How building owners can ensure safe, sustainable workplaces

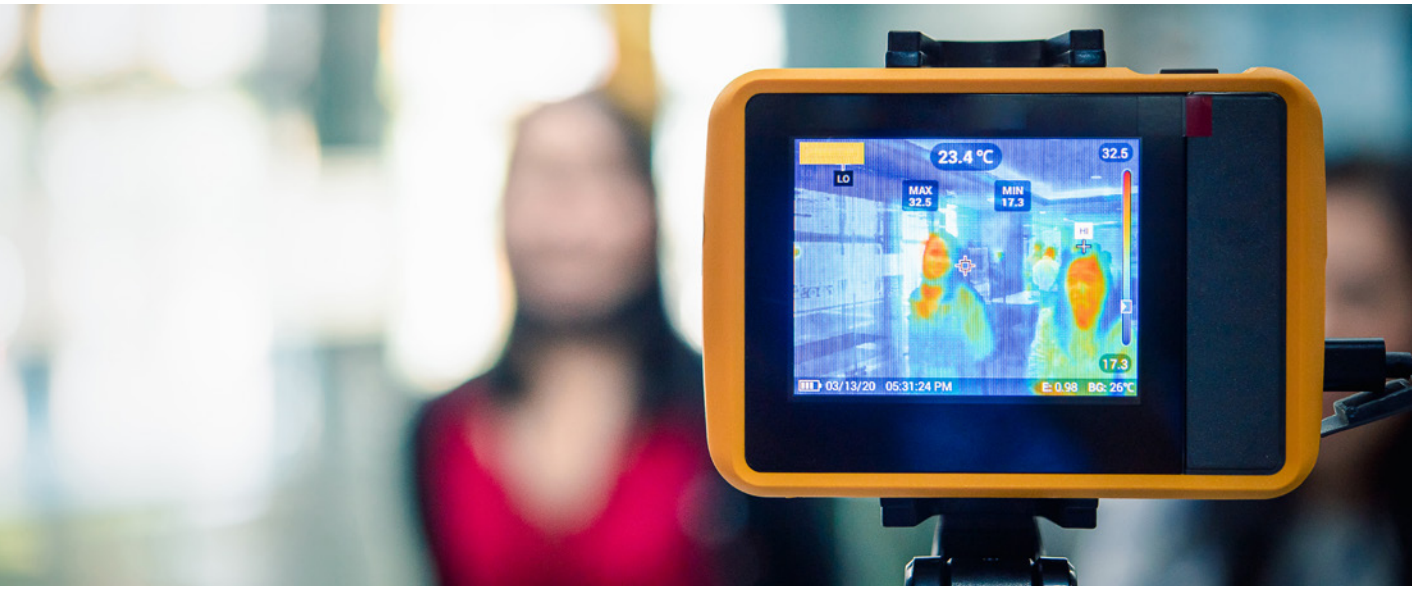
Technological solutions help owners optimize their investment while providing a building's tenants, workers and visitors that the facility is a safe and healthy environment.

Building owners have been required to quickly adapt to a world where tenants, workers and visitors require the assurance that a building is well-ventilated, set up for effective social distancing, and that surfaces are clean and free from pathogens—all the while making purchasing and other mission-critical decisions that have the potential to either make or break the bank. The need to remain diligent and accelerate the adoption of safe and sustainable smart building practices and technologies is expected to continue indefinitely.

Owners can protect their investments by implementing specific measures that include highly functional filtration systems, touchless building controls, thermal imaging cameras, and systems that can measure body temperature automatically and even deny access to individuals who may pose a health risk to others. Outreach efforts to communicate to all people involved that their building environment is safe, and technologies that ensure energy efficiency and tenant satisfaction, are equally vital.

Although many people have been working from home over the past year, most will inevitably return to workplaces that have been retooled to ensure health and wellness. In the United States, many workers express the desire to return to the office while maintaining the flexibility and privacy of working from home, according to a Gensler survey[1] of over 2,300 respondents. In fact, over half of those surveyed would prefer a hybrid work model, working part of the time at home and the rest in the office.

Owners can protect their investments by upgrading to highly functional air filtration systems, touchless controls, and thermal imaging cameras



Promoting healthy workplaces

Building owners must respond to this need and thereby support the productivity of a tenant's workforce. They must also act diligently to provide environments where workers and other building users can retain their sense of security. Stricter hygiene protocols are simply a new way of life, such as measures to reduce congestion at potential traffic bottlenecks like elevators and escalators, social distancing measures, the promotion of handwashing, sterilized surfaces, and more robust ventilation. Technology solutions for smart buildings go a long way to ensuring workplaces are as safe and sustainable as possible.

