

We create buildings and environments that help people achieve.  
Because when buildings work better...people work better.  
We call that **BUILDING EFFICIENCY**.

CONNECTED SERVICES

## BUILDING EFFICIENCY ADVANCEMENTS CREATE A FOUNDATION FOR SMART CONNECTED SERVICES

Securely connected equipment and buildings offer building owners and facility managers more information and options than ever before, enabling them to take actions to make predictive and proactive improvements on the way they approach service.

As building equipment and systems become increasingly integrated and intelligent, they offer building owners and facility managers new and more effective tools to reduce repair costs, minimize downtime and keep their buildings operating at peak performance. The new generation of smart connected buildings links equipment, systems and data sources inside and outside the building with powerful control systems and sophisticated software applications, creating a network with the service technician and facility team at its center.

These connected technologies are redefining the way equipment and buildings are being serviced today. Smart connected services monitor systems continuously in real-time to diagnose symptoms and address them before a problem or breakdown occurs. This means facility managers, don't have to spend their time responding to alarms and maintenance crises reactively after they happen.

Technologies shaping connected buildings and services include:

- A new generation of building automation systems (BAS) delivers greater knowledge and control
- Smart equipment brings intelligence to building devices, boosting building performance
- Cloud-based technologies and solutions enhance management of buildings and portfolios
- Mobility tools help service technicians and facility managers stay connected



These technologies provide unprecedented levels of historical and predictive data that make smart connected services possible.

### **New Generation of BAS Delivers Knowledge and Control**

Today, building owners and facility managers are using the BAS in ways that could only be dreamed of in the past. It's not surprising that the BAS has become an essential tool for many facility managers. An advanced BAS serves as the command and control center for the facility. Information pours in from all parts of the building – settings, current readings, and alarms from occupied spaces and from inside complex equipment. An open BAS not only controls HVAC equipment from a variety of manufacturers, but also connects to the lighting, security, fire, and other systems, putting even more power at the fingertips of building managers.

### Smart Equipment Brings Intelligence to Building Devices, Boosting Building Performance

The movement toward connected buildings is getting an important boost from the introduction of “smart equipment.” Smart equipment essentially brings intelligence to individual devices in the field, says Jim Sinopoli, managing principal with Smart Buildings, LLC. An example is a connected chiller can report its performance, including any problems or malfunctions, on a regular basis to the service technician or facility manager. This occurs via an interface on the equipment or a software program the service technician accesses on a computer or mobile device.

The ability of the equipment itself to report on its performance – and on potential problems – is a crucial benefit for building owners and facility managers. Because facility staff no longer has to visually inspect each piece of equipment to detect operating issues, they can more quickly determine where to focus their efforts. While other technologies, including BAS and cloud-based solutions, can deliver some of this information, the implementation of smart equipment promises to increase the ease and cost-effectiveness of taking corrective action before a potential problem affects a building’s performance.

### Cloud-based Technologies and Solutions Enhance Management of Buildings and Portfolios

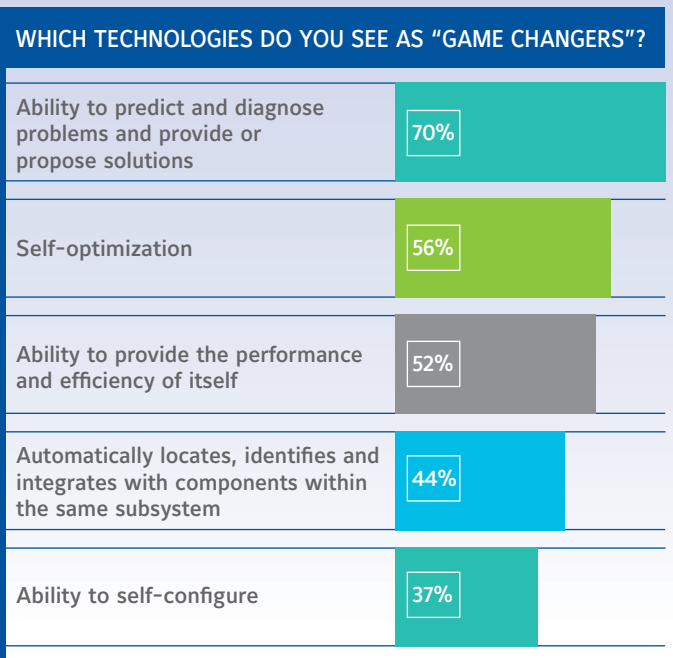
With the advent of cloud computing and custom applications, tech users have come to expect solutions with deep analytics that are not only scalable, but tailor-made for their needs. Cloud-based technologies bring that solution to the connected building, assembling data from one or multiple buildings and presenting normalized, unified information that’s been customized to user needs. Data from BAS sensors, smart equipment, and meters can be aggregated and analyzed alongside historical trend data from the same equipment. This data can be used to proactively assess service needs along with equipment and building performance. This rich cache of data offers users a bigger picture of their building operations and efficiency.

For instance, an application might offer fault detection and diagnostics (FDD) on the equipment level, proactively alerting the facility manager to the problems underlying that inefficiency, and in many cases catching abnormalities before equipment or BAS alarms are generated. When performance and trend information is aggregated and presented through one interface, accessible anywhere, users have the tools they need to make intelligent decisions quickly and address service needs before a costly or catastrophic breakdown occurs.

#### Where Can Smart Technologies Reduce Headaches?

It’s the prospect of smart equipment preventing problems and addressing chronic issues that plague building operators that has caught the attention of building owners and facility managers. In a survey of the Building Efficiency Panel – “Where Can Smart Equipment Technology Reduce the Headaches?” – 70 percent of respondents rated the ability to predict and diagnose problems and provide or propose solutions as a “game changer.”

