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INTELLIGENCE IS 'GREEN'

Jawahar Ali explains through examples how energy use can be managed in a better way to improve efficiency. Several new buildings are built on these principles

Thermal power generation plants produce a significant amount of greenhouse gases. These gases are the root cause of global warming. By reducing the consumption of electrical energy, we can reduce the emission of greenhouse gases in the environment. But how do we reduce or optimise energy consumption? The answer lies in Intelligent Building Management System (IBMS).

For example, the buildings in France consume maximum amount of energy, thus accounting for 43 percent of the country's annual energy expenditure. Similarly, in a fast growing economy like India, infrastructure for shopping complexes, malls, multiplexes, hypermarkets, housing societies, etc. consumes huge chunks of energy. To reduce energy usage and save money, an eco-friendly building automation system is essential that can help intelligently and effectively manage a building's energy usage.

Buildings have a large number of subsystems such as lighting, security (video surveillance and access control), elevators, power, safety and HVAC connected on control networks. These systems are crucial for efficient functioning of a building. But most of them operate separately or, at best, are connected through a series of costly, hard-to-maintain gateways having a single human-machine interface. Such conventional systems are proprietary and difficult to optimise for energy efficiency and management.

Today, the designs of IBMS favour open platforms that allow systems and components from different manufacturers to integrate and share information on a common platform. Open systems are created using products from multiple vendors that conform to uniform industry standards, enabling full interoperability across a unified network. With an open standard system in place, as new portions of a building are upgraded or entirely new buildings are added to a campus, users can pick products and services with lower life cycle costs from any vendor they wish to choose.

IBMS effectively centralises important building functions with shared information, increasing safety and improving efficiency since fewer people and systems are required to manage the infrastructure.

Integration between different systems having dissimilar functions poses design challenges for systems integrators. Interoperability (ability to exchange and use information) between different systems is an important factor in a modern building. This is because modern buildings are a combination of various systems that must work

together seamlessly for optimum performance and safety.

For example, when a building is on fire, communication between different systems is crucial for safe evacuation. Interoperability allows the infrastructure to function smoothly by initiating measures such as altering ventilation to prevent fire from spreading, deactivating access control systems for urgent evacuation and activating alarm.

Another example would be the integration of building and office systems that allows communication between systems such as hotel management system, HVAC and lighting equipment. When a conference room is reserved for a particular date and time, the lighting and air conditioning is switched on when the room is scheduled to be occupied.

By using Open Standard systems, which can interoperate with other devices in the same control network, one can significantly reduce the energy usage in buildings. IBMS can be used to control the lighting and the heating, ventilation, and air conditioning (HVAC) subsystems. Motion and occupancy sensors installed throughout the building will help control HVAC and lighting according to the number of people present in the building, the time of day, as well as external conditions such as available natural light and outside temperature.

Each system can be integrated together using open standard framework. This integration will help control various systems from the central command centre. Information captured by one system can be used to trigger action on another system. For example, you can configure motion detection to switch on or off the lights and air conditioning. You can control the Venetian blinds and lighting system together to optimise the luminous intensity inside the room. You can optimise the usage of elevators based on the time of day, pre-configured schedule or motion detection system. You can control the level of cooling by counting the number of people present in the room using video surveillance systems. Thus, IBMS also provides optimal comfort conditions in the building.

Since IBMS monitors energy use precisely, we can better manage its consumption and improve the efficiency. There are examples when up to 30 percent energy savings was achieved using IBMS. Most of the new buildings built on these principles are often called green buildings or environment friendly buildings.

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