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“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, having reliable, real time data to guide your investment and management decisions is critical. Until recent advances in direct digital controls and computer automation, having a real time picture of the building operation was almost impossible. More often than not, you had to wait until a system ‘failed’ before you knew there was a problem.

MAKING IMPROVEMENTS POSSIBLE

Now there is a clear 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, downtime or personnel. Technologically, we have reached a point where facility managers must rely on automated building management systems and direct digital controls for HVAC, lighting and other systems to stay ahead of the game. Building managers are recognizing that the real costs, and how they are controlled, affects an organization’s ability to compete.

The immediate benefits of Building Automation Systems:

- **Lowers Utility Costs** – According to Building Owners and Managers Association (BOMA), an average building

THE BENEFITS OF BUILDING AUTOMATION SYSTEMS

automation system typically saves about 15 percent 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. 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 and air quality 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 the building without having to go up on the roof or crawl up into the ceilings. This saves on costly diagnostic time and simplifies operations.
- **Reduces Maintenance Costs** - Running the equipment less and controlling it better reduces system wear and extends equipment life.
- **Avoids Business Interruptions** - Unexpected equipment breakdowns can cause very costly business interruptions. The cost of employees and or processes in a building can easily be 50 to 100 times the facility operating cost on a square foot basis. The impact when customers are involved can be equally costly. Breakdowns and emergency repairs are very expensive. Computerized controls monitor equipment status and help you be proactive with regards to scheduling device maintenance.
- **Prudent Investment** –Most systems will pay for themselves in less than two years. Typical numbers for an owner-occupied 100,000-square-foot building are estimated to be as follows:

Total System Cost:	\$200,000	(\$2.00/square foot)
Utility Rebate:	\$30,000	(15% rebate)
Annual Energy Savings*:	\$15,000	(15% savings)
Annual Productivity Loss Avoidance*:	\$50,000	(1% savings)
Annual O & M Cost Avoidance*:	\$10,000	(10% savings)

Total Savings: \$105,000 - Simple payback 1.9 years

Most systems qualify for special PACE financing

*Annual cost avoidance year-over-year

HOW DOES BUILDING AUTOMATION WORK?

- **Graphical Operation** - Simplifying facility operation and integrating data from various systems in a "seamless" manner is best accomplished with a GUI (graphical user interface). This eliminates the need to memorize commands or point numbers, and allows the operator to take a tour of the facility from the comfort of a PC or Smartphone. Most existing systems can be easily upgraded to add this powerful operational tool. Point and click graphics allows everyone see what is going on and taking the 'guesswork' out of proper operations.
- **HVAC and Lighting Controls** - Stand-alone computerized controllers are installed to take over the control of building HVAC systems and lighting. The building is not only scheduled more closely but it is also operated more intelligently and efficiently.
- **Outside Air Optimization** - Proper control of outside air provides necessary inside air changes for occupant comfort and health, minimizes energy costs by space pre-conditioning, allows for Enthalpy-based* free cooling, and reduces the use of outside air when it is not needed.
- **Coordinating Equipment** - Operating a building system, so that equipment works together, saves energy and improves comfort. Individual control systems that are not centrally monitored and coordinated can conflict or malfunction, causing comfort problems and wasting considerable energy. BACnet based BAS can interface to existing or planned systems so that the building will run smoothly and at peak efficiency without expensive duplication of controls or unnecessary replacement.
- **Direct Digital Controls (DDC)** - Upgrade older existing equipment to DDC to match new equipment functionality. These controllers come standard on most new mechanical systems and are more reliable, require less maintenance, provide more sophisticated control, and are less expensive to purchase and operate.
- **Tighter Scheduling** - Conventional controls, such as time-clocks, are inaccurate and are typically setup to run equipment longer than is actually needed. By automating this function with computerized controls, the computer can predict the optimum start/stop time to equipment and eliminate waste caused by excessive runtime. Incremental savings start to add up.
- **Smarter Control** - HVAC equipment is typically sized to handle the building load under worst-case conditions. Most conventional controls are set up to meet these design criteria at all times. With the automation system, control set points and strategies can be adjusted to meet only the actual load, eliminating unnecessary waste.

*Enthalpy is the amount of heat content used or released in a system at constant pressure. It is usually expressed as the change in enthalpy.

CASE STUDY

Jackson College, Jackson, MI, called on CAM Member the T.H. Eifert Company, Lansing, to inspect the campus of seven buildings that are all being metered off a single meter for gas and electric, and to propose a solution that will meet the energy saving goals of the college. The challenge was to install sub-meters on each building and integrate the existing building automation system (BAS) with a cost-effective control method. To accomplish this task, T.H. Eifert chose to introduce BuildingLogiX®, a Building Automation and Energy Management technology relatively new to the Michigan marketplace.

"We recognize that a company's portfolio of buildings are a major asset and what it takes to heat, cool, ventilate and provide adequate lighting for them is a major expense," said Tom Eifert. "Our BuildingLogiX technology helps the business owner control costs and to



▲ Tom Eifert, president, who founded the company in 1975 with his wife, Connie, demonstrates 'How to Manage what You Can Measure' using the BuildingLogiX® system. Tom emphasizes, "We have evolved to focus beyond just HVAC. More of our attention is directed toward ways to help our customers reduce their energy consumption and lower their ownership and operating costs."

improve the buildings' comfort systems."

Without totally replacing the existing systems, the features of BuildingLogiX are integrated to help better understand the operations of the building systems and effectively manage those systems. The results are improved building comfort and a reduction of utility consumption in excess of 15 percent per year. Savings that are well beyond the capabilities of the existing proprietary BAS.

One of the most valuable aspects of the BuildingLogiX solution is that it is "open protocol" and "non-proprietary," Eifert said. And, it integrates very well with nearly all existing building control systems. The technology enhances existing control systems bringing useful management tools for the company's facilities manager that include TrendView®, EcoRate®, EnergyLogiX®, Report Cards, and much more.

For more information about BuildingLogiX, contact T.H. Eifert Mechanical Contractors, LLC at (517) 484-9944 or visit www.theifert.com. ☑