



# Building the New Normal into the New Better

Sometimes the best-laid plans go out the window. In 2020, a global pandemic and the corresponding economic upheaval changed much of what we took for granted up to that point. In addition to the businesses that suffered and jobs that were lost, many large facilities, especially entertainment and sports venues, sat empty and unused for most of the year. A new normal rapidly emerged, one where the utmost importance is placed on the health and wellness of building occupants and users. It's a situation that also requires a combination of technology-based solutions and creative thinking to maintain a sense of normalcy and sustainability in the building development and management sector. There is, however, no reason that the new normal cannot inspire a new better.

"As the COVID-19 pandemic has emptied offices across much of the world and some workers are reluctant to return there is a need for smart building initiatives to help repopulate them," said Brian O'Rourke, writing for S&P Global Market Intelligence<sup>(1)</sup>. He suggests that many new work-from-home employees may want to stay home after the pandemic has ended, and others may be willing to return but have safety concerns about going back to the office.

The 451 Research survey "Voice of the Enterprise: Coronavirus Flash Survey June 2020<sup>(2)</sup>" conducted in mid-2020, a web-based

query of 575 IT decision-makers, indicates that 67 percent of organizations expect that expanded or universal work-from-home policies implemented in response to the outbreak will remain in place permanently. In addition, 47 percent of all companies surveyed expect to reduce office space, with 20% expecting to reduce it by more than 25 percent.

According to O'Rourke, in addition to its effect on the overall market, the coronavirus pandemic also depressed the smart-building market. When offices are empty and the economy is struggling, capital for both new buildings and retrofits is scarce, disrupting smart building initiatives. Commercial real estate managers as well as hardware and software vendors

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*Plans and product choices must comply with the emerging post-pandemic world in order to satisfy star tenants*

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must adjust their plans and product choices to make them comply with a post-pandemic world that merges. They will be looking to prove their value to current and future tenants. While this situation sounds perilous for the commercial real estate market, smart building strategies may help bring employees back.

## Health, wellness and safety

Michael Owen, CEO of Transpacific Enterprises<sup>(3)</sup>, a Tokyo-based consultancy that advises real estate developers, investors, and government officials, noted that a mix of technology solutions and modified behavior is simply the new way of life. “The demand is now going to be, how to heighten the worker's experience through data, electrical solutions, and sensors,” says Owen, who regularly interacts with decision-makers across a broad swath of the building and development sector and is a Future City Promotion Council Member of the Japanese Cabinet Office directly involved in major building projects.

Building owners face a host of issues. According to Owen, in addition to the health and welfare of tenants, building owners must think about a myriad of factors. These include sensors and automation to track people, monitoring building usage and reducing user congestion in bottleneck areas, regular sterilization of surfaces, making sure windows can be opened, improving overall airflow and ventilation, elevators and HVAC systems, data analysis, and the ability to adapt technology to new situations.

Commercial real estate managers as well as hardware and software vendors must adjust their offerings to make them more attractive in a post-pandemic world. They will be looking to prove their value to current and future tenants and customers, both in terms of saving them money, and in easing the transition of people back into the office by helping to ensure safety and wellness.

With the proper expertise, holistic air-quality solutions can also improve return on investment through proper configuration of HVAC technology. HVAC generally accounts for 10-40 percent of an average building's energy usage, and high-performance HVAC systems can theoretically save up to 70 percent of a building's energy costs, according to data from Mitsubishi Electric<sup>(4)</sup>, a company that works with multiple stakeholders in the building development industry to manage costs and optimize investment in equipment

and operations. Technology such as variable-frequency drives (VFDs) can deliver maximum efficiency and reliability while reducing energy consumption in new and old equipment.

**K**eeping the cost of equipment downtime as low as possible is mission-critical for profitable building management of buildings. People need to be quickly—and unfailingly—moved via escalators and elevators, and uninterruptible power supply (UPS) systems must be relied upon, even in extreme weather conditions or unforeseen events like earthquakes. Mitsubishi Electric Building Solutions provides predictive

maintenances services, which result in some of the highest levels of reliability in the industry, as well as a wide variety of equipment and multidimensional solutions that deliver high efficiency, scalability, and reduced total cost of ownership.

