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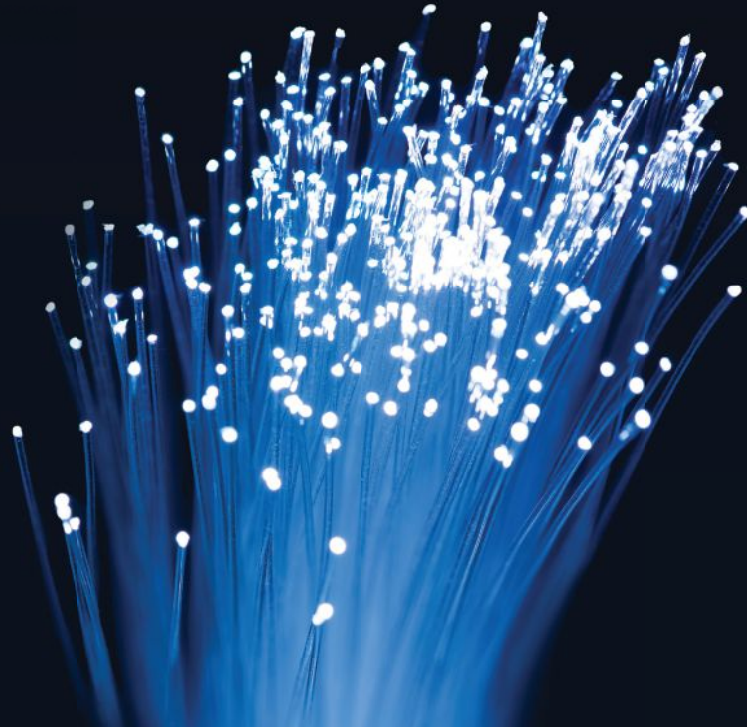
A Risk Incognito

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in preparing for

5G



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ABOUT IFMA IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in more than 100 countries. This diverse membership participates in focused component groups equipped to address their unique situations by region (136 chapters), industry (17 councils) and areas of interest (six communities). Together they manage more than 78 billion square feet of property and annually purchase more than US\$526 billion in products and services. Formed in 1980, IFMA certifies professionals in facility management, conducts research, provides educational programs and produces World Workplace, the world's largest series of facility management conferences and expositions. For more information, visit www.ifma.org.

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The online version of FMJ features extra resources like videos, podcasts, white papers and more to enhance your reading experience. Click on the FMJ Extra icons that appear in the digital magazine to link to additional sources of information to learn more about topics covered by articles in this issue.

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Check out the online issue of FMJ for a special section that follows the end of the print magazine and includes additional articles not available in the print edition. Read the extra articles listed below for contributions from councils and communities, and other supplementary content.

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FROM LAST ISSUE

The March/April 2019 issue of FMJ had a theme of Back to Basics O&M. Our most-read article was “**Self-healing Concrete Solutions**” by Gurram Gopal and Maria Perez-Coca Lopez. Find out how the next generation of concrete could lead to less maintenance costs at http://bit.ly/o219_healing.



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 IFMA's FMJ

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- ▶ 74% of organizations report credentialed employees have **higher customer satisfaction ratings***
- ▶ 62% of organizations report credentialed employees have **higher productivity rates***



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*According to the IFMA sponsored research report, "Evaluating the Value: International Facility Management Association (IFMA) Facility Management Credentials"

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The FMP turns 15

This year marks 15 years of the International Facility Management Association's Facility Management Professional, or FMP, certification. From the very first recipient — Paul Ratkovic — to the hundreds of recipients since then, the FMP has helped facility management professionals excel in their careers.

Who benefits from the FMP?

The courses cover four core knowledge domains that are defined by the IFMA global job task analysis. These are the critical subjects any FM needs to understand:

- » Operations and Maintenance
- » Project Management
- » Finance and Business
- » Leadership and Strategy

As a baseline certification, the FMP is a good launching point for:

- » FMs who want to increase their depth of knowledge
- » People transitioning into the industry from other areas
- » Students who have completed a degree or technical program
- » Built environment practitioners such as architects, designers and safety engineers who want to better understand facility management
- » Facility-related product and service providers

As certifications crop up and change throughout the industry, the FMP has a history and proven track record of improving FM knowledge and ROI for credential holders. IFMA continues to expand the reach of FM credential and training programs, and that continues with the new IFMA credential badging program launched in 2019. With digital badging, credential holders can easily display their certifications on social media platforms such as LinkedIn. Look for FMP anniversary events and announcements throughout the year.

What are the benefits of certification?

- » FMP recipients have reported a US\$6,000 salary increase within the first year of certification (according to the IFMA-sponsored research report, "Evaluating the Value: International Facility Management Association (IFMA) Facility Management Credentials")
- » No pre-requisites and no renewal costs – once earned, the FMP is a lifetime certification.
- » The FMP is an ANSI-accredited certification.
- » Earn 60 general CE hours towards LEED credential maintenance.
- » The FMP complies with the U.S. Federal Buildings Personnel Training Act (FBPTA).
- » The average five-year return on investment is 15:1 for credential holders.
- » Bulk rates are available for groups of five or more.
- » New digital badging is available for safe online recognition and verification (learn more about IFMA's digital badges at www.ifma.org/professional-development/digital-credential-badges)

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The **VALUE** of **BELONGING**

“

Belonging to IFMA is very rewarding to me because it allows me to network with other facility managers, who share many of the same issues I face. It also allows me to mentor young facility managers and students interested in becoming facility managers or enhancing their FM skills and experiences.

– Dave Riker, IFMA Member since 2005

IFMA is comprised of 24,000 facility management professionals across the globe, but some of the most significant connections members make often take place within IFMA's membership subgroups.

Chapters, Councils and Communities are groups that make it easier for you to connect with fellow members with whom you share common ground – whether that's location, industry you work in or the building type in which you practice.

In addition to our components, some of IFMA's membership benefits include:

- Knowledge Library, offering all FM content in one place
- Educational opportunities to help you meet your career goals
- Global FM conferences and tradeshow
- Job Net, an online FM Job Board only available through IFMA
- And more...

For more details regarding membership benefits, please visit www.ifma.org/your-ifma



From the **Chair**

**GRAHAM
TIER**
CFM, FMP,
MRICS

*Chair, Board of
Directors*

It has been an amazing year as IFMA Global Board Chair, and it has been my honor to serve our 24,000 members. The organization has never been in better shape, as the focused strategy and detailed execution plan for our operations have delivered the best performance in years. This was only possible with our dedicated board members and the IFMA staff who have risen to the challenge – delivering beyond expectation and providing overwhelming support.

IFMA is raising the bar globally, including the Americas, Europe and Asia Pacific. We set the standard in training, development, membership experience and events. The recent World Workplace Europe event was extremely successful – attended by more than 800 professionals – and it is now the largest FM conference in that region. This must-see event will be hosted again next March in the wonderful city of Amsterdam. I also attended World Workplace Asia in Singapore in April, which performed extremely well. These events set the scene nicely for World Workplace in Phoenix later this year. Going forward, we will continue to host three major international workplace events annually.

On another front, we celebrate World FM Day on May 15, and there will be celebratory events around the world the entire week of May 13-17. I want to thank the 25 million people working in our profession around the world for their dedication and commitment to the built environment as ambassadors in the FM profession.

This edition of FMJ focuses on managing modern risks. FM professionals impact the customer experience at so many touch points within the built environment and throughout the entire workplace. From the sense of arrival, including the visitor registration process, to the ongoing management of a facility, we have a responsibility to make employee and guest experiences as pleasurable, safe and memorable as possible.

We are responsible for developing and implementing strategies that reduce risk to operations and protect our employees or guests during their time in our facilities, so they can return home safely at the end of the day to their loved ones.

The core business relies on us to provide relevant expertise to ensure operational resilience to protect the revenue stream, attract and retain staff with exceptional workplace experiences and support all functional activities. Thank you for all you do.

In closing I would like to take the opportunity to thank the IFMA Global Board members that are rolling off at the end of June. Your support and contribution have been outstanding, and the profession is in a better place as a result of your contribution and commitment to the field.

Best Regards,

IFMA'S 2018 Operations & Maintenance Benchmarking Report



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IFMA, AFE, ASHRAE, ISSA TO COLLABORATE ON FM TRAINING FRAMEWORK

The Facility Management Training and Development Framework introduced in January by the IFMA Foundation has attracted participation from leading industry associations including the Association for Facilities Engineering (AFE), ASHRAE and ISSA (International Sanitary Supply Association). As more industry leaders add their professional development services to the framework with IFMA's world-class suite of professional credentials, the goal of establishing holistic guidelines for FM training – particularly in the technical fields – is becoming a reality.

Within the larger context of the framework, AFE will provide training, education and certifications for facility engineers; ASHRAE will offer its expertise in the category of HVAC and building energy controls; and ISSA will offer its training products for cleaning operation.

“Momentum is building as more and more organizations throw their weight behind the FM Training and Development Framework,” said IFMA Foundation Chair Nancy Johnson-Sanquist, IFMA Fellow. “These early adapters are setting the bar for the future of the FM industry and its component industries.”



IFMA signs Strategic Partnership Agreement with Macau Institute of Management

IFMA has signed a Strategic Partnership Agreement (SPA) with the Macau Institute of Management (MIM) to expand availability of facility management resources and professional training in the region.

The SPA marks the first formal user adoption of the IFMA Foundation's FM Training and Development Framework as the basis for property and facility management industry training. MIM will increase FM skills education in Macau and assist the local community in achieving IFMA credential designations, such as the foundational Facility Management Professional™ and specialized Sustainability Facility Professional® certificate programs, and the prestigious Certified Facility Manager® certification.

The strategic partnership will provide international and local dialogue and networking between the organization's professional members while developing and maintaining high standards of professional conduct. Together, IFMA and MIM will support the FM field with information and education while expanding public understanding of FM and its role in organizations.

Active shooters ranked as top organizational threat

According to “The 2018 Active Shooter Preparedness Report,” compiled by Everbridge in partnership with Security Management magazine, more than three quarters of organizations list an active shooter situation as their top safety threat, outranking concerns such as natural disasters, cyberattacks and supply chain disruptions.

When compared to Everbridge's inaugural report from 2016, the findings show a corporate environment with heightened security awareness, which has not, however, translated into tangible preparedness efforts for most organizations. Half do not have a communications plan in place, and 62 percent never run drills.

Seventy percent of organizations said that their top concern during an active shooter event is communicating and confirming the safety of impacted employees, as most active shooter situations are over in less than 10 minutes.

Eighty percent of employees prefer that it take seconds for their companies to notify them of an active shooter situation; yet when asked how long it would take to notify employees of an incident, two-thirds of companies thought that notifications would take minutes.

The report is based on surveyed responses from more than 630 security, facilities, business continuity and emergency management professionals.

Download the full report at bit.ly/2T0o3BR to gain access to seven actionable best practices

Digital badging expands to include FMP[®] and SFP[®]

After launching digital badges for Certified Facility Managers[®] and Retired



CFMs[®] in February, IFMA extended the program to professionals who have earned the Facility Management Professional[™] (FMP) and Sustainability Facility Professional[®] (SFP) designations. Offered at

no additional cost to credential holders, the graphic badges link to a web page detailing the skills and requirements it took to earn the designation, as well as the date earned and term of validity.

“It’s more important than ever for FM professionals to demonstrate their knowledge and skills to employers. Digital badging is the latest innovation to present that value, which is why IFMA is the first FM organization to offer it,” said IFMA Chief Operating Officer Don Gilpin.

IFMA has partnered with Credly, a digital badging company, to provide this service through their platform, Acclaim. Credential holders can manage badges through Acclaim to:

- » Share credentials online in a way that’s simple and can be easily verified in real time;
- » Convey underlying skills and qualifications quickly and clearly;
- » Maximize visibility and differentiation in the job market by sharing via LinkedIn, Facebook, Twitter, email or websites;
- » Gain instant, secure credential validation.

Learn more at
ifma.org/digital-credential-badges

NEXT STEPS IN IFMA CEO SEARCH

Over the past several months, the IFMA CEO Search Committee has worked behind the scenes to prepare the organization and the search process for our next CEO. Senior staff and board members have met with leaders of several top associations to review industry best practices for the search. We gathered input from all levels of staff on desired characteristics, as this position truly sets the internal organizational culture. And we’ve ensured continued operational stability, resulting in positive mid-year financial standings.

The CEO Search Committee is dedicated to recruiting the right fit to lead our world-class team and deliver the long-term strategy for the future of IFMA. We’re committed to transparency and look forward to sharing updates on the process throughout the next several months. Members include:



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UPCOMING EVENTS



World FM Day 2019
 May 15, 2019
bit.ly/worldfmday19



ISSA Show Canada
 June 11-13
 Toronto, Ontario
 Canada
canadashow.issa.com



World Workplace 2019 Conference & Expo
 Oct. 16-18
 Phoenix, Arizona
 USA
worldworkplace.ifma.org

INCREASED PHYSICAL AND DATA SECURITY THREATS WITH IOT

New research reveals that IoT automation platforms in smart buildings are presenting attackers with new opportunities for both physical and data compromise. The findings have serious implications for organizations operating inside smart buildings, as well as employees working from smart home environments.

“Cybersecurity Risks in Complex IoT Environments: Threats to Smart Homes, Buildings and Other Structures” warns that automation platforms are increasingly being used to chain multiple devices together to create user-friendly smart applications, which inadvertently creates new and unpredictable attack surfaces that can be hard to manage.

A recent Gartner report estimates that by 2021 there will be 25.1 billion internet-connected devices, growing at a rate of 32 percent per year. This report states, “Everything that can be connected to the internet will be – eventually.”

The biggest issue with automation rules is that they become increasingly complex as more devices and actions are added. They are prone to logic errors, and it becomes more challenging to manage, track and debug actions, especially if there are functional overlaps between rules.

The report outlines a variety of new threats specific to complex IoT environments, including: cloning a user’s voice to issue commands via a voice-assistant speaker; adding a phantom device to fool presence detection checks in smart locks to keep doors unlocked; and inserting logic bugs to switch off smart alarms and more.

Many IoT automation servers are exposed on the public internet. Attackers could exploit this security oversight to break into smart buildings or reprogram automation rules, steal hardcoded sensitive data including router log-ins, add new devices, infect devices with malware, and conscript devices into botnets.

Precautionary measures to help mitigate new threats presented by complex IoT environments include:

- » Enable password protection
- » Change default settings
- » Do not jailbreak devices or install applications from unverified third-part marketplaces
- » Update device firmware
- » Enable encryption in both disk storage and communication platforms
- » Make regular backups of the configuration and automation rule files of your IoT automation server

For the complete report, visit bit.ly/2UmyZLy.

Schwarzenegger Institute study finds PACE program benefits

Part of the University of Southern California’s Sol Price School of Public Policy, the Schwarzenegger Institute recently released a comprehensive study highlighting the significant positive impacts of the Property Assessed Clean Energy (PACE) program, including job creation, economic investment, energy savings and insurance savings.

The study, “Impacts of the Property Assessed Clean Energy (PACE) Program on the Economies of California and Florida,” performed a regional economic impact analysis of PACE financing by the leading PACE provider in the U.S., Ygrene Energy Fund. The findings account for only a fraction of the total PACE market but highlight the positive impacts on a range of economic, energy and environmental indicators, including energy savings.

“For facility managers, PACE may present an innovative mechanism to get funding for long-delayed building upgrades with no out-of-pocket capital requirements. Every facility manager should learn more about PACE legislation in progress or programs already available in his or her state.”


– DEAN STANBERRY, CFM, LEED AP O+M
“Keeping Pace,” May/June 2017 FMJ

The PACE program provides lower-cost, long-term financing for energy and resiliency improvements that is more accessible than other types of financing and includes built-in consumer protections. In California, over the useful life of improvements, PACE is on track to reduce electricity consumption by more than 3.6 million megawatt hours, natural gas consumption by more than 2.8 billion cubic feet and will save more than 2.3 billion gallons of water.

