

Smarter buildings: A smarter way to manage buildings and facilities

IBM and Johnson Controls provide energy and operational savings, space optimization and security



Highlights

- Visualize and control assets, energy use, space, carbon footprint, security and safety
 - Integrate HVAC, power, security, fire, ICT and other systems
 - Reduce operating costs for maintenance and energy
 - Dynamically track and analyze workplace utilization
 - Dynamically track and manage service performance
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Companies are under increased pressure to improve building and enterprise mission performance, energy efficiency and sustainability, including green credentials such as LEED management, accounting, and reporting, and reduction of their carbon footprint.¹ At the same time, organizations are being asked to reduce operating expenses and capital expenditures, including the costs of energy, assets and space. Building owners also want safer buildings while reducing security costs. And stakeholder, financial and regulatory pressures are requiring commercial and public buildings to accelerate efforts to reduce energy consumption, greenhouse gas emissions and utility load demand.

The smarter buildings combined solution offered by IBM and Johnson Controls® to support better management of buildings can deliver, for a large portfolio of buildings, the ability to visualize, analyze and achieve better decision making for optimizing energy and asset use. It can deliver improved performance and help reduce costs by:

- Integrating building systems, infrastructure systems and enterprise systems.
- Implementing energy, sustainability, building, facility, asset, measurement/monitoring and operational improvements, including renewable energy solutions.
- Implementing best business practices and policies.
- Providing users with analytics, advanced intelligence, visualization and decision tool capabilities.
- Integrating physical and network security.
- Integrating service work-order automation management and performance.



The results can include reduced costs, energy savings, regulatory and policy compliance, enhanced asset performance, enhanced physical and network security, increased transparency and predictability, and guaranteed financial and operational outcomes.

The smarter buildings combined solution provides the most benefit for a portfolio of buildings or for large, complex buildings. A building portfolio can be a campus or a geographically dispersed group of buildings across a city, county, state, country or group of countries. The solution can be installed in a new construction project, retrofitted into an existing environment, or implemented in a mixed new-build/retrofit portfolio. It can be implemented all at once or in a multi-phased approach.

The solution is designed to integrate a company's instrumentation/metering, control systems, applications, and information systems. In this manner, it embeds a greater level of intelligence for a portfolio of buildings to provide a top-down and bottom-up view of a company's real estate performance, energy use and costs, and carbon footprint, and to enable effective and intelligent decision making at each level in the organization.

The potential impact is clear:

- Higher energy efficiency
- Carbon reporting, management, and emissions reduction
- Improved utilization of assets and space
- Longer asset life and reduced life-cycle costs
- Improved facility service performance
- Lower operational costs
- A safer and more secure workplace
- "Green" leadership

CABA recognizes the need for smarter buildings

A recent research report² from the Continental Automated Building Association (CABA) explains how the combination of green design architecture and converged infrastructure creates operational efficiencies that enable "bright green" buildings:

"A bright green building is one that is both intelligent and green. It is a building that uses both technology and process to create a facility that is safe, healthy and comfortable, and enables productivity and well being for its occupants. It provides timely, integrated system information for its owners so that they may make intelligent decisions regarding its operation and maintenance, and has an implicit logic that effectively evolves with changing user requirements and technology, ensuring continued and improved intelligent operation, maintenance and optimization. A bright green building is designed, constructed, and operated with minimum impact on the environment, with emphasis on conserving resources, using energy efficiently and creating healthy occupied environments. It must meet the needs of the present without compromising the needs of future generations. Sustainability is measured in three interdependent dimensions: environmental stewardship, economic prosperity, and social responsibility. Bright green buildings exhibit key attributes of environmental sustainability to benefit present and future generations.

"In bright green buildings, fully networked systems transcend the simple integration of independent systems to achieve interaction across all systems, allowing them to work collectively, optimizing a building's performance, and constantly creating an environment that is conducive to the occupants' goals. Additionally, fully interoperable systems in these buildings tend to perform better, cost less to maintain, and leave a smaller environmental imprint than individual utilities and communication systems."