"Sensors are going to have to play a major role," said Michael Owen, a Tokyo-based real estate consultant and a member of the Japan Cabinet Office's Future City Promotion Council. He cites examples such as airports, which are deploying sensors that can detect elevated body temperatures among groups of people, eliminating the need for individuals to stand in front of a camera one at a time. "What that means for building owners is providing buildings with sensors. There's a need for a powerful sensor installed in office and restaurant entrances so people are flagged if they have a temperature. If that happens, it will provide a high degree of security[2]." he said.

Contactless use of doors and elevators has become more important than ever, as has the need to identify a partner with the expertise and technology solutions that a building owner needs. Mitsubishi Electric has developed the Hygienic Touch Operable Aerial Display that allows users to operate a touch panel in mid-air without actually touching anything. For instance, people visiting an office building can use the Aerial Display to call up their destination floor from the lobby. By combining retroreflective high-resolution aerial image display technology and sensor technology that detects the spatial position of the hand, users can intuitively operate a virtual touch panel without the need to press a button.

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Highly accurate touch detection is achieved by acquiring three-dimensional positional data of the user's hand with an infrared camera. Audio and visual feedback confirms the selection, providing an intuitive interface similar to that of traditional touch panel screens. Furthermore, no biometric information, such as fingerprints which could be indirectly extracted, is left on the screen, and only the user is able to view the screen, which provides high levels of confidence in terms of security[3].

Managing the flow of people

In addition to body temperature and contactless interfaces, smart building managers need to monitor traffic congestion. This goes beyond asking building users to limit the number of people who use elevators. The managers are best served by a comprehensive solution.

AI, big data, and remote maintenance help reduce congestion, while specialized ventilation equipment ensures proper air exchange

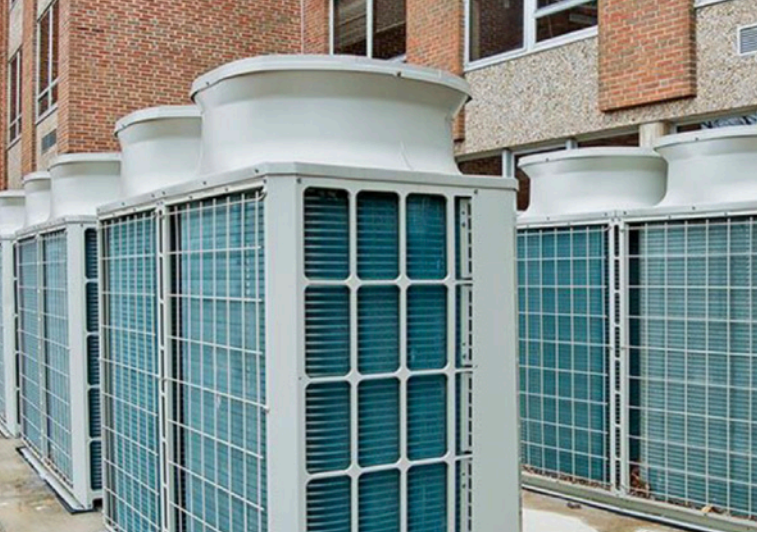
Artificial intelligence, big data and remote maintenance are being combined to help reduce congestion. In 2019, Mitsubishi Electric launched the M's BRIDGE service in markets in Asia. Utilizing the company's IoT expertise and Maisart AI platform, M's BRIDGE features 24/7 remote monitoring of elevator operations and automatic detection of failures, as well as remote analysis of failure data and identification of causes to facilitate rapid repairs. This contributes to improved safety, peace of mind and convenience for building users.

What is more, the service provides automatic detection and alerts, even for minor signs of potential malfunctions, to enable maintenance engineers to prevent elevator failures ahead of time. Finally, it offers efficient, high-quality maintenance based on collection and analysis of remote inspection data that maintenance engineers can utilize during regular onsite inspections[4].

Managing indoor air quality

Earthquake-prone Japan has long been at the forefront of setting standards for buildings that are resilient and safe. HVAC makers have also been doing this for ventilation, which is another important element of smart buildings. In March 2020, Japan's Ministry of Health, Labor and Welfare issued guidelines stating that each person should get 30m^3 ventilation per hour. This is up from the 20m^3 as stipulated by Japan's Building Standards Act. Mitsubishi Electric offers a complete package of ventilation, air conditioning, and lighting with ventilation technology that provides proper ventilation throughout a building[5].