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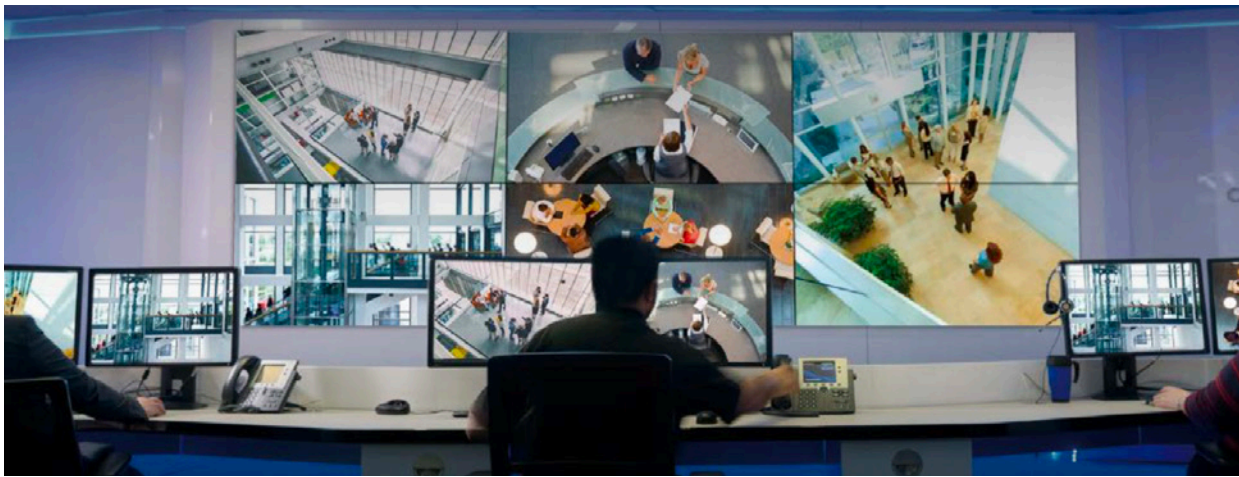
*Holistic air-quality solutions can improve ROI through optimized configuration of HVAC technology*

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A high-performance HVAC unit with a high coefficient of performance (COP) — a rating that measures how much heating or cooling is generated compared to how much work is required to generate it — paired with energy-efficient variable refrigerant flow (VRF) technology, which circulates varying amounts of refrigerant, only as needed, can be optimized based on demand differences across a 24-hour cycle.

Because many spaces do not always need the maximum amount of cooling, the system need not work so hard. Tenants are more comfortable because they are no longer limited to either heating or cooling, and in fact are able to choose optimum comfort levels. The same VRF system can deliver heating to one office and cooling to another. Variable frequency drive (VFD) controls can further boost savings by making pumps and fans work to circulate air or coolant during part-load conditions<sup>(5)</sup>.





## Situational analysis and building traffic management

Control rooms have taken on even greater importance, due to social distancing rules, the need for contact tracing, and overall security concerns. A leader in media for control rooms, Mitsubishi Electric offers display systems that compile data and video feeds from cameras and networked devices, helping management to stay informed and connected with activities on every floor and right outside the building.

Improving elevator traffic management has also become an area of concern, as people need to feel safe in confined space. According to a study by Mitsubishi Electric on how building systems can boost profitability, building administrators and occupants can employ either floor-access control or automatic call registration to improve and control elevator traffic. This is especially important for contending with social distancing and keeping congestion to a minimum.

Floor-access control limits passengers' choices for floor number selection, based on credentials programmed into their ID proximity cards. With automatic call registration, the proximity card and reader panel direct the user to an elevator car destined for an authorized floor number. Both are efficient, automated approaches that advance not only functionality but also elevator design. Inside the cars, socially distanced passengers select their desired floors without the need to touch anything<sup>(6)</sup>.

Another important elevator technology enhancement is the Destination Oriented

Allocation System (DOAS), which optimizes multicar elevator systems by allocating cars efficiently according to the floors that passengers select while waiting, helping to reduce both wait and travel times.

DOAS technology cuts average wait times by up to 30 percent during congested hours, and reduces long waits (those of 60 seconds or more) by up to 60 percent during peak times<sup>(7)</sup>.

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## Building for operational efficiencies and worker safety

According to Michael Owen, building developers are faced with new pressures to look beyond a development project and consider operational efficiencies at the day-to-day level of building management. He said, "In building integration, it all comes down to, how do you encourage the personnel there to be as efficient as possible? If you can pull that off and create this environment where the workers are well treated and feel safe, then the whole system functions as smoothly as intended."

Technology and processes can provide that kind of support. During the construction phase, more efficiency to maintain schedules requires the cooperation of the workforce. Open communications with, and better

management of the workforce, including redundant teams for instant back-up, can ensure that workers are treated well and feel safe on the job. Using digital twins, or virtual clones of buildings to improve efficiency is becoming the norm, and automation and sensors help in the understanding of traffic patterns within facilities<sup>(8)</sup>. A digital twin is a digital modeling of potential and actual physical assets, processes, people, places, systems and devices used for a wide range of building control and efficiency issues. Using elements of IoT software, the complete lifecycle of building elements can be managed from a single reference point.