Alliance combines knowledge, experience, technologies and services

Building on a longstanding relationship, including the creation of an energy-efficient data center solution in 2007, IBM and Johnson Controls now offer a smarter buildings combined solution that provides benefits to any organization that owns or manages a portfolio of buildings or large, complex buildings. The offering combines IBM's global leadership in software, hardware and services with Johnson Controls' global leadership in energy efficiency, sustainability, services and building management systems. The solution is designed to help clients address the growing pressures they face to improve energy, asset management, space-use, and safety/security performance across the enterprise.

IBM and Johnson Controls deliver building portfolio value

The smarter buildings combined solution is designed to address critical building performance areas including systems integration, energy management, space optimization, asset management, security, carbon management, building portfolio performance visibility, and enterprise business intelligence, combined with a full range of reporting capabilities.

Convergence of information technology and building systems

The integration of building automation systems, business systems and external systems (including weather systems, smart grid and other technologies) using IBM and Johnson Controls software and integration services offers increased information on the performance of building portfolios to help reduce operating costs and help keep occupants safe and comfortable to enhance productivity. Smarter buildings leverage integration of the complete set of a facility's or an enterprise's disparate building and IT systems, regardless of brand or type, into a single, managed environment.

Energy management

Organizations can achieve significant energy savings across the enterprise through energy management with energy/facility improvement offerings that utilize energy waste

detection, energy/performance analytics, visibility and reporting, intelligent control, and building/facility improvement implementations, as well as technology and programs to change the behavior of building users in reducing energy use.

The combined solution provides analytics to help create actionable information to support building owners, operators, and tenants in reducing energy consumption and waste over the life cycle of their facilities while increasing facility performance. Combined services teams collaborate to implement this solution to manage buildings in a smarter way, including energy/facility improvement projects identified by data capture, analytics and facility assessment, and audit expertise. The integration of asset and service work-order management with energy and sustainability management analytics is a key enabler for reducing energy consumption and carbon emissions, and for sustaining these reductions over time.



The IBM and Johnson Controls smarter buildings combined solution enables an automated, interactive measurement and verification approach for tracking energy usage, cost and carbon management including accounting, reporting and mitigation.

Fault detection and diagnostics (FDD) analytics and periodic commissioning analytics capabilities can help reduce energy consumption and extend equipment/asset life. The ability to automate the identification and prioritization of faults enables automated controls and helps facility staff minimize energy and maintenance costs. Both IBM and Johnson Controls can provide analysis and trending of real-time and historical data, and can provide recommendations for manual or automated actions to mediate or eliminate inefficient usage of energy with ongoing measurement and verification of the effectiveness of those actions. Analytics combined with decision-making rules and decision workflow management can be integrated with facility work-order management systems so that building systems having substandard performance or failures affecting energy efficiency can take corrective action managed by the system. Analytics can be applied to service work-order management activity to identify opportunities for performance, reliability and cost improvement.

Carbon management and enterprise reporting

When combined with IBM's enterprise reporting functionalities, the Johnson Controls' Energy and Emissions Management System provides organizations with the capability to calculate, track and report greenhouse gas levels by measuring, managing and forecasting activities related to energy cost, consumption, energy-efficiency projects, fleet emissions and waste.

Asset management

The smarter buildings combined solution offered by IBM and Johnson Controls can deliver substantial savings across the enterprise through asset management offerings that include assessment services, software, implementation services and management services.

Management of asset performance, asset utilization and life-cycle support is optimized by applying tools and services that enable asset visibility and control across the portfolio of building assets. IBM's asset management solution provides insight into an enterprise's asset portfolio, including asset conditions and asset use, operations, and maintenance work processes. This enables building owners, operators and tenants to better plan and control their environment, outcomes and costs. The result is the ability to improve operational efficiency and asset effectiveness, and to increase facility and enterprise core mission performance.