One component of the solution is a special duct ventilator, released in November 2020, the industry's first with a built-in CO_2 sensor. It detects how crowded a given space is and automatically adjusts the ventilation to ensure that CO_2 levels do not exceed safe limits. While it enhances the amount of ventilation only when people are present, it limits inefficient use of electricity by air conditioning, one of the largest uses of energy for commercial facilities. On average, 39 percent of energy use in commercial buildings is by HVAC systems, according to Carl Ian Graham, P.E., of Viridian Energy & Environmental, Inc., in a WBDG report[6]. High-performance HVAC systems can save 10 to 40 percent of energy, emissions and costs, and even greater savings up to 70 percent are possible through whole building design.



The duct ventilator works with Mitsubishi Electric's Lossnay ventilation system, which has been developed and refined over the past three decades. Lossnay has perfected the recovery of waste energy. The units reduce overall energy costs by extracting stale air and then recovering the heating or cooling energy to either warm or cool incoming fresh air. By utilizing this energy, the Lossnay can save up to 30 percent on initial capital costs of heating and cooling[7]. Lossnay is part of a suite of HVAC solutions from Mitsubishi designed to maximize sustainability.

Variable refrigerant flow (VRF) is an HVAC technology that provides energy-efficient comfort control for a building's occupants according to the needs of various zones throughout the facility. Supported by integrated controls and sensors, VRF accomplishes cooling and heating through the transfer of conditioned refrigerant between one or more of each zone's indoor unit and an outdoor unit. As the name Variable Refrigerant Flow indicates, VRF systems are able to modulate the flow of refrigerant so that the system only uses the precise amount of energy needed to meet each zone's needs. The global trend toward a more sustainable, but technologically advanced built environment is a key driver for VRF system adoption[8].

Summarizing the new attitude toward safe, healthy buildings, Michael Owen said, "It all comes down to automated systems, good circulation, and using technology to increase efficiency."

Protecting the building owner's investment

A commitment to quality maintenance is crucial to ensuring a safe and sustainable environment for smart buildings. Building owners can rest assured that their investment is optimally protected when they choose quality design and manufacturing combined with highly skilled professional maintenance teams.

"Mitsubishi Electric is an incredible partner involved in all aspects of what we do," said Stan Taeger, director of South Coast Plaza, a retail and office facility in Costa Mesa, California, which includes the largest shopping mall on the U.S. West Coast. "They maintain our elevators, our escalators, our hand dryers and the HVAC systems. As part of our energy-conserving programs, we installed Variable Frequency Drives, and they do that in as high-quality a way as possible such that we don't even think about those systems. They're taken care of for us by Mitsubishi[9]." he said.

A commitment to quality maintenance is crucial to ensuring a safe and sustainable environment for smart buildings

In the era of green building technologies, the need for accurate information on trends to predict costs will not change, nor will the need to implement technologies to reinforce building safety. Conveying the significance of these solutions to tenants, workers and other users is another must for building owners.

From smart building access and monitoring to contactless interfaces and indoor air quality management, Mitsubishi Electric is structured to support building owners with a comprehensive suite of solutions that will help protect investments while futureproofing for the long run, while also ensuring an environment that is both healthy and sustainable. With a whole range of products for all sorts of uses in offices, hotels, stores, restaurants, schools, hospitals and factories, Mitsubishi Electric's green building solutions provide real solutions that meet short-, mid- and long-term needs.

References

(1). GENSLER RESEARCH INSTITUTE:"US Workplace Survey 2020 Summer/Fall" https://www.gensler.com/research-insight/gensler-research-institute/us-workplace-survey-2020-summer-fall

(2). December 2020 online interview with Michael Owen, CEO of Transpacific Enterprises, a Tokyo-based consultancy that develops PR strategies for real estate developers, investors, and government officials

(3). Mitsubishi Electric Corporation: "Touchless Interface Solution to Ensure Hygiene Control and Secure Operation Needs" https://www.mitsubishielectric.co.jp/me/convention/ceatec2020/en/industry/

(4). Mitsubishi Electric Corporation: "Mitsubishi Electric and Mitsubishi Electric Building Techno-Service Jointly to Launch M's BRIDGE™ Global Remote-maintenance Service for Elevators" https://www.mitsubishielectric.com/news/2019/pdf/0926-b.pdf

(5). Mitsubishi Electric Corporation: "Changing closed spaces into places of comfort, Mitsubishi Electric's New Normal Solution" https://www.mitsubishielectric.co.jp/me/convention/ceatec2020/en/life1/

(6). Mitsubishi Electric White Paper: "Building for Efficiency: Systems Approaches Boost Profitability"

(7). Mitsubishi Electric Corporation: "Lossnay Energy Recovery Systems" https://www.mitsubishielectric.com.au/2096.htm

(8). Mitsubishi Electric White Paper: "Getting Started With VRF," 2019

(9). Mitsubishi Electric USA: "See Why South Coast Plaza Partnered with Mitsubishi Electric"; https://www.youtube.com/watch?v=Zam32E2csy0