Proper application of the digital twin can serve to reliably predict service requirements, improving operational efficiency and reducing downtime, making it easier to transfer useful live information without additional programming. Operational metrics include data from third-party testing of building system properties; manufacturer history and track record; product benefits; and economics, including historical first-cost, operating-cost, and total-cost-of-operation data and references from those who have already used the product.

**B**uilding security can also be enhanced through user management practices where destination dispatch systems are combined with a separate access-control system integrated with the elevator control system.

Tenants can authorize visitors independently, and without the need for additional building resources to manage the process, which reduces building management overhead costs. Investing in quality vertical transportation not only enhances the end-user experience in buildings, but also has a dramatic impact on long-term profitability.

According to Rachel Novotny, writing for the online publication Esub Construction Software<sup>(9)</sup>, building information modeling, or BIM, a growing construction industry trend, is a way of representing buildings, roads, and

utilities through computer-generated images to help contractors visualize a construction process before it is built.

Architects and engineers can use the models to visualize how building materials will hold up over time and in times of trouble. Subcontractors can better visualize their part of the project and anticipate specific material needs. They can also identify building-wide areas for energy efficiency and use, what-if scenarios to optimize water requirements and energy levels, reduce waste, and cut the long-term costs of running the building.

Architects can also apply innovative design approaches—including vertical transportation, HVAC and UPS systems and IoT—to bring new efficiencies, more control and competitive

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advantages to clients. An increasing number of architecture and engineering firms, construction managers and contractors recommend specialized expertise using outside procurement and contracting methods to benefit the client over the long term. Many of the approaches are customized and exclusive, giving the client peace of mind while motivating suppliers to create new value.

Smart buildings are expected to continue to be at the forefront of new development, providing greater connectivity in building systems. Because buildings contain complex HVAC systems as well as control systems that can improve the safety, comfort and productivity

*Support from the supplier-partner is essential to reducing TCO and maximizing return on investment*

of building occupants, smart building technology can provide the means for greater levels of integration between existing building systems.

According to studies by the online magazine Senseware<sup>(10)</sup>, the smart-building trend is expected to increase as open standards continually pave the way for new developments. Moreover, smart buildings have the capacity to connect people with technology. Smart building technology can assist in facility management, while providing valuable insights into the use and enjoyment of the building spaces. Energy efficiency, building sustainability, and workforce management efforts will all benefit.

## Macro and micro perspectives of industry stakeholders

In many markets worldwide, industry consultants play a vital role in keeping building owners abreast of the trends and technologies that impact profitability and optimum management of a facility. Consultants can greatly influence plans and purchasing decisions, so they need to keep a broad perspective, including insights on building solution trends and the overall construction market landscape.

"With consultants, right now the focus is on the digital twin and how you program wellness and resilience, including alternative energy, into the building or development," said Michael Owen. "Consultants with skills in those areas will have an edge."

In the building development stage, the supplier-partner is essential to reducing total cost of ownership and operations, as well as maximizing return on investment. In some cases, the building owner-developer may benefit from single-source or sole-source contracting agreements. Single-source approaches—such as those offered by Mitsubishi Electric Building Solutions in HVAC, vertical solutions and other areas—give owner-developers a great advantage. Mitsubishi Electric's integrated array of key building systems make it an ideal supplier-partner to work with, especially if the current systems prove inadequate.



Sole-source contracting can reduce administrative costs, as well as the time needed for the manager to contact various vendors, to solicit pricing and negotiate operating agreements. According to leading commercial owners and developers, the basis for either type of partnership agreement must focus on four things: The first is the installed system lifetime horizon; the second is equipment reliability and maintenance track record; the third is system-design impact on operating expenditures such as energy use, replacement parts and disposal costs; and the fourth is the likelihood of unplanned expenditures—“surprise costs”—such as a pandemic or other natural and manmade disasters, which exacerbates system predictability.

“The biggest question for applying contracting technologies is always the follow-up,” said Michael Owen<sup>(1)</sup>. “That’s a place that consultants can focus on.”

**F**or the next three to five years, what building owners, consultants and other stakeholders must keep in mind is “recovery readiness,” including best practices for reconfigured office designs and other issues related to making sure buildings are safe and viable. The more educated organizations are, the better prepared returning employees and management will be. The effects of this commercial real estate activity will vary from increased efficiency to lowered operational costs to closer monitoring of employees and

building guests. These changes will support the viability of the commercial real estate market.

In the post-pandemic economy, building owners, developers, architects and contractors and engineers will continue to face challenges regarding cost and efficiencies, with the ultimate aim of attracting and retaining star tenants to occupy their buildings. Technological innovations have emerged that offer all industry stakeholders benefits and improvements. While a number of core building system advances are providing competitive advantages for top commercial properties, leading the way to a “new better.”

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*Post-pandemic commercial real estate activity will include increased efficiency, lowered operational costs, and closer monitoring of people*

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