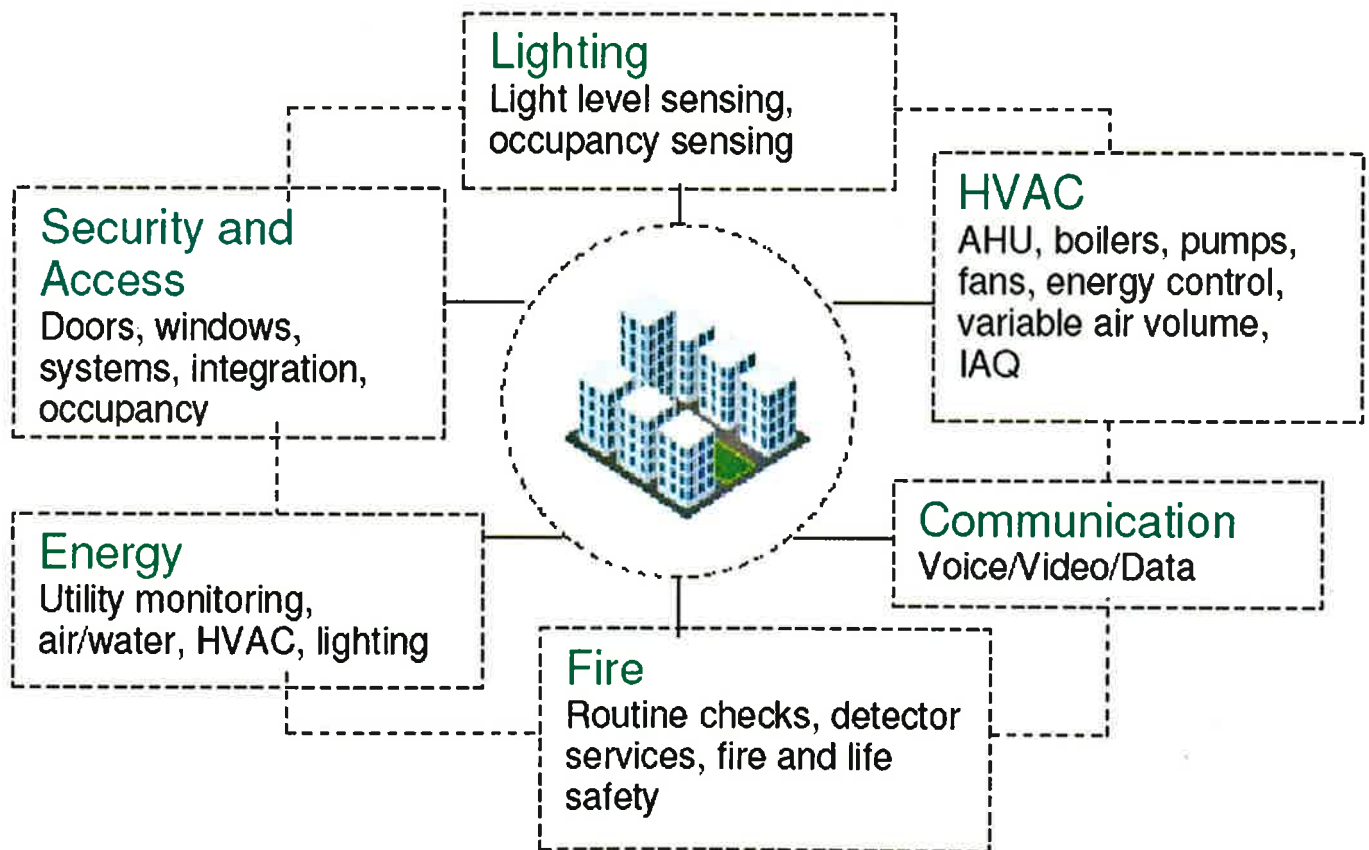


Control Buildings, Control Costs

Intelligent, green building technologies lower overall building costs



A typical Building Energy Management System

Commercial and residential buildings consume about one-third of the world's energy. If current trends continue, by 2025, buildings worldwide will be the largest consumers of global energy, using as much power as the transportation and industrial sectors combined. Recent studies have found that improving energy efficiency in buildings is the least costly way to reduce a large quantity of carbon emissions. By changing energy

management practices and instituting technologies that enhance energy efficiency, building owners and managers can reduce energy consumption by up to 35 per cent. Today, office buildings use about 16 per cent more energy per square foot than those built 25 years ago. The total amount of energy used by commercial buildings has risen significantly since the 1980s, reflecting growth in the total amount of office space

available and a massive increase in energy consumption per square foot of space.