A copy of the study is available at
<http://schwarzeneggerinstitute.com/research>

Have relevant FM industry news to share?

Submit your news to be considered for inclusion in the Industry News section of the next issue of FMJ. Send us an email at communications@ifma.org



Raising the Value: Thomas

After a decade in retail work, Thomas made the critical decision to go trade school for HVAC maintenance. After 1,600 hours of instruction time and with his diploma in hand, Thomas now helps maintain the expansive campus of a leading Texas-based technology company. An eager learner, he takes advantage of our on-the-job training, and has quickly proven his worth as a technician and troubleshooter, earning the respect of his colleagues. He's setting an example for at home, too: Thomas's brother recently completed his own HVAC certification and just joined C&W Services' Texas team.

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A Risk Incognito

What lost knowledge is costing your organization

BY LAVERNE DECKERT

The previous “On Standards” feature (March/April 2019) focused on the subclause of ISO 41001, *Facility management — Management system — with requirements for use*, subclause 7.6, Organizational Knowledge. As a reminder, this clause is a requirement for the organization to “determine the knowledge necessary for the operation of its processes and to achieve conformity of products and services.” Given the theme of risk management, let’s consider the loss of Organizational Knowledge in the context of a modern risk to the organization.

The Cost of Knowledge Loss

Recently, I received a call from a colleague. His company had been asked to submit a proposal for a job. He knew that they had done similar work before and the processes and information needed to write the proposal should have been in the company’s project files. He was unable to find what he needed and was wondering if I had any information or resources for similar work. We discussed the likelihood that the information was on the hard drive of a retired employee. Our verdict: very likely.

The competency, skills, knowledge and expertise to do the requested work exists within this company. There is no question about that. But the time spent searching for — and not finding — information to complete an RFP, and the resulting recreation of the work, will impact the net profit of the overall project (should they win the work).

This situation is not uncommon. Just think back over your day or your week and you will probably remember spending time

searching for an email, a file, or a policy you needed. Multiply that times the frequency of your activity, then the frequency of your staff who are also doing their own searches.

Knowledge loss can be defined as a failure to retain organizational knowledge.

Knowledge waste is the failure to use organizational knowledge when it would be useful. (For this purpose, I consider knowledge loss or waste as interchangeable since unused knowledge is of no value to the organization).¹

I’m sure many would agree there is a cost to their organization when knowledge walks out the door, but for most, that cost is vague and intangible. Few organizations quantify the impact of knowledge loss to the business.

As a facility manager, you must take measures to ensure the health, safety and security of facility occupants; protect physical assets; guard against threats from weather, fire, theft, building systems failures, cyberattacks — the list goes on and on. Have you also considered how your organization might be at risk if key personnel who manage these threats were not present? If the knowledge to address the risk doesn’t exist beyond one individual’s “know-how” — and it is not documented and retrievable when it is needed — it should be considered potential lost knowledge.

You might use a risk assessment tool such as the table on the following page to determine a threat ranking index for various events. If we modify it with a fifth factor — unavailable knowledge to correct the situation — we begin to understand the impact

Knowledge loss is a legitimate modern risk and becomes increasingly relevant when considering the following:

Knowledge workers spend between

15 to 35 percent

of their time searching for information.²

40 percent

of corporate users reported that they cannot find the information they need to do their jobs on their intranets.²

U.S. businesses lose

US\$47 million

in productivity each year as a direct result of inefficient knowledge sharing. (This is the median result.)³

U.S. knowledge workers waste

5.3 hours

every week either waiting for vital information from their colleagues or working to recreate existing institutional knowledge.³

Delays due to unshared knowledge have a major impact on project schedules.

66 percent

of all such delays will last up to one week, and 12 percent will last a month or more.³

42 percent

of institutional knowledge is acquired specifically for the employee's current role and is not shared by any of their coworkers.

85 percent

The typical productivity cost of an employee leaving is of their base salary due to their replacement's mistakes, lost knowledge and lost skills.⁴

	1 Unlikely 2 Possible 3 Probable	1 Very slow 2 Gradual 3 Sudden	1 Strong 2 Average 3 Weak/none	1 Little 2 Considerable 3 Severe	1 Unlikely 2 Possible 3 Probable		
	A <i>Event probability</i>	B <i>Speed of onset</i>	C <i>Existing mitigation</i>	D <i>Severity of impact</i>	E <i>Knowledge unavailable</i>	<i>Subtotal</i> (A*B*C*D (*E))	THREAT RANKING INDEX
Water supply interruption exceeding 4 hours	1	3	3	2	2	18 * 2	36
Chemical spills	1	3	2	1	3	6 * 3	18
Power outage exceeding 4 hours	2	3	2	2	2	24 * 2	48

(ADAPTED FROM IFMA. FACILITY MANAGEMENT LEARNING SYSTEM: EMERGENCY PREPAREDNESS AND BUSINESS CONTINUITY)

of knowledge loss or waste. In the example, the index value has at least doubled. Now consider this in context. The assessment here is for an accounting department, but what if this were a hospital facility?

Consider building a knowledge management (KM) strategy around the mission-essential functions and supporting functions you've identified in your emergency preparedness plans. The APQC defines KM as a collection of systematic of approaches to help information and knowledge flow to and between the right people at the right time (in the right format at the right cost) so they can act more efficiently and effectively to create value for the organization.

Identify the key employees supporting these functions and begin to capture their knowledge. Remember, it's not enough to capture and store this knowledge. Your overarching KM goal is to get the right information to the right people at the right time so they can act. Unused knowledge is of no more use to your organization than lost knowledge.

Are we too late?

During an IFMA World Workplace networking event, a facility manager shared with me that he was planning to retire in two years

and asked me when he should begin to start his knowledge transfer program. My answer to him (and to you) was, "Yesterday. Last week. Last year." But of course, there is no time machine to capture the knowledge already out of our reach.

Instead, in your efforts to manage your risk more effectively and to have a positive impact on productivity, you should consider knowledge loss within the facility management function a significant risk to the organization and begin to implement a knowledge management strategy to ad-

When assessing any risk, an organization must always consider whether it has the knowledge at hand to address that risk should an event occur. Ask yourself these questions:

- » What knowledge is needed to address this issue?
- » Who has it?
- » Who will need it?
- » Where does it reside?
- » Should an event occur, how is it accessed?

dress this risk and to complement your overall risk management plans. **FMJ**

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The Unforeseen Benefit of the Fourth Industrial Revolution

VIA UNSPLASH / SVEN SCHEUERMEIER



“We won’t experience 100 years of progression in the 21st century — it will be more like 20,000 years of progress at today’s rate.”

— RAY KURZWEIL, THE LAW OF ACCELERATING RETURNS

In 1760, the First Industrial Revolution swept throughout Britain and the rest of the world, shifting the burden of construction and manufacturing from consumer to enterprise. Until that time, people were responsible for spinning their own cloth and crafting their own furniture. The invention of the steam engine — and its subsequent role in powering manufacturing equipment, automobiles and ships decades later — created a new standard of living for people throughout the world and reshaped nations’ economies.

More than 250 years and two more industrial revolutions later, humanity has come full circle from a revolution built on consuming water to a revolution with the potential to save it.

The height of the Fourth Industrial Revolution is nigh upon us, and not a moment too soon. A growing population, increasing global energy consumption and humanity’s exacerbation of climate change are all affecting Earth’s most precious resource: its water.

‘TIL DEATH DO WE PART

—
The World Economic Forum characterizes the Fourth Industrial Revolution¹ as “a fusion of technologies that is blurring the lines between the physical, digital and biological spheres.” In many ways it is the redistribution of knowledge through newly created delivery mechanisms that have proliferated at an exponential pace in the last few decades. For instance, the processing power of the device on which you’re reading this article was unimaginable when the first computers were invented. This is a noteworthy example of the rate at which technology is advancing in the 21st century.

In 2001, American inventor and futurist Ray Kurzweil published an essay called “The Law of Accelerating Returns,” in which he posits that technology advances at an exponential — rather than “intuitive linear” — rate. Each subsequent wave of innovation and advancement essentially piggybacks on the wave that preceded it, much like how a tsunami’s force is com-

pounded as successive waves reach shore. In fact, Kurzweil predicted, “We won’t experience 100 years of progression in the 21st century — it will be more like 20,000 years of progress at today’s rate.”

One need only look at the rapid advancements in machine learning, artificial intelligence, powerful data analytics and the Internet of Things to see the truth of his hypothesis. It is just as clear that humanity will never return to an age where the physical, digital and biological were distinctly separate. The marriage of these three worlds is now quintessential to energy production and conservation and, by extension, our species’ survival in coming generations.

SYMBIOSIS

—
Water is the key ingredient in the traditional paradigms of energy production.³ It is used to cool coal and nuclear power plants; to drill, mine and refine oil, uranium and natural gas; to transport energy sources through pipelines; to test those pipelines

40%

Of freshwater withdrawals in the U.S. come from electric power generation

65%

Of U.S. electricity comes from power generators that need cooling

150,000

Total terawatt-hours of energy consumed in 2016 globally

28%

Predicted global increase in overall energy consumption by 2040

for leaks; and to act as a method of pollution control at thermoelectric plants. According to the Union of Concerned Scientists, one kilowatt-hour of electricity requires up to 60 gallons of water at coal and nuclear plants.

In fact, according to their estimates, “electric power generation is responsible for almost 40 percent of freshwater withdrawals in the United States.” Similarly, “around 65 percent of U.S. electricity comes from power generators that need cooling.”

Under current models, the water required to produce energy — of which global consumption has increased by 70,000 terawatt-hours in less than 40 years — will soon become unsustainable. Humans consumed about 150,000 terawatt-hours of energy in 2016, the majority of which came from traditional sources like coal, crude oil and natural gas.⁴

As power becomes more and more accessible to larger portions of the global populace, and as the population increases at about 3.4 percent per year⁵, the U.S. Energy Information Administration projects that overall energy consumption on Earth will increase 28 percent by 2040.⁶

When considered in the context of growing drought made worse by humanity’s acceleration of climate change, the demand for water will increase drastically while our ability to source, supply and deliver it becomes more difficult. Enter the fourth industrial revolution.

DEMOCRATIZATION OF SUSTAINABILITY

Amidst the backdrop of increasing global resource demand and consumption and the grim reality of previous industrial revolutions’ collective effect on our planet, the Fourth Industrial Revolution has a unique place in history. It has the opportunity to save and optimize the remaining resources our planet has left to give. The companies that seize this opportunity and implement new technologies to conserve resources like energy and water are the ones that will thrive in the decades to come.

Reasons to Reduce Water Consumption

Saving water does more than just help the environment. It is also simply good business practice. Here’s how reducing consumption improves the bottom line:

RISK MITIGATION

Any savvy businessperson knows mitigating risks leads to higher profits. By eliminating chance, it is easier to reach a desired outcome. In terms of resource consumption, the risk of natural disaster, climate change, supply chain failure or geopolitical struggle could all drastically impact the availability and cost of electricity, gas and water. By minimizing demand, an organization inherently mitigates its exposure to these risks.

“TRICKLE UP” SUSTAINABILITY

It can be easy to forget the interconnectedness of electricity, gas and water. Water treatment and delivery has massive energy demand. Gas extraction and refinement requires large amounts of water. End users, by reducing their personal consumption, also reduce the overall footprint by a factor much larger than what’s shown on a monthly bill. Those savings, in turn, trickle all the way up the supply chain to help preserve resources yet to be extracted.

COST SAVINGS

Arguably the simplest reason to reduce resource demand is that it saves money. By employing the most efficient means to operating a business, owners and operators will cut costs dramatically. Although implementing systems for demand reduction can, at times, involve large upfront investments, IoT tools can provide tangible return on investment feedback to ensure the investment is recouped, and the utility bills fall. For commercial realty owners, that feedback powerfully effects NOI and property value.

To that effect, the World Economic Forum writes⁷, “Companies, international organizations and governments still need to establish how they can work together to improve their water management.” This is true across every single industry, whether a business is B2C or B2B, whether they’re headquartered in New York or Nairobi. Never before has a wave of innovation created such a ubiquitous and lucrative opportunity for humanity to save the very thing that keeps us alive.

The opportunities this revolution provides are not just limited to corporations. In the age of globalization, consumers have a louder collective voice than at any point in the past. It’s time to use it to support businesses that use technology to create a socially responsible enterprise and to shun those that continue to pollute our planet unnecessarily and consume its resources unabated. Sustainability, as we’ve seen, can be accomplished with our wallets as well as our brains.

Humanity is at a unique crossroads in its history. Until now, widespread innovation traditionally came at the cost of Earth’s resources. Now, finally, 250 years later, it can be used to save them. FMJ

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GLOBAL HARMONIZATION

HOW GHS IS UNIFYING HAZMAT PROCEDURES

BY BILL CONLEY

World peace! Game show contestants say they want it, school children pray for it, philosophers and world leaders aspire to it, but there's a long way to go before it's achieved. Getting people to work together toward a common goal is a worldwide challenge. However, in the world of FM there is now one unifying program that will help countries work together to reduce risk in facilities. It was adopted by the United Nations in 2003, and it espouses the goal of global harmonization. As coincidence would have it, the program has been named the Globally Harmonized System (of Classification and Labeling of Chemicals), or GHS.

GHS was implemented as an initiative to bring the chemical regulations and standards of different countries into one common classification. It is an internationally adopted system for the classification and labeling of hazardous chemicals that includes established criteria for sorting hazards and for categorizing them according to their relative risks.

The system defines and classifies the hazards of chemical products and communicates health and safety information on labels and safety data sheets. The goal is that the same set of rules for classifying hazards, and the same format and content for labels and safety data sheets (SDS), will be adopted and used around the world. The GHS was developed to identify both the hazards and the risks associated with chemicals, and it provides established language and symbols for each hazard class and each category within a class.

An international team of hazard communication experts initially developed the GHS. The program includes criteria for the classification of health, physical and environmental hazards. It also specifies what information should be included on hazardous chemical labels as well as safety data sheets. The United States was an active participant in the development of the GHS and is one of the United Nations members that has been established to maintain and coordinate the implementation of the system. The United States Environmental Protection Agency

(EPA), the Occupational Safety and Health Administration (OSHA) and the U.S. Department of Transportation (DOT) have all adopted the GHS for use in the United States. The full, official text of the GHS can be found on the United Nations web page.

For facility management professionals, the health and safety of all personnel in and around the facility is of paramount importance. There are several areas in which FM professionals should concentrate. The first would be hazard identification. A hazardous materials survey or assessment identifies the presence of any dangerous chemicals in a facility. The survey is performed in order to identify all materials that could be harmful if they are not handled correctly.

A job hazard analysis (JHA) should also be performed. It focuses on how tasks are performed so the danger of exposure or spills can be mitigated. Also perform a risk assessment that determines the probability of a hazard causing injury or harm.

The information from these assessments allow FMs to approach a hazardous material, or HazMat, policy on multiple fronts. Information can be used to develop the processes needed to handle, use and dispose of hazardous products, and FMs are then able to train personnel on HazMat processes. They can also document all HazMat processes for future reference. Of course, the GHS provides tools to guide and improve processes based on the accumulated expertise of the profes-

GHS HAZARD SYMBOLS



Explosive

Explosives; self-reactive substances; organic peroxides



Flammable

Flammable gases, aerosols, liquids, and solids; pyrophoric liquids or solids, self-heating substances, self-reactive substances, substances that emit a flammable gas upon contact with water, organic peroxides



Oxidizer

Oxidizing gases, liquids, and solids



Compressed gas

Gases under pressure



Irritant

Irritant (skin and eye); skin sensitizer; acute toxins; narcotic effects; respiratory tract irritants; hazardous to ozone layer (non-mandatory)



Toxic substance

Acutely toxic substances that may be fatal or toxic if inhaled, ingested, or absorbed through the skin



Corrosive

Skin corrosion/burns; eye damage; corrosive to metals



Environmental hazard

Non-mandatory; acute aquatic toxins; chronic aquatic toxins



Health hazard

Respiratory sensitizers; carcinogens; mutagens; reproductive toxins; target organ toxins, single exposure or repeated exposure; aspiration toxins

sionals who devise the program.

