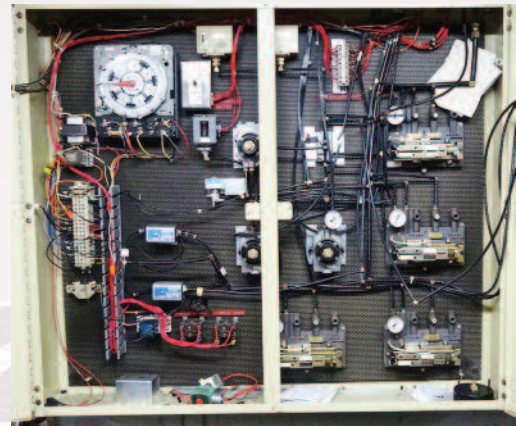# Building Automation Systems Revisited

Building owners look to high-definition sensors, direct digital controls, cloud computing, big data and dashboards to control energy expenses

Obsolete control panels? If your control panels look like this, consider replacing them with networked Building Automation Systems (BAS) that will not only save energy but thousands of dollars on avoided maintenance costs.

By **Douglas Elbinger**,
Energy Systems Analyst, Newman Consulting Group LLC

"**You Can't Manage What You Can't Measure**" … you've probably heard this before. In the real world of facility management and commercial real estate, it's critical to have reliable, real-time data to guide your investment and management decisions. Until recent advances in direct digital controls and computer automation, having a real-time picture of your building operation was near impossible. More often than not, you had to wait until a system "failed" before you knew there was a problem.

Building owners and third-party service companies increasingly manage large buildings remotely, or off their desktops using proprietary software platforms that provide performance monitoring, data analytics, visualization, fault detection and diagnostics, portfolio energy management, and text messaging, all using the cloud. This trend is reflected in the large number of new offerings in building automation services, facility management systems, wireless controls, and building information management (BIM) in the last few years, as well as the spread of energy dashboards, cheap sensors, and a greater awareness of the business case for energy upgrades.

In addition, there is a trend toward cities and states that will demand building performance disclosure. Since the 2007 adoption of the USGBC Architecture 2030 standard—a voluntary program that encourages all existing buildings to cut energy use 50% compared with 2005 levels, and all new buildings to be net zero by 2030—group efforts to cut carbon emissions and encourage voluntary performance disclosure has emerged as a major trend in the United States. Nineteen U.S. cities had functioning 2030 Districts by mid-2017, with three in Michigan (Detroit, Ann Arbor, and Grand Rapids). These initiatives capitalize on concerns over climate change and incorporate values of openness and transparency embraced by many corporate citizens.

In the United States, this trend is highlighted by more than 30 large and medium-sized cities *requiring*—not just encouraging—commercial building owners to disclose actual green building performance to tenants, buyers, and, in some cases, the public. By mid-2015, Boston, New York, Philadelphia, Seattle, San Francisco, and Washington, D.C., had such ordinances. This trend will spread rapidly as the easiest way to monitor reductions in carbon emissions from commercial and government-owned buildings. It will also encourage owners to invest in energy-efficiency retrofits and renovations.

Making Energy Improvements Possible. There is a clear but narrow path between operating cost, environmental quality, and profitability. Computer technology is the key to managing facilities and utility costs effectively. Without these tools, the existing personnel often cannot keep up with increasing demands. Either quality suffers or costs increase in other areas like contracted services, utility charges, down-time or personnel. Technologically, we have reached a point where facility managers rely on automated building management systems and direct digital controls for HVAC, lighting, security and other systems to stay ahead of the game. Building
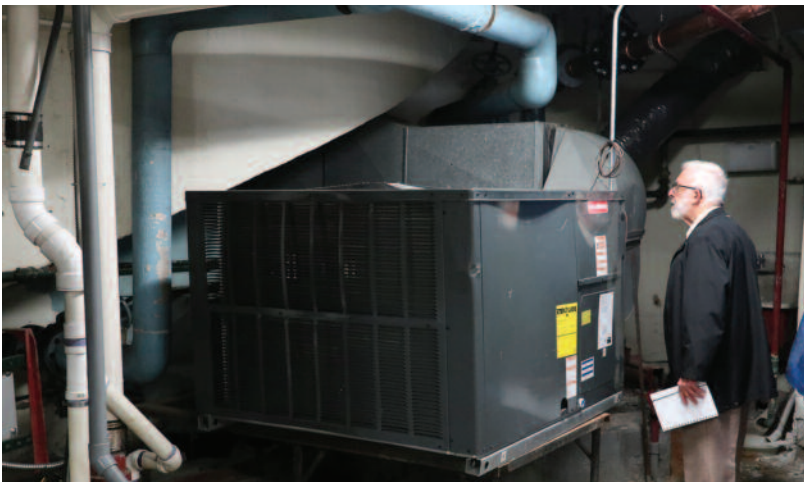
Jim Newman, Managing Partner, Newman Consulting Group, inspects older HVAC equipment in a commercial building. Energy savings can be 15% or more when Building Automation Systems are installed.

owners recognize that energy costs are manageable, and how they are controlled affects an organization's ability to compete.

The immediate benefits of Building Automation Systems are…

Lowers utility costs –
According to the Building Owners and Managers Association (BOMA), an average building automation system typically saves about 15% of the energy cost of mechanical equipment, or from $0.20 to $0.40/square foot.

Maintains measured comfort –
Computerized controls help to maintain even temperatures and lighting levels within the facility to provide measured comfort. Maintaining consistent temperature and lighting levels cuts down on wasted energy.

Enhances property value –
The value of most commercial buildings is related to the net operating income (NOI). Lowering utility costs increases the net operating income on a dollar-for-dollar basis. Every $0.10/square foot saved in energy could increase the market value of the property by $0.80/square foot. A 100,000 square foot building could increase in value by $120,000 by reducing energy costs $0.15/square foot.

Reduces occupant complaints – A more comfortable building means fewer occupant complaints. This means less time resolving complaints, happier occupants, and a more productive business environment.

Increased productivity – Better ventilation, air quality and lighting improve greater worker productivity and less sick

time. The value benefits average $25.00/square foot. With decreased sick days translated into a net impact of about $5.00/square foot and increased in productivity translated into a net impact of about $20.00/square foot.

Simplifies building operation – Computerized controls and real-time graphical displays let you see exactly what is happening with the equipment in