The combined solution leverages asset management functionality to effectively maintain facilities in today's challenging and changing environment. Asset performance visibility is provided into the facility portfolio and into the nature and volume of work being performed to maintain those sites. By offering a catalog of available maintenance services, with the associated costs and delivery steps, the solution enables consistent delivery and execution of services while helping reduce inaccuracies, reworks and total costs. The solution also allows for a shift in the type of work being performed from reactive to proactive, supporting improved asset performance, longer asset life and ultimately a more sustainable building. A key smarter building component is the industry-leading asset management solution, IBM Maximo® Asset Management.

Space utilization

The combined solution also supports improvements in space utilization by providing the tools and services that enable space-use visibility and performance improvement across the portfolio of buildings. The offering enables implementation of space-use strategies and improvement projects that can result in more efficient use of space. Underutilized space can be identified and more efficient use options recommended, including footprint consolidation, divestiture and relocation. The solution's space-use analytics capabilities and user interface provide actionable information to help building owners, operators and tenants optimize space over the life cycle of their facilities while increasing business performance.

Security

The combined solution also provides integrated physical and IT security that supports reductions in security losses, threat risk and delivery cost, including:

- Creating an atmosphere of safety and security by helping mitigate or eliminate intrusion upon or interruption of privacy, convenience or performance.
- Providing practical, cost-effective safeguards against real threats.
- Enabling or providing sustainable, practical, cost-effective ongoing security operations.
- Integrating IT and physical security systems to guard against both data and physical threats.
- Protecting the continuity of the mission.

The smarter buildings combined solution provides comprehensive security management capabilities, including the ability to identify threats and perform risk assessment, make recommendations for safeguard improvements, and formulate a plan to implement a solution.

These security solutions focus on supporting physical security with capabilities such as intrusion detection, asset protection, identity and access management, and fire detection and alarms. They also support IT security with capabilities such as single sign-on and policy management and enforcement. The implementation and support of these systems—including design, command and control capabilities, hosted solutions and staffing, and maintenance—can also be provided.

Summary

A smarter building requires collaboration between an organization's facilities and information technology teams. Now, an alliance between IBM and Johnson Controls—and the combined solution for smarter buildings that this alliance offers—creates an integrated solution designed to help owners, operators and tenants unlock the value that resides in the convergence of information technology with building controls, energy management and facility operations.



The solution pairs IBM's market-leading information systems for complex asset management, energy management, analytics and integration with Johnson Controls' market-leading building and energy expertise to create an unmatched combination of end-to-end expertise.

The solution offered through the IBM and Johnson Controls alliance enables companies to manage building assets with energy insights and actionable information using a set of pre-integrated applications and middleware customizable for the end user. The result is a solution that delivers savings through automated control functions, process improvement and prioritized energy improvements to the building or facilities.

The impact is clear: Users now have the tools and services they need to reduce both operational costs and carbon emissions, improve utilization of assets and space, offer a safer and more secure environment, and position themselves for leadership in the move to more effective, sustainable energy conservation.

For more information

To learn more about the combined solution for smarter buildings offered by IBM and Johnson Controls, contact your IBM or Johnson Controls representative or your IBM Business Partner, or visit: ibm.com/tivoli/solutions/facilities-management or www.johnsoncontrols.com/publish/us/en/products/building_efficiency.html.

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Performance contracting financial solutions from Johnson Controls can provide guaranteed savings that fund the project while providing positive cash flow throughout the guaranteed life of the solution and beyond. For more information, visit: www.makeyourbuildingswork.com/learn-more/performance-contracting

¹ LEED (Leadership in Energy & Environmental Design) is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

² CABA, "Bright Green Buildings: Convergence of Green and Intelligent Buildings," Ottawa, Ontario, Canada, 2008. www.caba.org/brightgreen



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