Specific GHS language has been adopted to provide notification of hazardous materials. GHS includes a signal word such as “danger” or “warning” when defining the chemical. A symbol, or pictogram, is also provided. For example, a flame within a red-bordered diamond. A hazard statement (such as “causes serious eye damage”) will be added along with precautionary statements for safely using the chemical.

A critical part of this hazard classification system is the set of criteria that describes a given class of hazard (for example, flammable liquids) and the ratings (or categories) of the hazards within each hazard class.

The hazard categories are numbered from one to five. The lower the number, the greater the severity of the hazard. So, category one hazards are the most dangerous. It is important to note that this GHS numbering system is the opposite of the NFPA rating system. Under the NFPA system, the most dangerous rating is four, while zero would pose a minimal hazard.

Some authorities may also require noti-

fications for mixtures that contain hazardous ingredients in certain concentrations.

TYPECAST

How are hazardous materials or goods defined? Hazardous goods are solids, liquids or gases that can harm people, other living organisms, property or the environment. There are nine categories that are taken into consideration:

- Explosives
- Gasses
- Flammable Liquids
- Flammable Solids
- Oxidizing Substances and Organic Peroxides
- Toxic Substances and Infectious Substances
- Radioactive Materials
- Corrosive Substances
- Miscellaneous Dangerous Goods

Classifications require that manufacturers and importers evaluate and classify the chemicals for which they are responsible. This process identifies the relevant data regarding the hazards of a chemical and defines the hazards associated with the chemical. Manufacturers must decide whether the chemical will be classified as hazardous according to the definition of a hazardous chemical and then include the determination of the degree of hazard.

TRAINING

In order to comply with the universal adoption of this program, epitomized by OSHA’s revised Hazard Communication Standard (HCS) in the United States, companies are required to train employees on the significant changes associated with the implementation of the GHS.

The central issue in training about HazMat on the premises is the shift from focusing on the “Right to Know” precepts of the past to a more comprehensive “Right to Understand” for all employees. Employees must be informed about the presence of any hazardous chemicals in their work area(s). They must also be given the location of the chemicals and access to a written hazard communication program, including the list of hazardous chemicals located in the facility and the corresponding Safety Data Sheets (SDS).

Additionally, GHS training requirements need to cover an understanding of the methods used to detect the presence or release of hazardous chemicals in the employees’ work area. For example, the physical appearance

or odor of the chemicals. Personnel must become familiar with the physical and health hazards of the chemicals in their work area, including everything from simple asphyxiation to combustible dust, to pyrophoric gases, and any other hazards not otherwise classified. Employees must know what safety measures and precautions they can take to protect themselves from hazards, including those implemented by the company. This includes knowledge of emergency procedures and the use of required personal protective equipment (PPE).

SAFETY DATA SHEETS (SDS)

Most facility managers have dealt with MSDS documentation on chemicals in the workplace. Binders are maintained in designated locations for reference, the sheets must be up to date, and a system must be in place to ensure all HazMat in the facility is accounted. This process has served employees well in the past, but the GHS program has refined the presentation of materials. The adoption of SDS is an essential component of the GHS. It is intended to provide comprehensive information about a substance or mixture for use in workplace chemical management.

In the GHS, the SDS serves the same function that the Material Safety Data Sheet or MSDS does in OSHA’s HazCom Standard. The introduction of the SDS format, with its uniformity and consistency, makes it even easier to track and mitigate any negative effects of HazMat. The universal acceptance of this format has increased safety in the workplace.

The SDS is normally product related and not specific to any particular workplace. An SDS should be produced for substances and mixtures which meet the harmonized criteria for physical, health, or environmental hazards under the GHS. Specifications include all mixtures which contain ingredients that meet the criteria for carcinogenic, toxic to reproduction, or specific target organ toxicity in concentrations exceeding the cut-off limits for SDS specified by the criteria for mixtures.

The information on an SDS enables the employer to develop an active program of worker protection measures, including training specific to the workplace. It provides measures necessary to protect the environment. It also provides an important source of information for other target audiences in the GHS — so certain protections can be utilized in the transport of dangerous goods. Data for emergency responders (including poison centers) and for profes-

Four types of hazards are recognized in the GHS:

PHYSICAL HAZARDS

Define the danger related to the chemicals’ physical properties, specifically if it is explosive, flammable or capable of oxidation.

HEALTH CONSIDERATIONS

Whereby exposure to the chemical will cause detrimental effects to the health of personnel.

ENVIRONMENTAL HAZARD

Will cause harm to the air, water or the ground.

HAZARDS NOT OTHERWISE CLASSIFIED (HNOC)

Chemicals that may not have the characteristics that meet GHS classification criteria, yet are still deemed dangerous.

SDS Format

The most important distinction between MSDS and SDS is how information in the document is presented. In the MSDS format, there was no rhyme or reason as to how the sheets were organized. Reviewing them for pertinent information, especially in an emergency, could be time-consuming and confusing. The SDS represents a uniformity in data reporting using the following 16 headings. Each page is the same, no matter the manufacturer or the country of origin.

These first three sections provide the most basic and important information. They identify what the material is, what hazard it poses and what ingredients it includes.

- 1 – Identification
- 2 – Hazard(s) identification
- 3 – Composition/data on ingredients

Sections four through eight tell workers how to deal with the material. This advice starts with the most urgent concerns and works down to day-to-day safety.

- 4 – First-aid measures
- 5 – Fire-fighting measures
- 6 – Accidental release measures
- 7 – Handling and storage
- 8 – Exposure controls/PPE

Sections nine to 11 go into detail about the nature of the material itself and where its hazards are derived.

- 9 – Physical and chemical properties
- 10 – Stability and reactivity
- 11 – Toxicological information

Sections 12-15 cover concerns that are not part of OSHA's jurisdiction. These sections are still required as part of the standard SDS format. Environmental concerns and transportation requirements are included here.

- 12 – Ecological information
- 13 – Disposal considerations
- 14 – Transport information
- 15 – Regulatory information


Section 16 is a catch-all for any other relevant details that might not fit elsewhere such as the date the document was prepared.

- 16 – Other Information

sionals involved in the use of pesticides and any consumers thereby affected are also included.

HARMONIZATION

The GHS is an international attempt to bring into agreement the chemical regulation and standards of different countries. It is meant to be a logical, comprehensive and universal approach to defining the health, physical and environmental hazards of chemicals. It is designed to provide safeguards and minimize the threats and dangers represented through chemical use. It has created a classification process that reports all available data on chemicals for comparison with defined hazard criteria. This communicates hazard information in a prescribed and uniform way through appropriate labeling and the consistent format of safety data sheets. The program provides a set of guidelines to help ensure the safe production, transport, handling, use and disposal of hazardous materials. And it is a set of recommendations, or a collection of best practices, that can be used to the benefit of all citizens in the workplace, no matter their industry or location.

It's not world peace. But, hey, countries are working together to safeguard the health and welfare of workers while taking care of the environment. So, global harmonization sounds like a step in the right direction. 



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A large crowd of people is shown in a blurred background, suggesting a busy public event or festival. In the foreground, a person is wearing a highly detailed and realistic wolf costume. The costume features grey and white fur, large expressive yellow eyes, and a long, dark snout. The person in the costume is wearing a blue and white striped long-sleeved shirt and blue jeans. The overall scene is brightly lit, likely outdoors during the day.

STOPPING THE BIG BAD WOLF

Developing a holistic visitor security system

We live in fearful times: terrorist threats, cyber-attacks, Trojan horses, earthquakes, floods and the unpredictable nature of society in general. It can all be overwhelming. Technology provides a seemingly endless stream of information that can easily evoke a knee-jerk reaction in even the most level-headed facility manager when deciding how to keep an organization's premises, staff and data safe.

On top of having to guard against these security threats, regulatory bodies have set compliance measures that industries must adhere to. This includes protecting users who may blindly entrust companies with their private data. According to a USA Today article, ineffective data security practices have led to billions of users' confidential information being breached by malicious hackers in 2018 alone.¹

Are we allowing a proverbial wolf in sheep's clothing into our facilities because of disjointed and aging security tools and processes — especially when it comes to visitor management? Building a moat around every campus, using typewriters and enlisting the services of armed stagecoaches to communicate with the outside world isn't an option. But neither is implementing overly invasive security measures that dictate every inch of operations. Yet, not providing secure data management allows any wolf to roam freely in an organization.

Effective visitor management solutions have lagged the digitization of so many other business areas. For years the paper logbook was synonymous with security at reception desks. Yet, it functioned as the sole record of everyone who is or had been on a facility's premises. That is, if the visitor entered their true details, or whether they bothered to do so at all.

When there was a need for businesses to know and track who gained access to their premises, cloud-based visitor management systems (VMS) stepped onto the scene. VMS was introduced into lobbies and reception areas in the form of self-check-in kiosks and iPads. Its initial purpose quickly grew beyond just automating visitor

management tasks. It offered consolidated records of visitor information that were instantly accessible from a central platform.

The category leveraged rapid technological advancement to provide complex, scalable solutions to a variety of industries. Regular feature roll-outs were developed to meet evolving business needs, and cloud-based systems offered quick deployment to meet urgent business needs.

For the most part, strategic system features evolved from the needs of early adopters of the technology. Before long, a need for greater security and integration with a business's existing software saw an almost exponential increase of VMS service providers and functionality.

With this growth, a number of next-gen features were introduced to help companies sustain business continuity, increase their emergency preparedness and to meet complex regulatory compliance requirements more easily.

Prior to these next-gen solutions, weaknesses in existing visitor processes had been exposed. Vast stores of confidential visitor information had been captured, and that gave rise to serious questions on what security to expect from VMS providers entrusted with storing this valuable data.

To understand how next-gen features provide solutions to stop a wolf in its tracks before it can enter facilities or breach data vaults, it's best to take a step back and look at how current features paved the way for these enhancements.

• • •

The digitization of visitor management does not start and end with a basic record of visi-

tor's data. To know and understand how visitors interact with facilities and mitigate the associated risk, companies require the self-check-in process to be highly customizable. A VMS offers the functionality to have guests supply information relevant to their visit. To satisfy the requirements for various types of visitors, they are presented with customized forms that intuitively guide them through relevant sets of questions.

The requirements for contractors or vendors can be vastly different than for a person coming for a job interview. Custom protocols can include signing NDAs, waivers and other legal documentation as well as watching security videos that highlight evacuation procedures. Self-check-in offers to ease the complexity associated with assigning visitor protocols by consolidating distinct user experiences onto a single platform.

Perhaps one of the most innovative solutions a VMS offers is its ability to integrate with an arsenal of global business systems already present in the cloud-based ecosystem. It is possible to store all forms mapped with custom fields, working alongside e-signature software, onto existing cloud servers. Internal messaging platforms are used to send any number of hosts instant notification of their guest's arrival. All this information converges on an online platform allowing for real-time visibility and reporting capabilities.

Previously captured fields are bypassed at future sign-ins as guest preferences are recorded and remembered. Visitors are guided through the sign-in process much more quickly and accurately, and this frees up employees who were usually assigned these administrative duties. Administrators can instantly download detailed visitor records which greatly improves companies' ability to be audit-ready.

From a business continuity standpoint, companies are able to properly address their emergency preparedness. Security officers have a real-time view of guests on the premises from a digital address book. They are able to send instant notifications during evacuation procedures. The enhanced capacity to remotely guide guests in an emergency situation reduces the chance of liability and the reputational harm that comes from having visitors fall through the cracks.

The VMS offers a consolidated view where all administrative tasks across all locations are hosted and launched. For large

organizations with multiple departments maintaining multiple entry points at multiple locations, it is essential for administrators to have the ability to sign user permission roles over to relevant stakeholders or local hosts. These hosts are able to customize visitor sign-in flows for the facilities they manage.

The ability to instantly alter any sign-in permission is only of consequence if administrators can deploy these standardized protocols to several locations at once, unhindered by their geographical location. The ubiquitous character of a cloud-based VMS offers this functionality.

Businesses now have the capacity to capture and analyze endless amounts of visitor data. It helps detect patterns and evaluate tendencies across an organization. It also contributes to streamlining security processes and further refinement of visitor protocols.

Few organizations have been able to verify the authenticity of a person's identity and integrate it with their VMS. When it comes to industries that have to adhere to demanding regulatory compliance, this becomes a major problem.

• • •
Not all businesses require enterprise-level vetting of guests, but all businesses want to show they've taken every precaution to ensure that guests' safety is maintained at every point of contact for any eventuality.

Most industries have to meet the standards of a secure environment for both physical and data assets whether they are complying to the International Traffic in Arms Regulations (ITAR), the Food Safety Modernization Act (FSMA), the Customs-Trade Partnership Against Terrorism (C-TPAT or Europe's General Data Protection Regulation (GDPR).

GDPR is applicable to any business offering goods or services to European users, regardless of their geographical location. This regulation outlines clear directives on the type of confidential information companies can request, where and how the data must be stored along with time constraints on its retention.

By being able to customize forms for various classes of visitors, companies can only request specific information necessary to satisfy regulations for both facility and data compliance. The two crucial processes businesses should implement within their VMS to meet regulatory demands are verifying and authenticating government-issued IDs and running identities against third-party and custom watchlists.

This "hard" control, known as assisted check-in, equips security personnel with

high-volume, airport-grade scanners to confirm visitors are who they say they are and pose no threat to business operations. The system can work independently or integrate with a "soft" control self-check-in module that works effectively at high-traffic access points like parking gates or busy lobbies.

Screening government-issued IDs against comprehensive third-party watchlists from sanctioning bodies and law enforcement agencies plays a pivotal role in being proactive against possible threats. Security personnel would receive immediate notifications to respond with due diligence should a watchlist be triggered.

Integrating the assisted check-in process with a VMS means companies are not only storing validated personal information to each guest's profile but they are able to provide regulatory bodies with comprehensive compliance reports.

Airport-grade security is available to any class, size or type of business. It's a decisive method to prevent unwanted individuals from setting foot on business premises. Knowing that all this valuable data is safe and always accessible on the VMS's off-site cloud servers defines what enterprise data security is all about.

• • •
It's not just being able to catch the wolf beyond the lobby which has been a major leap in visitor management. The technology drastically raises the level of data security offered to companies using a VMS and anyone that entrusts those organizations with their information. Data security is not just about secure and reliable data hosting, but also adhering to legislation like the GDPR.

In choosing a service that will migrate and host a company's confidential data, there are no shortcuts. A vendor should be able to demonstrate it employs multiple layers of firewall security for its hosting platform and infrastructure along with a proven track record in adhering to industry compliance regulations.

Looking for service providers that have proof of Service Organisation Control (SOC) indicates the organization adheres to rigorous data security and service controls. Most importantly, it affirms a company's dedication to outstanding governance and customer relations. The presence of a full-time data protection officer (DPO) and DevOps ensures that there are regular outside third-party compliance tests while enforcing the highest possible standard of data governance.

It's become non-negotiable to be offered

local hosting in data centers around the globe. Local data residency is central to the GDPR's conditions of doing business with European customers. There have also been notable positive knock-on effects from customers knowing that their personal information will be kept for a set amount of time or removed at their behest. It builds trust in a company's brand and provides much-needed transparency at a time when unethical data handling has become commonplace.

