings with door and window sensors can detect when doors and windows are open, signaling the system to automatically turn off the HVAC while also alerting security personnel to a possible unauthorized entry.

These examples of ROI are significant whether your customers occupy large commercial office buildings, healthcare clinics, restaurants, hotels or even manufacturing facilities. There are many areas to cover beyond security, so be prepared to discuss how other technology is intertwined to help produce greater ROI.

It is important to understand that the IoT is not represented just by connected devices. Think of it as a symphony that many devices can contribute to and just like any symphony, an experienced conductor becomes a critical element. — Rob Martens, Allegion

Your clients need to begin by conducting a thorough cost analysis. When surveying, you should look at everything from air handlers and chillers, to irrigation and what types of lighting are currently in place. Be sure to also include details like switching to LED lighting, and updating compressors and chillers, and show the total potential cost savings.

The ROI on building automation can sometimes free up money for other projects, while enhancing technology, comfort and security. This can be a game-changer for architects in the budget-conscious education, healthcare and government markets.

"When incorporated into building design, IoT allows facility managers to remotely monitor and manage devices," says Martens. "These 'no tour' capabilities of devices can save valuable time and money, in addition to providing proactive real-time monitoring of critical building systems."

Impact already felt in security sector

So when will this new technology impact the security industry? The simple answer is that it already has.

"We are already seeing a significant number of industrial grade IoT-enabled devices being embedded in commercial, multifamily and residential buildings," says Martens. "The IoT has already attracted new entrants to our markets, and a blurring of traditional industry boundaries is making it more difficult to identify knowledgeable industry experts from opportunists in what many of us believe to be a mission-critical space."

"It is important to understand that the IoT is not represented just by connected devices," says Martens. "It is the collective experience delivered to an individual or group by combining a shared ecosystem of Internet-enabled smart devices. Think of it as a symphony that many devices can contribute to and just like any symphony, an experienced conductor becomes a critical element."

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Creating a connected system that allows every part of the building to share information results in maximum efficiency and, ultimately, real cost savings for the customer. And it's a design element that is certain to change buildings of the future.

To effectively incorporate IoT, Martens says it must begin during the traditional planning process. Like access control, you have to plan early for other IoT functional elements—temperature, sound, lighting, etc .

"The design and aesthetics of a building are closely tied to user experience. In the next 5-10 years, IoT will become a leading enabler of the overall building experience," says Martens. "With all that it can make possible, IoT has the potential to become as important as the physical space itself."

Contact an Allegion spec writer (or call 877-929-4350) today for assistance on your building projects.

About Allegion

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