“Many building owners and facility managers are looking for features and functions in equipment that can be predictive and say, ‘I’m not running the way I should,’” says Richard Hein, director, global marketing strategy with Johnson Controls. By incorporating smart equipment that offers this functionality as one component within a connected building, facility owners and managers can more efficiently ensure that their facility is performing at its peak.



Source: Johnson Controls

### Mobility Tools Help Service Technicians and Facility Managers Stay Connected

Given the wider range of building management tools and the increasing amounts of information available from smart equipment and buildings available today, it only makes sense that the service technician and facility manager are able to access this data even when away from their desks or the facility. "The power of mobility is that it puts information in the hands of people who can take action and enables them to provide a proactive, targeted response," says Juliet Pagliaro Herman, director of North American service marketing and product management.

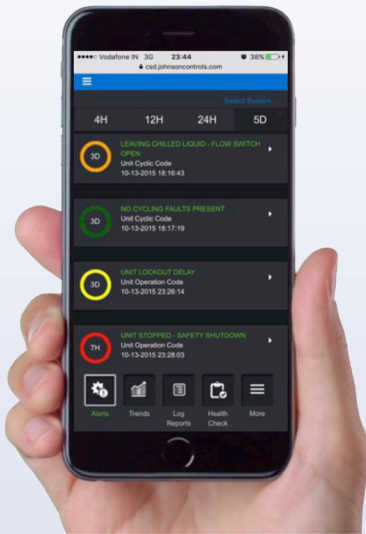
Indeed, 43 percent of respondents to the Building Efficiency Panel IT Mobility Survey said their operations currently use mobile tools with their BAS or BMS. Another one-third said such systems would be very important in the future.

Many facilities are still run through manual equipment checks and note taking, with operators forced to return to a central desk location to access building systems and data. But the mobile revolution is changing building management and transforming how service technicians and facility teams operate.

"More and more, mobile is becoming a bigger deal," says Craig Cherry, deputy administrator for facilities with the state of Oklahoma division of capital asset management. "If a technician can carry around a tablet and pull up and investigate problems, it's so much easier."

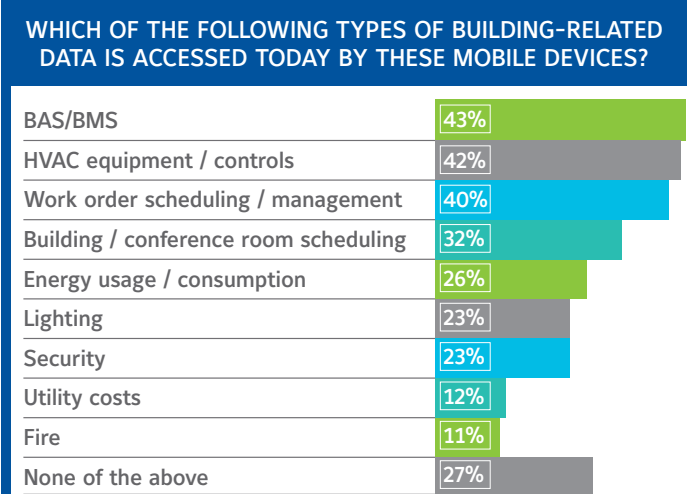
### Visualization Can Drive Improvements in Building Performance

Remember the old adage that a picture is worth a thousand words? That approach, used with data from connected-building technologies, takes complex information and presents it in a visual way, so critical knowledge is immediately conveyed.



Dashboards are a good example. A dashboard provides an up-to-the minute look at how equipment is performing. "Through graphical dashboards that automatically aggregate and update data, service technicians and facility managers gain access to real-time information," says Pramod Dibble, energy and environment research analyst with Frost & Sullivan.

Today, the use of simple visual cues – like the use of red to highlight a problem – and increased customization of interfaces mean building data is no longer represented by numbers and spreadsheets, but offered through rich, interactive graphics. And that's making it easier, and faster, for building managers to find the information that matters.



Source: Johnson Controls

## Conclusion: Smart Connected Services Are Reshaping the Way Building Owners and Facility Managers Approach Service

Smart connected building technologies are offering a compelling glimpse into the future of how service will be delivered. Advanced BAS, smart connected equipment, cloud-based technology and mobility tools are revolutionizing how we gather, analyze, visualize, and deliver data. Smart equipment and buildings can be monitored 24/7 and equipped with trend data, so facility managers don't have to react to crises. Symptoms can be diagnosed prior to problems occurring, reducing downtime, lowering repair costs, and increasing overall operational efficiencies.



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### Sources

"Where Can Smart Equipment Technology Reduce the Headaches?" Report based on a survey of members of the Johnson Controls Building Efficiency Panel. [www.johnsoncontrols.com/insights](http://www.johnsoncontrols.com/insights)

"IT Mobility Survey Findings," Report based on a survey of members of the Johnson Controls Building Efficiency Panel. [www.johnsoncontrols.com/insights](http://www.johnsoncontrols.com/insights)

"Future of BAS." Report based on a survey of members of the Johnson Controls Building Efficiency Panel. [www.johnsoncontrols.com/insights](http://www.johnsoncontrols.com/insights)

For more information on how Johnson Controls can reduce service related downtime, decrease repair costs, and increase operational efficiencies with smart connected services, contact your local branch at [www.johnsoncontrols.com](http://www.johnsoncontrols.com).

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