• • •
The careful and calculated initiative taken in implementing a visitor management system for an organization's physical infrastructure should be matched by the SaaS VMS provider's data hosting integrity and the security standards.

The VMS category has made massive strides to better connect hosts and their visitors. Companies understand who accesses their facilities and mitigate associated risks by designing custom visitor experiences. This doesn't only mean complying with complex regulations but facilitating interactions that are safe and seamless.

What makes the VMS field so valuable is unprecedented growth? There are constant developments that offer solutions to unexplored concerns. Platform builders are focused on the future. They're looking at integrations outside the lobby and deeper into how facility assets are managed. IoT interactivity will rise steadily with the emergence of 5G networks that offer increased levels of connectivity and security. Users will have more freedom in how they tailor specific user experiences.

The success of this innovation relies on users contributing their expertise and experience, so providers can continue building solutions that exceed the market's developing needs. After all, facility managers want a cowering wolf and a secure, fully integrated guest experience. **FMJ**

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Bernard de Vaal is a recent journalism graduate from St. Clair College. He's written feature stories on cryptocurrency and the effect of harm-reduction strategies on mothers addicted to Opioids. He hosts a fake news awareness podcast, is a professional videographer, and writes for Traction Guest.



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Anticipatory Architecture:
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USING

ANTICIPATORY

DESIGN

TO

FACE

RISK

AND

UNCERTAINTY

BY ARNOLD CRAIG LEVIN

An organizations' second greatest cost is real estate, yet most decisions on the design of the workplace are based on limited understanding of the changes resulting from unplanned or unforeseen disruptions to the business model. Risk is managed through developing design strategies that accommodate the least common denominator. Design should deal with any unforeseen changes through a neutral approach to the workplace. At the same time, organizations are facing the need to develop workplace design strategies that are more relevant to hiring and retaining their critical workforce. In the business environment, competition for talent is fierce and migrates across industries. Anticipatory design offers strategies for how to approach the development of a workplace that addresses these needs. Design solutions help organizations anticipate the "unknown unknowns" of the future while at the same time manage risk.

The uncertainty of today's business environment is calling on organizations to anticipate and forecast their future. This forecasting helps ward off disruptive changes to business models. Organizations have historically operated in a business model where the competition was known, and the development and deployment of business strategies were based on what was known and foreseen. Even unforeseen competition was viewed through the lens of what forecasted trends could anticipate.

This mindset allowed organizations to lose competitive ground — not to organizations they deemed as their natural competitor but to organizations that appeared to come from nowhere to "disrupt" their markets and industry. In just one example, Sony, the inventor of the Walkman, based their future view on the music industry through cassette tapes and then compact discs, migrating from the Walkman to the Discman. Along came Apple, an unknown in the world of music, whose perceptual industry was computers and technology. Ap-

“ THERE ARE KNOWN UNKNOWNNS. THERE ARE UNKNOWN UNKNOWNNS.

BUT THERE ARE ALSO UNKNOWN KNOWNNS ... THAT IS TO SAY,

THINGS THAT YOU THINK YOU KNOW THAT IT TURNS OUT YOU DID NOT. ”

– Donald Rumsfeld, Former United States Secretary of Defense

ple introduced the iPod, followed by the iPhone, which resulted in a total upheaval to the music industry.

Apple became the dominant force in that industry, and Sony gave up ownership of a market they previously dominated in based on past products and innovations. Like many organizations they anticipated the future through the lens of what they knew and the trends they thought they knew. Facility managers can also fall into this trap, especially when it comes to technology.

Technology has been the prime driver of change and disruption across industries. More importantly, it has been the primary driver of disruptive change. It has allowed previously unknown organizations to enter industries and take over market dominance.

Ford, a dominant player in the design and manufacturing of automobiles, has been completely disrupted by Google — even though that may not seem obvious to a casual observer. Google is developing autonomous vehicles at the same time Ford has re-directed their business model from solely a car manufacturing company to an organization focused on urban mobility. Companies that once seemed completely separate now find themselves overlapping and competing due to technological advances.

This transformation speaks to the other critical disruptive factor facing organizations: the shared economy. Along with changes to business models that technology creates, technology has also fueled a comfort with creating fluidity. Boundaries are being blurred between traditional entities, such as taxi service and ride share services. Or even things like finding dog walkers and booking rooms at hotels and people's homes.

The conundrum can be viewed though a quote by former United States Secretary of Defense Donald Rumsfeld, “There are known unknowns. There are unknown unknowns. But there are also unknown knowns...that is to say, things that you think

you know that it turns out you did not.”

This addresses the failure of developing fluid workplace design strategies over the past two decades. We have viewed the future of work or the workplace through the lens of predicated trends. Offices shifted to open plan spaces, and open plans shifted to cubicles and benching, then came a shift back to some private offices for introverts.

These trends no more predict the future than an early quote attributed to Henry Ford who said if someone asks a horse owner what they needed, the owner would say faster horses. That answer demonstrates the blind spot most users have when it comes to technological disruptions. It is ironic that the organization founded by Henry Ford was blindsided by the same myopic perspective of how to anticipate the future.

Developing workplace designers and strategists need to stop looking at the future through this same myopic lens of trends and known unknowns. The process of developing a workplace design strategy plays a key role within the organization to assist in anticipating the future.

Analyzing unknowns could disrupt an enterprise's business model. However, the way the organization views and designs its

workplace can create a more realistic way of looking at the future. Anticipatory design strategies start by asking the question: What would happen to my organization if Google, or some other new-tech contender, enters our market?

If we're Ford, we'd ask, what would happen if Google entered the automobile business? We know the answer to that question through the lessons at Ford. But what would happen if Google entered the world of healthcare? We now have the collaboration between Amazon, Goldman Sachs and Berkshire Hathaway to provide delivery of healthcare services, along with Alphabet's CityLab engaged in urban design with their Toronto waterfront project which will create a smart city. Alphabet is Google's parent company.

Developing “anticipatory workplace design strategies” is dependent on several avenues converging to change how we look at the future.

In an example of scenario planning, Royal Dutch Shell examines multiple forces (political, social and economic) that could disrupt and derail conventional wisdom on the delivery of energy. They create multiple scenarios as the basis for developing strategies.



“Scenarios give us lenses that help us see future prospects more clearly, make richer judgments and be more sensitive to uncertainties,” says Jeremy Benham, Head of Scenarios, Strategy and Business Development, Royal Dutch Shell.

Peter Voser, Chief Executive Officer of Royal Dutch Shell, has also given interviews stating scenario planning helps the company make crucial business decisions during uncertain times in the market.

Ultimately, recognize the only strategy approach that will meet the challenges of the future’s knowns and unknowns is one based on flexibility and agility. This has to be both organizationally and architecturally.

We talk about agile workplace design strategies, but the organizations that inhabit these workplaces need to be designed as agile enterprises. Two new paradigms will inform our approach to workplace design strategies.

A new organizational paradigm should be based on a strategic vision that looks at the business intent and future state, not just on current predictions. Adopt agile business models with decentralized authorities, and make use of evolving partnerships across industries, including higher education where universities are partnering with the private sector to create Innovation Corridors.

A new workplace typological paradigm should be based on connected communities and shaped by the shared economy (co-working). Adopt a “maker space culture” along with curated precincts that merge work, life style, hospitality and learning. Create fluid boundaries between departments and agile and flexible work spaces that can be permeable and changeable in response to unknown disruptions.

Anticipatory design strategies embrace the notion that change happens both organizationally and industry wide. The workplace needs to be at the center of what informs these strategies because the things we never imagined could become the new norm. **FMJ**

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Arnold Craig Levin assesses business design and examines how design solutions can be a true catalyst for organizational

transformation. With over 45 years of experience working across client industries in the U.S., Europe and Asia, Arnold has blurred the boundaries between traditional markets of workplace by connecting design strategies to business models. His combined experience in research, teaching, consultation and design has helped organizations solve the right problem. He is a Director of Strategy at Gensler, an international architectural firm and is a member of IFMA’s Workplace Evolutionaries (WE) Leadership Team.

OUR APPROACH TO DEVELOPING FUTURE PROOFED WORKPLACE DESIGN STRATEGIES SHOULD INCLUDE:

Stop looking solely at trends to view the future. We should be asking the question “what would happen if...?”

If we look at any trends, they should be based on data and information. Specifically, look for shifts in the types of work being performed and the attributes of that work. This gives clues to who the future employee might be.

This data-based research requires going beyond the jargon of Millennials and Generation X or Z. Look at research to find the employee traits that will be needed to work in a new world impacted by constant disruption. In a report by PricewaterhouseCoopers (PwC), they found the most important traits of the future employee will be adaptability and problem solving.¹

We need to look at the types of organizational design paradigms that will be evolving to best understand the future needs of organizations and how they will be designed as business entities. In most cases these revolve around agility and flexibility. Again, from PwC:

“One clear lesson arises from our analysis: adaptability – in organizations, individuals and society – is essential navigating the changes ahead.”

Use scenario planning as the basis of developing, selecting and evaluating potential workplace design strategies. This is a process based on asking, “What if?” Royal Dutch Shell has been the forerunner of using scenario planning in modeling their strategic responses. This is due to the ever-changing energy environment.

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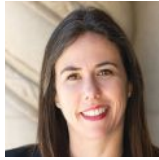
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Behind the Brand

IFMA's FMJ CSP Interview



Natalie Nottage

Executive Vice President and General Manager, Commercial Operations and Maintenance
AECOM

Natalie Nottage is a chemical engineer by background and found her way to FM more than 22 years ago. Her experience includes time in the technical services industry, including roles in engineering, facilities management, corporate strategy, enterprise risk management, business development and operations management positions.

Today, Natalie is the AECOM Executive Vice President and General Manager overseeing Commercial Operations and Maintenance, delivering approximately US\$1 billion in annual revenue through provision of facility management, maintenance and technical services to clients across the industrial, chemical and oil and gas market sectors.

FMJ asked Natalie to speak about her experiences in FM and to shed light on what she tells up-and-coming professionals in the field.

Natalie is a recipient of the AECOM CEO Award 2018 for business performance, growth, collaboration and leadership development. The award formally recognizes long-term successes and exceptional achievements that have advanced the company's strategy in profound and dramatic ways.

She has also been nominated as a finalist for the Corporate Large-Market Sector category for the Women in Technology (WIT) 20th annual Leadership Awards. This award identifies, recognizes and celebrates women working in the greater Washington, DC region who have exemplified unique vision, leadership and profound success in the technology industry. A citizen of the world, Natalie has lived and worked in global locations, including Australia, Japan, UK and the United States. She is passionate about developing others and is an active mentor to others in the industry. Her volunteering activity includes work with military veterans, homeless children, and foreign exchange students.



Always be open to trying new things, and never limit your options. While it's great to have a career plan mapped out, make sure your plan is flexible enough to allow you to take advantage of unexpected opportunities that may come at you from left field.

FMJ You were originally trained as a chemical engineer. How did you make the transition from engineering to commercial operations and maintenance?

NN Like many engineers, I've always had a passion for problem solving and finding ways to make things work better. While working as an engineer, I always made an effort to be aware of what else was going on around me in the broader business, I and took a proactive approach to offering my support to other parts of the organization. This gave me exposure to a wide range new experiences and new opportunities, and it enabled me to build trust and respect within different arenas. My career diversified from there.

FMJ How has the FM industry helped you combine your engineering and business skills?

NN FM represents the perfect intersection of engineering and business skills. From an engineering perspective, I am dealing with a physical facility that has foundations, walls, pump, pipes, electrical control systems, advanced automation and technology and all kinds of working parts that need to be functioning together in order to meet operational needs. From a business perspective, I am delivering a service that directly impacts an organization's ability to meet its goals. Whether it's a manufacturing facility, a research laboratory, a data center, or a corporate office building, every activity and interaction that takes place within the facility has a direct business impact to the users. Understanding that impact is critical to figuring out how to most efficiently and cost effectively deliver the service to meet those unique business needs.

FMJ What led you to developing your career with AECOM?

NN AECOM is one of the most diverse companies in the world. When I first joined the company almost 20 years ago, I joined because they offered me a good job in my chosen career path in my home country of Australia, where I was living at the time. To be honest, at that time I did not dream that all these years later I would still be working for the same company in a completely different career, in a completely different part of the world. But after I joined, I quickly realized how diverse the organization was, and that I could continue to challenge myself in new ways by taking on new and diverse opportunities within the company.

During my time at AECOM I have worked as a chemical engineer, a business risk analyst, a project manager, a business manager, a corporate strategy specialist, an enterprise risk manager, a global client relationship leader, and most recently, as an operations executive. The industries I have worked in include manufacturing, chemical, pharmaceutical, mining, oil and gas, consumer products, local and national governments, to name a few. I have worked across all continents of the world. I continue to have opportunities to grow and stretch myself, and this is why I chose to pursue this journey at AECOM.

FMJ What is something about you that people may not know, and how does that impact who you are as a person and a leader?

NN Early on in my career I spent two years working in Tokyo as an engineer for a Japanese technology company. I was the only non-Japanese person in my entire business unit, and I was required to conduct all of my work in Japanese language and in accordance with Japanese work customs. It was a challenging time while I adjusted to an environment where I was different to everyone else. While I do speak Japanese, I was by no means a native speaker, and at times I found that others would overlook or dismiss what I had to say because of my communication challenges.

As a leader, this experience has shaped how I interact with people who are different, have accents, or are communicating in their non-native language. I am more conscious of the tendency to overlook someone who can't communicate as easily. I make a concerted effort to listen to all voices in the room, even if this means slowing down the pace a little to allow expression of ideas. The best ideas don't necessarily come from the loudest or strongest communicators.

FMJ What advice do you give students and young professionals in the field?

NN Always be open to trying new things, and never limit your options. While it's great to have a career plan mapped out, make sure your plan is flexible enough to allow you to take advantage of unexpected opportunities that may come at you from left field. As a young woman studying engineering back in Australia, I never could have dreamed of, let alone planned for, some of the work roles I have taken on.

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Case Study: How to Manage Thousands of Annual Visitors

AstraZeneca (Gaithersburg, Maryland, USA) — Imagine managing a facility that receives thousands of visitors per year, often international, and in an environment where corporate security is paramount. Picture a business partner delegation arriving from overseas, perhaps a dozen visitors, and every individual needs to be screened and registered by the security desk. Once registered, each person must be given a visitor sticker.

This face-to-face process could last 15 to 20 minutes or more for the group. It crowds the lobby and perhaps makes guests late for their visit. Valuable collaboration time is lost, as well as the opportunity to make a great first impression.

This scenario depicts one of several challenges the site operations team sought to eliminate at the Gaithersburg, Maryland campus of AstraZeneca, a global, science-led biopharmaceutical company. The site operations team is continually focused on the employee experience, and it aims to improve the environment and the tools to support innovative science at the biopharmaceutical company.

To understand the team's challenges, it's

important to look at the nature of the industry it operates in. The science of biopharma, and the biologics research and development conducted at the Gaithersburg location, includes a great deal of external collaboration. Each year thousands of visitors arrive at the facility, and the site operations team needed a solution to streamline the visitor process. As they considered upgrades in visitor management and security, the site operations team's goal was to elevate the guest experience to match the overall expectations of the site.

Achieving that goal required improvements in visitor management from three perspectives: site operations/security, employee (host), and guest.

As described below, visitor management at the facility evolved over time, particularly in response to business growth and opportunities presented by advances in technology and site transformation.

Ad-hoc registration

A decade ago, a host would register a guest through an email to security. The host might dash off a message that said, "Hey, this person is coming for a meeting, please notify me when they arrive." Almost any system can handle one or two visitor requests like this fairly well.