In an era of volatile energy prices and increasing concern over climate change, the need for the innovative application of technology has become highly acute. Energy costs represent about 30 per cent of an office building's total operating costs, providing enormous opportunity for building owners not only to reduce operating costs but also to make ... 22

20 significant improvements in the overall environmental performance of their properties. In order to achieve breakthrough improvements in energy efficiency, it is evident that investments in building automation systems and building energy management systems are required.

Buildings with integrated intelligent building technologies can save thousands

and even millions of dollars in energy by delivering heating, cooling and lighting more efficiently. Intelligent buildings are increasingly using solar walls to capture energy from the sun, ventilation systems to recapture and reuse heat, insulation strategies that enable better climate control, high-efficiency lighting systems that enhance illumination with

less electricity and automatic systems that control building services based on activity. It is becoming increasingly common in the United States for more advanced, intelligent and green buildings to routinely reduce energy usage by as much as 50 per cent over conventional buildings, with the most efficient buildings currently performing up to 70 per cent better than conventional properties. Such green building technologies include building automation systems (BAS) and building energy management systems (BEMS).

For this reason, the Continental Automated Buildings Association has moved to reduce the environmental impact of buildings by promoting such technologies and undertaking research that documents its benefits. CABA is a 20-year-old international industry association, composed of about 350 corporate members, dedicated to the advancement of intelligent home and intelligent building technologies.

Building automation systems and building energy management systems are designed to provide centralized oversight and remote control over heating, ventilation and air conditioning (HVAC) systems, lighting and other building systems. In simple terms, a BAS is a programmed, computerized network of electronic devices that are employed for control and monitoring of systems. It primarily aims at optimizing the performance, start-up and maintenance of systems and greatly reduces the interaction of mechanical subsystems in a building. BEMS basically performs the same functions as a BAS but varies more in capability and functionality. Both BAS and BEMS integrate all aspects of a system and take it right up to the user-interface level from where the operational activities in the various subsystems can be monitored.

It is at the bus level, where data is taken from a device to the controller and then taken on the network, that there exists the option of choosing various building automation communication standards. Standards primarily aim at

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optimizing the performance, start-up and maintenance of building systems. They greatly increase the interaction of mechanical subsystems in the building. This leads to improved occupant comfort, optimum energy consumption and cost-effective building operation. All these can be done remotely or from a centralized system with a minimum “human-in-loop” factor. The lack of the human-in-loop ensures that chances of human error are greatly reduced.

BAS and BEMS are primarily used to improve energy efficiency by monitoring the temperature inside and outside buildings and controlling boilers and coolers. Essentially, they aim at optimizing energy consumption by employing a control strategy that integrates various energy-consuming units. Energy management systems help building owners and operators reduce energy costs, while maintaining occupancy comfort.

A typical BAS/BEMS carries out the following functions: the optimization of start/stop of systems; the scheduling of maintenance; predictive fault detection; alarm generation and preventive actions

minimizing damage in the case of emergency; and the constant monitoring of systems to detect abnormal operating conditions, in order to take corrective action and bring the system back to normalcy.

BAS and BEMS vary in capability and functionality, but typically consist of sensors, controllers, actuators and software. Depending on whether a human-in-loop factor is involved, decisions are taken manually or by utilizing embedded intelligence such as decision-making algorithms.

For more information about the benefits of utilizing intelligent, green building technologies, such as BAS and BEMS to lower overall building costs, consider downloading CABA's comprehensive report on “bright” green buildings. The report features several real-world examples that show how property companies around the world have employed advances in green building and networking technologies to increase profits, lower costs, and help the environment. According to Peter Templeton, Senior VP of Education & Research at the U.S. Green Building

Council, the report “provides the entire building industry with a useful primer and discussion about the role and performance benefits of integrated control systems in green buildings. The conclusions of the study help advance progress toward achieving our vision of a sustainable built environment within a generation.” Peter van der Stok of Philips Research Laboratories Eindhoven states: “I recommend this CABA report often, because it contains a wealth of information.” The report is available for free online at: www.caba.org/brightgreen.

CABA recently also released a comprehensive North American market sizing study, examining intelligent and integrated building technology. The study provides an in-depth analysis of the growing North American markets for integrated and converged intelligent building control systems ranging from environmental control technologies, to fire detection, to security, to lighting systems, to IT convergence. More information about that report is available at: www.caba.org/market-size-2010 **GBD**

Rawlson O'Neil King is CABA's Communications Director.