It's when the groups arrive that the system's weakness is revealed. Steady growth at the company's Gaithersburg site has led to a similar increase in the number of visitors, both individuals and groups. The Gaithersburg Campus consists of nine facilities and hosts many biotech and other events throughout the year. Just over 22,000 guests visited the Gaithersburg Campus in 2018. The email stream to the security staff would've become a flood, backing up the process, if the system had remained unchanged. And when large groups arrived, check-in through security desks was a time-consuming process.

First step: the platform

In 2014, the site moved to a software-based visitor management system with local

servers to house the data. Employees could use the platform to register their guests in advance of the visit. When guests arrived, the security staff would have a running start in registering the guests.

Limitations to the system remained, however. If the details of a visit changed (new time, additional guest), there was no way to modify the visit in the system. Hosts would need to set up a new visit and contact the security desk to disregard the previous one. Once again, multiple emails were needed and the platform only managed part of the registration process. Additionally, periodic glitches with the local servers for the platform would temporarily block visitor registration.

There were also significant gaps in the guest experience. While there were best practices in place, there was no guarantee

that every guest was having the optimum experience. For example, how do guests get directions to the campus, and instructions on where to park and find the visitor entrances? When are guests given the site brochure, with the OSHA-required safety and security policies?

There was no way to streamline the process to make sure each guest received an optimum experience. The team recognized new options in the visitor management market could address these concerns. A substantial upgrade became highly appealing for the site.

The right time

A decade ago, self check-in kiosks were already in wide use in airports, but similar devices for corporate settings were still bulky, unattractive, and expensive. Facility managers face these cost-benefit decisions all

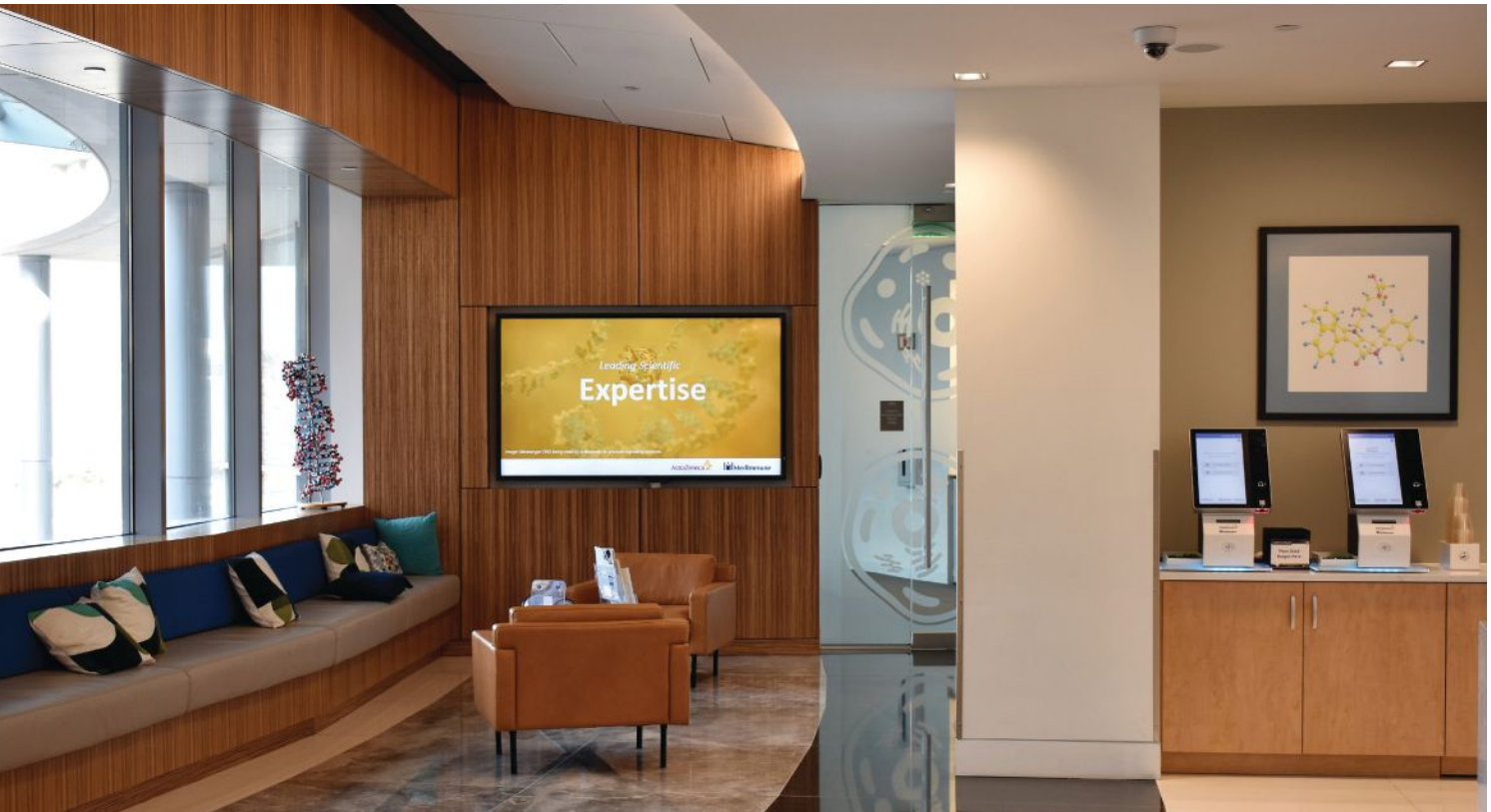
the time — when does it make sense to upgrade? What goals will be met by doing so?

For the Gaithersburg site operations team, the decision to upgrade the visitor management system was given some urgency by facility renovations that included the main lobby of the largest building on site. This renovation allowed integration of smaller, more attractive, and more affordable kiosks into the lobby redesign.

At the same time, the lobby was opened to the surrounding areas and secured with turnstiles that can read both employee badges and visitor passes. The lobby renovation provided an opportunity to pilot the turnstiles before planned deployment to other buildings in 2020. Additional kiosks were deployed to other building lobbies, so the same visitor management process was applied across the campus.



Data security and privacy had to be considered before a solution was chosen. Guests to the facilities are welcomed by invitation, and the system had to provide a secure online platform with cloud backup that connects to kiosks in the lobbies.



Security guidance

As a result of a discussion with other sites, a planned tablet-based visitor check-in solution was tabled due to the impending EU General Data Protection Regulation concerning data privacy. The Gaithersburg team was advised that the tablet system allowed visitors visibility into people working at the site through a searchable building directory. While that option may be beneficial in some industries, it was not the preferred modality for this company.

Data security and privacy had to be considered before a solution was chosen. Guests to the facilities are welcomed by invitation, and the system had to provide a secure online platform with cloud backup that connects to kiosks in the lobbies. The chosen solution met all these requirements before it was implemented.

The visitor lifecycle

Under the new system, employees create a visit through an online dashboard. Once submitted, an email is sent to the guest(s). Using a link to the system, guests pre-register for their visit online. With a QR code

The new system met needs from all three “visit” perspectives:

FOR SITE OPERATIONS AND SECURITY

- » System allows tracking of visitors in the event of an emergency
- » System captures metrics related to guest experience
- » Visit details are up-to-date
- » Cloud storage eliminates vulnerability to local power and IT glitches and saves space

FOR HOSTS

- » Employees can register visits as the host, or for another host
- » Details of a visit can be adjusted and shared
- » Groups can be registered
- » Confirmation of visit is shared immediately
- » Hosts are notified as soon as the guest checks in at a lobby kiosk

FOR GUESTS

- » Guests receive an email that guides them through the pre-registration process
- » Guests can read and acknowledge important site policies and receive directions to the campus

in their smartphone (or just their name), guests can check in at the kiosks upon arrival, which sends an email notification to the host. The host meets their guest or group in the lobby, swipes their badge at any kiosk to complete the sign-in and guest badges are printed.

Despite the many benefits of the “virtual reception,” Gaithersburg still maintains a reception/security desk in each building, as well as a campus concierge in the campus’ main facility. The security team can address visit-related issues, check baggage for out of town visitors, or complete registrations if necessary. The security staff are also needed if an employee shows up to greet a guest without their own badge – which of course never happens! **FMJ**



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BY DR. HIMANSHU KHURANA

FMJ EXTRA
Article

Hidden Hazards: Health and
Safety in Museums and
Art Galleries

PRESERVING ANCIENT ARTIFACTS

How museums use advanced technologies to protect collections, staff and visitors

Museums face the daunting task of preserving and protecting collections of artifacts and objects of artistic, cultural, historical or scientific importance while making those collections safely accessible to the public, researchers and others.

These collections face a wide range of threats from theft to fire, and even a minor fluctuation in temperature or humidity levels can harm or destroy fragile objects. Meanwhile, they are also responsible for providing a safe, manageable environment for their staff and visitors. And they must do all of this in a sustainable, cost-efficient way.

As a result, many museums have come to depend on advanced technologies to manage their facilities. These technologies include integrated building management to control the environment, digital video management to monitor activity and identify threats, data capture and analysis to manage crowds and fire detection systems to protect their facility's collections and occupants.

Here are some of the latest technologies that help museums monitor and control environmental conditions and enhance security for their collections.

Integrated Building Management Systems

To maintain optimal environments for temperature and condition-sensitive museum pieces, integrated building management systems control, continuously monitor and improve the operations of HVAC systems. They can also save money for environments that require a lot of energy usage.

The San Diego Natural History Museum, which exhibits everything from precious gems to dinosaurs to presentations on the human genome, wanted to introduce precision climate control in key exhibit areas. This would help them gain energy efficiency and integrate systems to a common platform to access energy management data.

They accomplished this by using a web-enabled building management system that integrated existing systems into a single interface. By evaluating their needs and moving to a newer system, they generated energy savings, improved building management and reduced maintenance costs. In just one example of how technology improved the facility's ability to meet its mission, a key factor in enabling the museum

to host the Dead Sea Scrolls exhibit was its integrated building management system's ability to allow the exhibit managers to verify that their facility had precision control over the temperature and humidity.

Along with lowering the risk of damage to artifacts, an increased ability to monitor and create optimized temperatures helps museums better support environmental sustainability strategies. It also creates a more comfortable environment for their visitors.

By taking enterprise-wide control of HVAC and mechanical systems, facilities can trend energy usage, predict peaks and decrease wastage. The ability to continually make educated improvements to their environments helps museums save energy consumption and reduce costs.

Digital Video Management

Digital video management enables museum personnel to quickly identify and address threats as they're happening — whether it's a thief or a water leak.

Monitoring and control capabilities are now easily added to an integrated building system and can include devices such as



At the Ny Carlsberg Glyptotek museum in Copenhagen, better-informed decision making and the move to a predictive maintenance strategy has freed up around 20 percent of maintenance capacity, which is now used to address other site requirements.

closed-circuit television (CCTV) and dome cameras. These systems capture surveillance footage through the entire museum as well as provide notification alarms when breaches occur. As an added benefit, the cameras contribute to a facility's energy conservation efforts by recording when they sense movement and conserving energy at other times.

A digital video management system can include a scalable, IP-based digital video system that captures and stores video from the facility's cameras for personnel to retrieve easily when reviews of certain areas are needed.

To go a step further, facilities can take advantage of advanced technology that combines digital video management with automation, analytics and visualization. This type of system can provide museum personnel with a holistic view of all video feeds, alarms and notifications of possible threats from a singular platform. A user-friendly design

empowers users to react quickly without the need of advanced training.

Through an array of security officers, cameras, alarm points, card readers and an RFID system, personnel are able to monitor artifact movement and associated environmental conditions, thereby keeping them safe from theft or environmentally harmful conditions.

Data Capture for Maintenance

In a connected building, data is captured and analyzed in near real-time. Building systems can monitor the flow of traffic, which allows staffing or security levels to be adjusted in different areas as needed.

Some museums offer mobile apps on smartphones to gain intelligence on visitors' locations and other useful data. These apps can help visitors navigate the museum while enabling museum officials to analyze the resulting data to gain insight

into foot traffic and flow.

For example, museum officials can use this information to identify high-traffic areas, which may need more staffing, security, or other forms of attention. This smart building approach affords many opportunities to museums to harness data to enhance the experiences of staff and visitors, as well as helping it to deploy staffing resources efficiently.

Similarly, properly analyzed data can help deploy maintenance resources more efficiently. With the help of connected technology, museums can utilize data to inform effective predictive maintenance. Moving to a flexible maintenance schedule that is focused on maintaining overall performance, rather than ensuring a specific asset was visited a pre-determined number of times, can be more efficient and cost-effective.

For example, at the Ny Carlsberg Glyptotek museum in Copenhagen, better-in-

formed decision making and the move to a predictive maintenance strategy has freed up around 20 percent of maintenance capacity, which is now used to address other site requirements. This makes the maintenance team even more productive and generates greater value from the same level of investment.

By using data to effectively optimize staffing and prioritize maintenance tasks, museums are able to boost energy savings, increase the longevity of their systems, and ultimately, increase operational performance and efficiency to impact their bottom line.

Deploying Fire Detection


Fire emergency detection and evacuation are extremely critical to museums. Fire detection systems enable museums to protect their irreplaceable collections as well as their staff and visitors. Here are two examples of how a smart, centrally managed system can ensure that the museum protects its collections, staff and visitors from harm.

A smart fire emergency detection with central management and evacuation can help to ensure a risk-free environment for

exhibitions and museumgoers. High-tech fire alarm systems provide system integration with low operation costs and allow for customization for a museum's future needs. These systems also help with evacuations by emitting a distinct sound (like white noise) that can be heard across all frequencies of the human hearing range and does not conflict with traditional fire alarm audible devices. This technology helps to guide visitors and staff to the nearest exit, reducing evacuation times in a museum by up to 75 percent.

To protect irreplaceable national treasures and works of art from fire, facility managers can also deploy an early smoke detection system that is hundreds of times more sensitive than a traditional point detector. Even when smoke has been diluted by a draft blowing through the building, or by air conditioning, it will be detected, and an alarm will be raised. To prevent false alarms and unnecessary panic among visitors, the alarm levels are adjustable.

Museums are charged with managing their spaces, protecting their precious pieces, reducing costs and improving the visitor experience. Advanced technology

helps accomplish these ends by enabling them to create an environment that is safe and secure for its collections, staff and visitors while also being sustainable and cost efficient to maintain. The power of connected technology helps museums all over the world continue to preserve our cultural heritage. 

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BY JEFF REVOY

Sensor. security

ENSURING
—
DATA
—
PRIVACY

Sensors and beacons are fast becoming critical to managing the modern workplace. These eyes and ears of the Internet of Things (IoT) gather information that allows facility managers to optimize a workspace and create employee-friendly environments. However, sensor and beacon technologies are relatively new to the FM industry and few best practices exist to address data security and privacy concerns. As more devices are deployed, the need for safeguards to protect sensitive information grows.

There are three types of sensors prevalent in modern workplaces:

MOTION SENSORS

Determine the presence of nearby people and objects. A common use is for turning lights on and off based on whether someone's in a room.

OCCUPANCY SENSORS

Used to collect real-time data about space utilization. Infrared sensors determine if someone's sitting at a desk, while imaging sensors track movement in and out of doorways.

INDUSTRIAL IOT SENSORS

Uncommon in general workplaces, but they are found in industrial spaces. They're used to analyze machinery sound frequencies, vibrations and temperature. If problems arise, sensors alert facility managers.

Always watching

Anyone who's worked in an office has likely encountered sensors and beacons of some kind — even without knowing so. The badge scanner they used to enter the building? That smartphone app that lets them book a meeting room? They're all sensors.

Beacons are slightly different. They require connection to a smartphone app and provide a plethora of information about available meeting rooms, open workstations, location of colleagues and emergency situations. Beacons are small devices that transmit data via Bluetooth Low Energy (BLE).

Unlike sensors, beacons don't collect or receive data. They transmit information that says, "I'm a specific beacon." A nearby smartphone app picks up that information and sends to a server. An example of a beacon in action is a wayfinding app that uses beacons to find individuals in a facility then provides dotted-line directions for them to follow.

At their core, sensors and beacons are designed to help facility managers and other leaders improve employee experience while improving how workplace real estate is utilized. With any new technology, there are inherent risks in using IoT technologies like these to collect and analyze data. Employees may feel "Big Brother" is monitoring their every move and the information collected will work against them.

Additionally, improper security protocols may expose companies to data breaches through what is believed to be a benign sensor network. Managing these risks is a challenge, but organizations can conquer these risks with the right planning and strategies.

Detering hackers vs. privacy

In the United States, workers have no real legal expectation of privacy in the workplace. Employers can read emails, look at calendars and monitor pretty much anything employees are doing in the office. European law offers more protection of individual rights, but the issue is finding a balance between employers' and employees' privacy expectations.

The workplace management industry hasn't had in-depth conversations on what type of data is and isn't appropriate to collect using sensors and beacons. Companies often express little interest in

Less is more

As the IoT expands, sensors and beacons will play a much larger role in workplace management. New technology is undoubtedly exciting, but the smart path is restraint of use. Before implementing sensors and beacons, facility managers should consider the following:

WHAT DATA ARE YOU COLLECTING?

Organizations tend to gather information for information's sake. This not only clogs cloud storage, but it also exposes companies to privacy and security concerns. The answer: Collect the minimum amount of data needed to achieve the goal of using sensors and beacons in the first place. Do you need to know how many people are in a meeting room? Machine vision-based sensors can determine that without identifying individuals. Anonymizing information provides needed analytics while protecting privacy.

HOW IS THE DATA TRANSFERRED AND STORED?

Sensors and beacons require a network connection to share collected information. Does the data leave your company's walls to an outside data service, such as AWS or Google Cloud? If so, what information is transmitted and is it identifiable? What are the encryption protocols before, during and after transfer? Organizations must ensure the highest level of security regardless if collected data is stored on- or off-site.

WHO HAS ACCESS TO THE DATA AND HOW'S IT USED?

Sensor and beacon data are used for two purposes: to improve employee experience and to help make strategic workplace and real estate decisions. Access to this data should follow the "less is more" standard.

information about individuals; they want aggregated workplace metrics from sensor and beacon networks.

Any data collection comes at a risk and information collected by sensors and beacons is no different. First, there's the potential of inadvertently — or deliberately — releasing data to third parties such as survey organizations. Sensors and beacons can gather highly detailed information about employees, from name badge scans to where an individual is located in real-time within a facility. But a greater risk may come from hackers accessing confidential or sensitive information through these networks.

A sensor system on a corporate network may become a channel for cyber criminals to reach personnel, financial and strategic information. The best solution is to put sensor and beacon tech on its own wireless or wired network independent of other corporate systems. If a sensor system

is compromised, hackers can't get to the larger pool of company data.

Power of protocols

Organizations that use sensor and beacon networks in-house should strengthen security to the highest level possible. But for the majority of companies that outsource data management, the onus of keeping company information safe falls to trusted third-party vendors.

So, who can be trusted? The following security-related certifications are a good starting point:

SOC 2

This protocol focuses on a business's non-financial reporting controls as they relate to security, availability, processing integrity, confidentiality and privacy of

The data gathered through sensors and beacons is invaluable for improving employee experience and helping companies make strategic decisions around workplace and real estate use. A 2018 study by office design company Peldon Rose showed **95 percent** of employees cite physical work environment as critical to well-being and mental health.

sensor and beacon systems. SOC 1/SSAE 18 focuses on financial reporting controls.

GDPR

This European Union standard applies to organizations both inside and outside of the EU that offer goods and services to, or monitor the behavior of, EU residents. It applies to all companies that process and hold personal data of EU citizens, regardless of the company's location.

ISO 27001

This certification demonstrates a vendor has identified the risks, assessed the implications and put in place systemized controls to limit any damage to the organization.

— Risk with reward —

The data gathered through sensors and beacons is invaluable for improving employee experience and helping companies make strategic decisions around workplace and real estate use.

A 2018 study by office design company Peldon Rose showed 95 percent of employees cite physical work environment as critical to well-being and mental health. Sensors can control lighting, temperature and other environmental factors that impact worker happiness. Real-time tracking lets

employees know which meeting rooms and hotel desks are available. Similarly, they can locate colleagues using wayfinding app data. These factors save time, reduce stress and allow employees to maximize their talents for the tasks at hand.

Improving employee experience starts with addressing privacy concerns head on. Company leaders should provide real-world examples of how sensors and beacons are used and how collected information is protected and anonymous, when applicable. For instance, personal data and location are used for wayfinding apps, but employees control whether they use the app and share their information.

Sensor and beacon data can also help improve space utilization. By examining occupancy sensor data from four conference rooms over six months, for example, facility managers may see only two of those rooms are ever in use at the same time. This finding can lead to re-purposing the underutilized rooms for additional employee or collaborative workspaces.

From the simplest convenience of motion detecting lights to the most fundamental insights about which areas of a workplace employees use most frequently, smarter workplace sensors and beacons give facility managers information to maximize oversight. This, in turn, leads to increases in productivity, lower operational

costs, better utilization of facilities and more — affecting both the top and bottom lines of a business' growth. **FMJ**

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Jeff Revoy, co-founder of venture-backed SpaceIQ, is helping lead the digital transformation of the workplace. SpaceIQ's mission is to make the workplace cost effective, more productive, and most of all to create an engaging, interactive environment with employees. Customers include Slack, Tesla, Nasdaq, SnapChat, WeWork, and more. He is a senior executive with leadership achievements spanning all company operations including P&L, sales, marketing and product development. Jeff has strengths in establishing successful company strategies, building and resizing organizations and motivating teams. He possesses significant international/global experience and has been actively involved in mergers and acquisitions as both target and acquirer.



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What is 5G?

5G

The hype for 5G's arrival is everywhere. Cell phone providers are already boasting how quickly they will have 5G capabilities, and tech blogs are making predictions for when the full rollout will be available. Outside of the tech world though, many people don't yet have a good grasp on just how impactful 5G will be on their everyday lives — and facility managers might not yet understand how 5G will most certainly impact their facilities.

WHAT IS 5G?

Like other cellular networks, 5G — the “G” stands for “generation” — will build off the current long-term evolution (LTE) structure using radio waves combined with antennas. The high-frequency bands it requires will involve using a fixed wireless network that employs a higher density of smaller cells. These smaller cells provide significantly increased speeds that are about 100 times faster than current 4G technology.

This new era of technology is a direct result of the growing number of devices connected to the internet. Unlike its 4G predecessor, 5G focuses on mobile technology and connectivity. Because 5G networks will accept small, inexpensive, low-power devices, nearly anything will be able to be connected to the internet. All these extra devices will expand the internet of things (IoT) beyond what exists now. The type of data able to be transmitted will be nearly limitless.

One more key characteristic of 5G technology is its reduction in latency. Latency is the lag time between when data is sent and when it is received. Many experts predict that 5G latency will be reduced to less than 10 milliseconds. For reference, an eye blink is approximately 300 milliseconds. The speed 5G will provide is nearly unfathomable, and so are the possibilities it brings.

WHEN WILL 5G ROLL OUT?

There’s no easy answer for when to expect 5G to become widespread. Some companies, like Apple and Samsung, have already announced phones with 5G capabilities. And 5G is currently available in a few specific test locations such as Houston, Sacramento, Indianapolis and Los Angeles.

Although the world is preparing for 5G, its infrastructure is not yet ready to accommodate its requirements. Towers and antennas will need to be installed closer together than their current locations to allow for the high-frequency bands. Even with the changes that need to happen, most reports predict that 5G will be widely available in 2020.

Once it’s available, the adoption of 5G may take some time, primarily because most 4G devices are not compatible with 5G networks. Although some may joke that technology today is advancing at a “use it and throw it away” pace, the reality is users aren’t likely to upgrade their devices immediately once 5G is introduced, which will slow down the rollout.

Fortunately, knowing what 5G is and what it will require will help facility managers prepare for its demand.

HOW WILL 5G IMPACT FACILITIES?

It can be difficult to say exactly what will happen in the future, especially as there will be technological advancements not yet imagined. But there is some indication of what’s to come within several key industries: education, healthcare, manufacturing and finance.

5G and education

Because of already stretched education budgets, it’s likely that 5G will have a slower implementation on some public educational campuses. Eventually, however, the increased demand on the network with more connected devices will necessitate its full adoption, and many experts predict complete implementation by 2025.

Education will see an increased use of the IoT. In fact, many universities have already begun implementing IoT devices to reduce some of the administrative burden on teachers. Students could, for example, be automatically logged into their classroom curriculum and learn at their own pace, freeing up teachers to focus on individuals rather than a group.

Virtual reality (VR) and augmented reality (AR), which allow classroom experiences to become more interactive, are two more teaching techniques on the horizon. In 2018, Verizon issued a challenge for universities and nonprofit organizations to submit ideas on how to incorporate AR or VR into K-12 classrooms, offering funding and 5G access to the winners. 5G is a necessity for VR and AR to be fully implemented, as it would otherwise overload the network.

A primary concern for educational campuses is safety, and 5G developments will certainly help address that concern. One possible implementation is more widespread acceptance of radio frequency identification (RFID) cards for improved security. Increased connectivity also translates to more instantaneous updates of security breaches, such as improved device notifications and communication with first responders.

5G and healthcare

With the healthcare industry growing at such a rapid pace, it makes sense that 5G would be poised to help further that growth. The demand for telemedicine is already on the rise, especially in rural areas with limited access to healthcare facilities. For telemedicine to continue to grow, it will require networks that can support real-time videos, and 5G will provide the mobile networks necessary to make that happen.

In addition to telemedicine, the healthcare industry is finding more uses for wearable devices that gather data and information for remote monitoring or even preventative care. The real-time monitoring needed for these devices will demand the increased connection speeds and decreased latency that 5G brings.

5G and manufacturing

Some may think that manufacturing would be one of the last industries to embrace new technology like 5G, but the opposite is true, due in part to its growing reliability on the IoT to keep their devices connected and help prevent downtime.

From procurement to distribution, manufacturers are connecting more sensors and devices through the IoT to provide them better insight into their supply chains. They rely on devices to help improve operational efficiency and enforce quality control. The more devices that are connected, the higher the bandwidth will need to be to keep manufacturing facilities online.

Artificial intelligence (AI) is another cutting-edge aspect in the manufacturing industry. This is an area predicted to see significant growth once 5G has been fully implemented so that the real-time information will allow AI devices to become more reliable and efficient.

5G and finance

One of the reasons the finance industry has been arguably slower than others to incorporate technology is because of the need for improved cybersecurity. 5G will provide the lightning-fast speeds needed for that security.

The onslaught of connected devices from 5G will more than likely make mobile the main channel for banking in the near future. Wearable devices will allow common banking transactions to be made on the go. Personalization from these devices could allow banks to provide not only better customer service but also better lending insights and risk assessments.

In fact, the data collected from customers will help banks protect their accounts as well as create more automated services. For example, an automated financial assistant could provide advice on wealth management or monitor budgets to remind customers when they are reaching limits.

HOW CAN FACILITY MANAGERS PREPARE?

The coming advancements with 5G can be exciting, but for a facility manager, they can also seem overwhelming. With 5G's impact on so many industries, it's important for every facility manager to understand how to best prepare for its arrival. They can start by assessing their current duct structure to determine how much space is available. As available space shrinks with every change or addition to their networks, facility managers need to start thinking about a plan for upgrades.

EXISTING CONDUITS

Even with limited space for network expansions, there are still options for growth. The best way to upgrade a facility's infrastructure when there is little room for expansion is by utilizing all the available space within the conduits. For existing conduits that already have one or two cables placed, installers can pull more cables within that same conduit by using a fabric innerduct. Serving as a divider between the cables and preventing cable-on-cable friction, a fabric innerduct

is also a good option for data centers or other high-bandwidth areas.

NEW CONDUITS

When laying new conduits, the most important aspect to consider is future needs. Although it may be difficult to fathom needing more bandwidth, facility managers should incorporate allowances for expansion by leaving physical space for any upgrades or changes that need to occur. Additionally, they should consider how to avoid or minimize disruptions during future upgrades.

In order to prepare for future situations where facility managers will need a modest level of flexibility, they should ask their engineers to account for additional open pathways by using segmented conduits during the construction phase. A segmented conduit has a fabric divider that allows for multiple pathways within one conduit and makes the best use of conduit space. This small consideration not only allows room for future expansions but also keeps civil disruption to a minimum. With a spare pathway already in place, facility managers may be able to avoid boring additional conduits

in the future, helping keep the usual ebb and flow of their facility or campus undisturbed.

Facility managers don't have access to a crystal ball that tells them what to expect and how it will impact their facilities. In the case of 5G, however, at least some of the coming changes are clear. Preparing and planning for 5G now will help facility managers avoid short-sighted solutions and enable them to approach upgrades with the long-term benefits for their facilities in mind. **FMI**



Dale Willis brings more than 20 years of experience in the building materials, consumer and industrial markets and leads Milliken Cable Management — a business within Milliken & Company that's leading the data communication network industry with insightful problem solving and future-proofed, cost-effective solutions. Willis's strategic planning, management and branding skills position him to identify needs in the market and deliver solutions. He received a Bachelor of Science in Civil Engineering from West Point and an MBA from Case Western Reserve University.

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BY ALANA F. DUNOFF

Who's Next? The State of Succession Planning



For over a decade, facility managers have been listening to speakers and authors sound the alarm for pending generational shifts in our workforce. They say we are going to experience a talent gap, and filling facility management jobs will become a significant challenge.

Even the major facility service providers have talked about how important it is for the industry to create programs to attract Millennials. For years they have talked about making FM a career of choice and working

with academia to develop educational programs to train our youth. Losing a large percentage of the industry's workforce — and the applied knowledge that represents — is a major modern risk in our industry.

To prepare for this generational shift, FMs have transformed our workplaces and spaces into cool, funky-designed, unassigned, work-anywhere-in-the-building environments. Facility managers became change management agents as we helped our organizations work differently using benching, hives, phone booths and coves so that they can collaborate, scrum and innovate in a diverse and inclusive office. Many of the drivers behind these physical workplace changes were a calculated management effort to attract young professional to come work for our companies.

It is now 2019. The Baby Boomers are retiring at record speed, the Millennials are almost all in the workforce, and Generation Z will start entering the job market very soon. So, have we solved the actual problem?

What's the problem?

According to IFMA Foundation's Global Workforce Initiative (GWI), more than 50 percent of seasoned FMs are retiring within the next 5-15 years, taking their vast institutional knowledge with them. The GWI estimates there will be more than 500,000 FM job openings globally over the next five years. These staggering statistics would suggest the gap in our FM work-

force is not getting any smaller — and perhaps the schism is getting wider.

FM educators at accredited FM degree programs help emerging FM students gain the skills and confidence they need to be successful in our industry. However, all the accredited programs combined only graduate about 800 students a year, not even close to the 500,000 job openings.

The burning questions from the GWI and for all of us in FM should be: How do we fill this big talent hole? Why hasn't it been filled yet? And is it even possible?

In searching for some answers, seasoned IFMA Fellows (many of whom are now happily retired) and recent FM graduates (just starting out in their careers) were surveyed to find out their take on the state of the industry. Both groups were asked how they perceive professional growth, career advancement and success planning.

Career advancement

When it comes to opportunities for career advancement, IFMA Fellows and emerging FM leaders all found new job opportunities both internally and externally. While the Fellows spoke of career longevity within their companies (20 or 30 years or more), the emerging leaders discussed a very different reality. They expressed concerns over minimal opportunities for internal growth, lack of loyalty and companies only valuing their contributions



MAKING FM A CAREER OF CHOICE

This year, IFMA is providing free registration to 20 FM students to attend Facility Fusion and an additional 50 FM students to attend World Workplace – on top of the 25 to 40 scholarship winners normally in attendance. Approximately 90 to 100 students will attend World Workplace in Phoenix and are seeking opportunities to learn and network with industry professionals.

The IFMA Foundation created a World Workplace student experience committee dedicated to engaging future FM professionals into our organization. The committee will ensure they get the most out of the conference and can network with their peers and FM professionals. The committee is comprised of previous student scholarship winners, IFMA Fellows, IFMA chapter and council leaders, IFMA Young Professionals, IFMA Foundation Global Workforce Initiative Advisors (Sodexo and ABM) along with Foundation Trustees and staff. Their focus is to ensure that students attending World Workplace are introduced to all that IFMA has to offer to further their education and careers.

At Facility Fusion in Atlanta, World Workplace Europe in Amsterdam, and World Workplace in Phoenix, students have an opportunity to learn about the organization, interview for jobs with GWI advisors and participate in the IFMA Foundation's Ignite FM! Student Challenge. Students have three hours to solve an FM problem and then present their solutions to an audience of IFMA members. Consider supporting students and the program by contacting the IFMA Foundation for more information.

when they say they have another job offer someplace else. Some of these emerging leaders have already held two to three jobs in the last five years at strong companies where upward mobility was not obvious, available or simply denied.

In the workplace these days, it is often seen as a liability if you stay at a company too long. The expectation seems to be you gain more experience by moving around. But the byproduct of this attitude is that for years now management has not placed as much emphasis on nurturing and growing talent. Overall, they don't even have budgets or the time for training, association memberships or other programs that would help a shining star grow, rise and stay within a company.

Formal evaluation

These days formal evaluation processes are common in most organizations. In many organizations, it is a time to set SMART goals or STRETCH goals and to talk about future professional opportunities. These evaluations are performed rather mechanically with more focus on getting them done rather than on the value they are intended to provide.

The feedback received seems to suggest that even with a formal HR process, the key to true advancement is not annual performance reviews. As Chris Rios, an emerging leader and a facilities coordinator said, "I wouldn't give credit to any processes in my organization ... but rather to my manager who realizes my potential and capabilities."

The key to advancement is having a great manager, not a great process.

Succession planning

We all talk about how important succession planning is, but it doesn't seem like it is a common practice or a high priority anymore. Most organizations don't have a step-by-step guide to climbing the corporate ladder. And most of us don't spend a lot of time thinking about what the next rung is, let alone how to get there.

When the Fellows became managers

themselves, they all seemed to understand the value of succession planning by growing talent internally, identifying those who wanted more opportunities and mentoring them, creating cross-training programs, and encouraging staff to learn by enhancing their skills, getting certifications and actively engaging in associations like IFMA.

From the emerging leader's perspective, succession planning is almost non-existent. There appear to be few clear internal processes for making their way up the food chain. When we used to have corner offices, it seemed that there was often a path to get there. Now we don't even have offices, let alone any direction for how a young professional can become a leader in their organization.

Khadija Qurbanzada, a Temple Facility Management alumnus, had a position as an assistant facility manager. She expressed her desire for more responsibility and pay, but the opportunities weren't there. She says, "I need a chance to prove what I'm capable of," but with limited internal options the easiest thing for her to do was to move on to a new company.

Reframing the problem

All these insights — from our legacy and our future — have shown we need to re-think the problem we have been trying to solve.

Yes, there is a gap in the workforce, but it can't just be about "building a cool space and they will come." If we want to fill our FM workforce gap, we need to actively, and aggressively, be mentoring and providing real succession planning for our emerging FM leaders. We have been calling them leaders, but we are not giving them the opportunity or teaching them how to lead. We are driving them out of our organizations by not providing them a path for upward growth.

Generation X to the rescue

IFMA is quickly coming up on its 40th birthday, and according to the GWI, the average age of the FM practitioner is 49 years old.

That means that there are a whole lot of Generation Xers, in their 40s and 50s, who are currently working as mid-level managers. These are the managers who are going to feel the impact of trying to fill the workforce talent gap.

For decades, Gen Xers have been overshadowed by their older and over-populated Baby Boomer predecessors. Then the Millennials jumped in to grab all the attention. Gen Xers have been quietly doing their jobs and perhaps finally getting good promotions now that the Baby Boomers are retiring. To all FM Generation Xers: It is now your turn to do something monumental!

We cannot wait for the gap to be filled by Generation Z entering the work force in a few years. The gap needs to be filled by strengthening the talent we already have so they stay and grow within our companies. This might be a big shock to our organizations, but part of the reason they are losing talent is not because the Millennials get bored and need to move around. It is because they have been neglected. Our organizations need to reinvest in good old fashion succession planning — identify the talent, plant the seeds, water them and watch them flourish.

It is our responsibility as FM leaders to make the time and the find resources to mentor, coach and teach the next generation to be true emerging FM leaders. And we may have to take a stand to remind our senior management that these fundamental processes need to be revitalized for future success.

We need to remember that our own successes came from a mixture of our own determination and great leadership. It is time for all of us to pay it forward. FMJ

Alana F. Dunoff, ProFM, FMP, IFMA Fellow has a passion for FM Education and mentoring our future. She is a consultant with AFD Facility Planning, an FMP Qualified Instructor and is an Adjunct Professor in the Facility Management department at Temple University, Chris and Khadija were her students.

If we are going to close the divide of a 500,000 jobs in the next five years, then first and foremost we need to become great managers and leaders.

We all need to train our staff, be active mentors, show our young workforce loyalty and reward them for great work.

We need to find the internal financial resources and then encourage our staff to achieve their credentials, attend conferences and go to local FM programs and events.

We need to take real time to develop succession planning pathways for our staff and then nurture them along the way.

We all need to hire students coming out of accredited FM degree programs and create FM internship programs as an inexpensive way to help enrich their learning experiences as they transition from academia to the real world.

We must be a profession that actively seeks out and takes on the responsibility of nourishing the minds of future FM leaders.



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Together with IFMA chapters and councils and members of the FM community, the IFMA Foundation has awarded more than US\$1.7 million to over 500 aspiring and practicing FM professionals since 1991. Help make FM a career of choice by becoming a scholarship sponsor. Contact Program Support Specialist Christina Gonzales at +1-281-974-5651 or christina.gonzales@ifma.org before the **June 28** deadline.

Meet Jelani Barro, FM student at the New York City College of Technology and recipient of IFMA's New York City Chapter's Worthy FM Student Scholarship:



"The Worthy FM Student Scholarship gave me the financial confidence to apply to my graduate school of choice while completing my final year at NYC College of Technology. Attending IFMA's World Workplace 2018 provided me with a chance to meet FM professionals. I am grateful to the IFMA Foundation and the chapters that helped bring my personal goals closer to reality. I would encourage any student seeking a facility management career to apply for this unique and meaningful experience."

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HydroTreat™ is the future of Legionella mitigation

The cause of Legionnaires' disease, Legionella thrives in building water systems and is prevalent in one out of every two buildings in the world. While recent decades have brought increased knowledge and regulations in terms of Legionella control, water maintenance practices have remained relatively unchanged since the 1976 discovery of the bacterium. Legionella Solutions aims to change this, ushering in a new era in water treatment.

INNOVATIVE WATER, Legionella and Water Treatment Consultants, has released a proven, fast-acting solution to eradicate Legionella. The first of its kind on the market, the HydroTreat™ solution is a remediation program that treats your entire system so Legionella cannot survive. Utilizing a revolutionary, exclusive organic process, the eco-friendly HydroTreat™ solution is a more complete alternative to chlorinated chemicals and non-chlorinated biocides.

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VISIT iwcwater.net

EZ-On™ grid covers: The easiest way to rejuvenate dirty ceiling grids

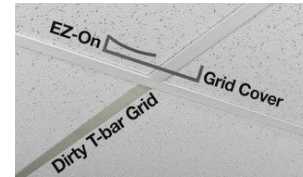
Metal suspended T-bar ceiling grids are durable, but their painted finish is not. A grid that's still completely functional may look terrible – stained, damaged or yellowed with age. Ceilume EZ-On grid covers can update a tired ceiling at a fraction of the time and cost it would take to paint or replace the grids.

Snap-on vinyl strips that cover existing T-bar grids with a brilliant white surface, EZ-On grid covers rejuvenate the appearance of the ceiling system, while also creating a surface that's durable and easy to maintain.

The system has two components – one to cover grid members, the other for perimeter angles. Installing rapidly on virtually all grids with $\frac{15}{16}$ in. (1 in. nominal) flanges, the vinyl strips slide over the T-bar and snap into place easily. No pre-cleaning, adhesives, tools or special training are needed. A 400-square foot room could be done by one person in about an hour.

Made from 100 percent recyclable rigid vinyl in a cool-white, semi-gloss surface, EZ-On grid covers require no maintenance, are easy to clean with soap and water, and are impervious to moisture, resisting mold growth.

VISIT ceilume.com/ez-on



Interface expands Carbon Neutral Floors™ program to include nora® rubber flooring

In June 2018, Interface became the first global flooring manufacturer to declare all of its carpet tile and luxury vinyl tile (LVT) products 100 percent carbon neutral across the entire product life cycle. Now, nora rubber flooring is included in the company's Carbon Neutral Floors™ program.

nora is the commercial rubber flooring systems and solutions brand of Interface. Produced in Germany for more than 65 years, nora premium rubber works to improve operations, efficiencies, health, safety and wellness with sustainable flooring that eases maintenance, absorbs noise and provides added comfort underfoot.

Offered at no extra cost to every customer, the Carbon Neutral Floors™ program helps buyers understand the carbon impact of their purchase. Interface calculates your floor's credentials so you can see its exact contribution to reducing global warming. For example, for every 1,000 square yards of Interface flooring, you offset the equivalent carbon emissions of nine round-trip flights between New York and Paris.

VISIT interface.com or nora.com

GreyOrange launches AI-enabled flexible sortation system

Increased customer expectations for same- and next-day deliveries have created a need among logistics centers for new-generation technologies that can cope with unprecedented volume growth and peak-period volatility.

Portable and efficient, the new GreyOrange Flexo™ modular sortation system is designed for modern distribution and logistics centers serving retail and courier/express companies. Capable of operating 24x7, the AI-enabled robotics system can be scaled up to handle high peaks or down during non-peak hours to minimize operating costs.

Flexo can handle up to 12,000 parcels per hour, sorting up to hundreds of destinations, including common post and courier items up to 15 kgs (33 pounds). Plug-and-play modular components can be added without incurring downtime. And Flexo's portability offers the flexibility to share bots across multiple facilities based on regional peaks.

Recognized as one of the world's top 50 robotics companies by Robotics Business Review for three consecutive years, GreyOrange is based in Singapore, with customer sites in the U.S., South America, Europe and Asia.

VISIT greyorange.com



Flexo's fleet of autonomous mobile robots carry parcels from inducts (where parcels arrive) to the sorting destination using the most efficient path determined by Artificial Intelligence and Machine Learning algorithms.

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Founded in 1919, HOSPECO celebrates 100 years as a leading manufacturer of cleaning and protection products serving the food-service, janitorial, office supply, health care and hospitality marketplace.

VISIT hospeco.com

MCS Solutions rebrands to Spacewell In February, Nemetschek brand MCS Solutions unveiled a new name, a new logo and a new website as part of an extensive rebranding initiative. Spacewell is now the overarching brand name for the Nemetschek Group's activities in the building operations and management segment. MCS Solutions' relaunch as Spacewell follows the acquisition of multitenant SaaS provider Axxerion. An IFMA Silver-level Corporate Sustaining Partner, Spacewell's offering consists of:

- » Smart building product lines powered by the COBUNDU™ IoT platform;
- » MCS IoT-enabled IWMS, including mobile apps for FM teams and building occupants;
- » Axxerion workflow-based SaaS for property/facility management;
- » iX-Haus software for commercial and technical real estate management, voted best commercial real estate software in Germany for three years in a row;
- » O-Prognose long-term maintenance software;
- » Advisory services by independent consultants with deep domain expertise in smart working, facility management, maintenance, catering, cleaning and security/risk management.

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- **Jay Drew**, CFM, PMP, SFP, Facility Project Manager, Connecticut General Assembly, Office of Legislature Management



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Ask the Experts

In each issue of FMJ, IFMA's Facility Management Consultants Council shares some commonly asked FM-related questions accompanied by advice from top FM consultants. The questions and answers presented in this section align with IFMA's core competencies following the themes outlined for the given edition of the magazine. While the following answers are intended to be helpful, these responses should not be deemed complete and are limited in context by the space allocated. Please contact the individual consultants directly for further explanation of the opinions expressed. The theme of this edition of FMJ is "**Managing Modern Risks.**"

CONTRIBUTED BY



The Facility Management Consultants Council (FMCC) represents more than 300 FM consultants from various countries around the globe. Its mission states, "The FMCC is the resource and voice for facility management consultants worldwide to leverage our collective expertise to benefit IFMA members, and the facility management profession."

Today's global marketplace is super competitive. Downtime is not an option. If a business is interrupted, its clients and customers will quickly find a new provider. Thus, business continuity is critical and facility managers play a key role in their company's business continuity planning process. As a facility management consultant, what trends do you see in the in the future of business continuity planning?

Questions regarding the Ask the Experts section?

Mark Sekula

IFMA Fellow, CFM, FMP, LEED AP

President of Facility Futures, Inc.

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A My first step is to replace my “facility” title with “process” and get new business cards. Processes are the key to business continuity, whether they're manufactured goods, delivered services or provided information. Today, all of those may have a facility component, but the future will demand more complexity, mobility and options than ever considered presently.

My second step is to hand a mirror to executives, so they focus inward on their critical input/output process networks. Too many times firms look externally without fully understanding the ramifications internally of their operations.

My third step is to throw out all the white ring binders and challenge staff to analyze 100 percent of their goods/service/data networks. The key question is “What if?” to everything they do. The “I don't know” answers are fertile grounds for investigation.

Business continuity can be interrupted or destroyed by inadequately thinking about supply chains, computer integrity, competitive marketing, critical people, environmental laws and the like. In a global environment, a ship that founders with chemical feedstocks, an invasive database hack, a transit strike, or union rebellion may all contribute to a short-term business upset or a multi-week or month stoppage. The surprise retirement of a key technologist brings lamentations of not mentoring properly. Production using a million bottles in inventory can be stymied when the caps don't fit. A closet fire stops an airplane in its flight, and a surprise ruling by legal agencies can prevent market activities. This is the telescope that looks outward.

The bottom line is a process consultant will help executives and staff truly understand how their total operations can ensure business continuity or be stopped cold if circumstances have not been predicted or not planned for. And there may even be a facility solution!

Dr. Doug Aldrich, CFM, IFMA Fellow

David Reynolds, CFM, FMP focuses on FM strategic management, performance and risk mitigation. He is a founding partner in the Global Facility Management Alliance. David is Secretary-Treasurer and STAG liaison of the FM Consulting Council (FMCC) and collaborates with the Environment, Operations and Maintenance, Health and Safety Community of Practice (OMHS). He is an IFMA Engage ambassador. His community work focuses on safety, health and economic self-sufficiency.

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A

Risk management is an issue that is more and more important for companies. Indeed, they are facing new opportunities and threats in our globalized and connected world. However, it could appear like the “hot potato” in the organization. In other words, “a risk that I do not see is a risk that I do not have to manage and pay for.”

This is one reason we conduct business continuity planning (BCP). It is a laudable initiative (and often required by insurances) but difficult to implement because it imposes the acceptance to look at the weaknesses of your organization.

In my view, the first major trend in BCP is to become more flexible — just like the world we are living in. A few examples can be considered such as the uncertainty regarding Brexit, the yellow jacket movement in France or the Venezuelan political crisis. The common thread between them is they are all unpredictable. How can a company, which holds its BCP committee once or twice a year, effectively face it? Especially if the decision-making process takes a long time.

Yet, technology like blockchain or big data will have a role to play in the tomorrow’s BCP. With the democratization of the former (the In/Out building in Paris has been sold using blockchain, a world first) and the huge pool of information available with the latter, BCP could go from a heavy tank to an indestructible and fast Iron Man.

However, Iron Man does not work alone. He has a team. Moreover, in light of the world becoming even more competitive, he is also becoming more collaborative. So must the BCP process.

Total in-house FM delivery has started to disappear, and a few — or all — of the FM activities may be outsourced. This could have some benefits for the organization, but the fact is it adds more stakeholders in the risk management process. In addition, with service providers, there are also the local police department, fire brigades, your insurance advisor, your landlord, your neighbors (often forgotten), and so on.

Do you know who knows how to shut down the gas inlet? What if he is absent? Do you know who his back up is? Do you know how to contact your landlord after hours? These are typical questions one might ask when developing a BCP. For some organizations, BCP is like what environmental issues were a few decades ago: a secondary aim, treated if we have the time.

Today, our outsourcing contracts typically includes an environmental, or waste management, chapter. Sometimes, they are even part of the KPI. We all know that when a crisis happens, if the BCP is not prepared and if people are unaware of it or participants are not properly trained, the consequences could be disastrous for the business. So, why can’t business continuity be part of the contract to cement the collaboration?

Business continuity management is a significant benefit for companies. It even has his own standard (ISO: 22301). Maintaining a BCP is an endless process because zero shutdown is impossible to promise. If you cannot delete the risk, technology and strong partnerships could help you to anticipate it and react quickly.

Tristan Ragusa

Tristan is a French student in facility management who will be obtaining his master’s degree by September. At the same time, he is working to earn his FMP credential (in April, if all goes well). Currently he is working in an apprenticeship as a JLL Assistant Facility Manager.

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A

Emergency planning and business continuity can stand out like the proverbial stepchild among the eleven FM competencies — it is acknowledged, but not always warmly welcomed in day-to-day business processes.

There are so many potentials to consider: flood, fire, wind storm, earthquake, explosion, chemical spill, active shooter, loss of lease or decrepit building, lawsuits... Before we change the subject, what future considerations must be addressed when it comes to business continuity?

Communications for customers, patients, clients, staff and providers.

Update the business and brand in people’s minds. Cloud computing can serve up a familiar work environment for critical functions, data and communications from anywhere. Staff working from home or in mobile offices can be largely unaffected and temporarily take on additional work if the electronic work environment is intact.

Recovery and repair-as-a-service. Contracting in advance gives top priority to protecting contents and providing security. Technology can show a response team where to find and treat critical items in the affected property.

Major assets as a service. Create plans for energy, HVAC and large-scale efforts to keep out wind and weather. Contracting in advance can reduce lead time decisively. The emerging business model of OEM equipment-as-a-service is a trend to watch.

Finance. Create a contingency budget for severe but unlikely events. Insurance coverage may be slow to pay out. Setting aside a large amount of cash that would otherwise enable response to business opportunities is not ordinarily an option. As part of planning, CFOs should explore agreements for priority receipt of short-term funds not dependent on local sources only to enable continuity activities.

IoT. Just as for business communications, equipment data and control functions help FMs know and control facility conditions preparatory to recovery. Remote IoT communications use mobile telephone data connections. In the event of regional disaster, developments now include efficient data carriage on older channels such as VHF radio.

Bodies of knowledge. Commercial, public, and not-for-profit organizations provide readily accessible policy, assistance, education and information exchange for business continuity.

David Reynolds, CFM

FM-CONSULT-CREATE

With five decades of industry experience and FM consulting, Doug is a strategic leader, laboratory expert and globality advocate. He was IFMA Chair, co-founded the R&D Council, served on advisory boards, communicates in word and print and helps non-profits.

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Components in Focus

Greater Orlando Chapter Participates in Facilitathon and Internships

The Greater Orlando Chapter of the International Facility Management Association is taking action to address the skilled labor shortage in the industry. The association and the IFMA Foundation have been actively involved with several initiatives to address this shortage, including programs aimed at making facilities management a career of choice.

The Greater Orlando Chapter joins other IFMA chapters in working with Skills USA (formerly Vocational Industrial Clubs of America) to promote the FM professions and related fields to high school students deciding on career paths.

Chapters host events that go beyond traditional “career day presentations” and provide hands-on interactive challenges in the format of a Facilitathon. This year’s statewide competition took place in Pensacola, Florida on April 7-10, 2019.

The association is also rolling out an internship and mentoring program with local high schools. Chapter members’ companies will offer internships to high school students in the areas of facility management, HVAC, roofing, construction and many other areas.

Finally, the IFMA Foundation offers scholarships to students currently in college to pursue FM-related professions. More than US\$100,000 worth of scholarships will be awarded, which include expense-paid trips to the association’s World Workplace conference in Phoenix, AZ in 2019. Attending the conference will offer students education and job networking opportunities.

New Designation and Digital Badge Available for Members

The IFMA Foundation has just announced the IFMA Facility Management Graduate (FMG) Designation and Digital Badge. “The new IFMA Foundation FMG designation gives graduates of FM Accredited Degree Programs in good standing a special recognition for their completion of a post-secondary program in facility management” said Graham Tier, IFMA Global Chair. “Most importantly, IFMA and the IFMA Foundation recognize the specific qualifications and skills that graduates of the FM Accredited Degree Programs possess.”

As a global FM accrediting organization, the IFMA Foundation has increased its focus on filling the gap in the professional FM workforce through its Global Workforce Initiative, which includes increasing the number of FM Accredited Degree Programs throughout the world, providing scholarships to students, as well as expanding the awareness of the FM profession. “This designation is important to facility management professionals to be able to demonstrate their knowledge and skills to employers. Earning the FMG designation and digital badge are a significant way to present that value” said Nancy Sanquist, IFMA Foundation Chair.

Digital FMG badges are currently available to graduates of the Facility Management Accredited Degree Program free of charge. Degree holders can apply for their badge with IFMA by filling out a form online at www.ifma.org/my-account/camp.

IFMA and the IFMA Foundation are partnering with Credly, a top digital badging company, to provide this service through their platform, Acclaim.

SOMANCHI VENKATA SURYA SUBRAHMANYAM



As principal manager of administration and facilities, Somanchi has spent nine years in corporate facility management. Based in the bustling region of Hyderabad, India, Somanchi chose a career in FM to provide effective and reliable support services to the facility’s business units. Making a difference and serving business goals are two main motivators for Somanchi’s success.

Personally, I love to stay active!
Follow-up with me on Cricket.

TIMOTHY KONTOULAS



For a decade, Timothy has been growing his career in FM. Based just outside Mebane, North Carolina in the city of Saxapahaw, Timothy transitioned into his role as mobile engineer from a career in HVAC. Prior to being introduced to facility management, he didn’t even know the field existed. Once he learned of the available opportunities, he used his knowledge to move into the corporate FM world. Connect on LinkedIn: www.linkedin.com/in/timothy-kontoulas-5741a9165.

I am a tool nut. I have had an unusual interest in tools and power tools since I was a child and have acquired an excessive inventory over the years.

TUYET HUYNH



The sheer variety of work available drew Tuyet to a career in facility management. Based in Houston at a higher education facility, Tuyet began more than eight years ago with a role in facilities planning and maintenance. Over time, Tuyet moved into a contract supervisor role in a facilities building maintenance and renovation department. Professional freedom and the ability to learn new skills have provided Tuyet the opportunity to thrive in FM. Connect on LinkedIn: www.linkedin.com/in/tuyet-snow-huynh

I have enjoyed climbing trees since I was little, and I still do when I can. Can you imagine an adult sleeping in a tree?

systems

integration

for a more

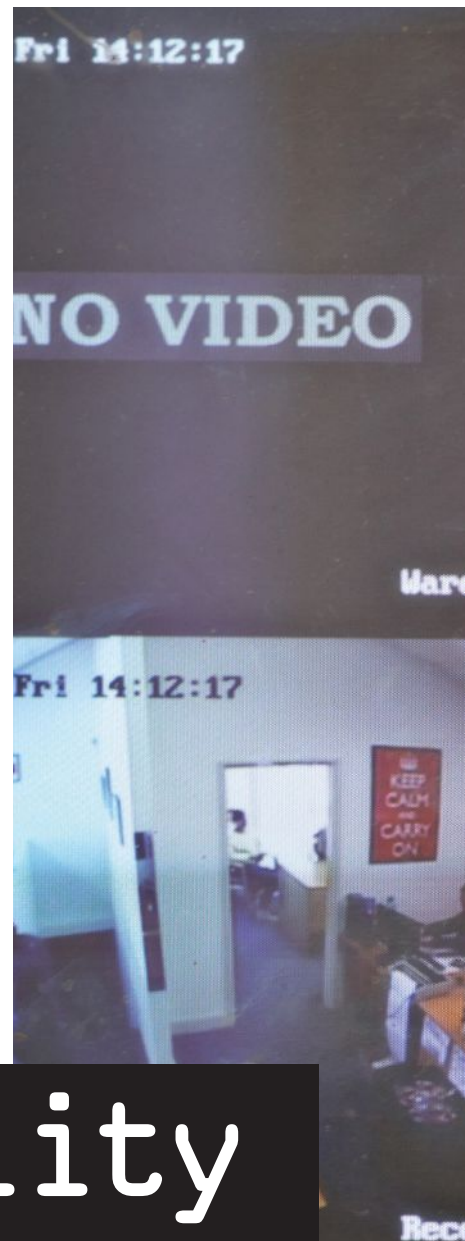
resilient facility

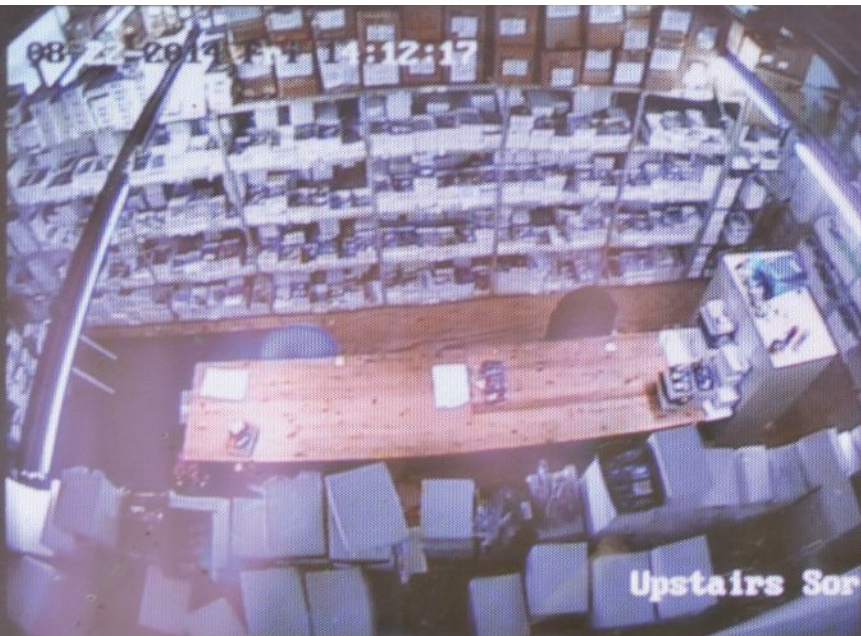
BY JOE OLIVERI

Facility managers and owners have numerous responsibilities with their most significant roles being keeping occupants and employees safe, as well as protecting the physical infrastructure of their business. Unfortunately, catastrophes are always a lingering risk, and they are more likely to affect facilities if they aren't prepared.

The impact of severe weather events — from tornados to wild fires — as well as human-caused events, such as active shooter situations, have heightened the importance of proactively planning for both anticipated and unexpected threats. While it's impossible to prevent such scenarios, facility managers and owners should focus on mitigating vulnerabilities and reducing the impact of damage. This strategy, known as resiliency, has become an increasing priority for facilities.

In times of emergency, it's important that facilities maintain a resilient front while they tend to the damage done. Luckily, resiliency is something that can be practiced year-round. Facilities can plan for the unpredicted by investing in smart, connected security and life safety improvements that enable them to act more quickly during an event and bounce back faster and more efficiently after.





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defining unique needs

Safety planning is not a one-size-fits-all approach for every facility. Keeping a comprehensive safety and security strategy top of mind when designing, constructing and enhancing a building for use is critical. While there are strategies that all facilities can implement, some tactics depend on the unique building vulnerabilities and requirements.

A helpful first step for owners and managers is to consider how the facility is used and common points of stress, as well as the geographic location of the building. For example, a facility in a tornado-prone location faces different risks than a building located by a waterfront. Similarly, a healthcare facility faces different security issues than a school campus, and it's important that each invest in robust systems to help safeguard equipment that is vital to operations in the event of an emergency. For healthcare facilities, it's ensuring that medical equipment can withstand a catastrophe, while school campuses must have a lockdown procedure in place to help students and faculty stay safe in the event of an emergency.

Once owners and managers understand the individual needs of their building, it becomes easier to determine which systems and technologies should be prioritized for updates, integration or replacement. Enlisting a single-source provider for connected solutions can help in the selection process of choosing the right services or products as they're able to evaluate all systems from a holistic point of view. This approach can also make aligning additional technology upgrades a simpler process in the future.

advantages of integration

Facility managers might be surprised to find out about the different integration possibilities of not only new systems, but also their existing systems. For example, traditional access control systems can be connected with video surveillance and intruder detection technologies to help maximize the safety of occupants within a building and prevent unauthorized people from entering.

Occupancy sensors and mass notification systems may also be integrated with these technologies to help improve the resiliency of the infrastructure. This comprehensive security strategy allows different systems to communicate with one another automatically, rather than acting as disparate systems. When connected, mass notification systems can use this data to quickly share information with occupants during an emergency, like an intruder situation, based on their location. This level of integration can ultimately help facility managers analyze typical daily happenings that help streamline safety planning. However, they shouldn't stop their safety strategy at security technologies. Fire and life safety systems are complementary of security technologies, so there are even greater resiliency advantages for organizations who choose to connect these systems.

In the event of a fire, an integrated approach to guiding occupants to safety and alerting emergency responders can add value to a facility. The fire alarms can be connected to mass notification systems that can contact first responders while also sending customized messages over an intercom system to communicate the most secure route for building occupants. Meanwhile, the access control solution can help initiate a lockdown or restrict access to an area of the facility that is being threatened. From sending alerts to initiating lockdown areas, security, fire and life safety systems can seamlessly work together to help minimize potential

harm more quickly and efficiently, and ultimately help bolster a facility's overall resiliency.

building systems resiliency

While enhancing safety and security efforts is critical to improving a facility's resiliency strategy, facility managers also need to consider the role other building systems play in their overall plan. In fact, security, fire and life-safety applications can act as the foundation for more systems integration as they can connect to other building applications, like HVAC and lighting.

If a building's HVAC system is connected to its security and fire systems, for example, HVAC systems could shut down in the area of the facility that is being impacted by a fire. They could also be directed to push air in specific directions depending on where the smoke is coming from. This adds yet another layer of protection for occupants and the facility's infrastructure.

Additionally, lighting applications can become more intelligent and assist in resiliency efforts when connected with security systems — especially when it comes to protecting the perimeter of a facility. Perimeter lighting structures can be used as a base for adding on security basics, like cameras and mass notification systems. However, more advanced solutions, such as gunshot detection technology, can also be connected. In the event of an active shooter situation, lighting solutions could be programmed to shine directly on the area where the shot is detected. Simultaneously, the mass notification technology can send out a tailored warning to anyone around the perimeter and separate directions to occupants inside the building.

Integrated, multifaceted building solutions that can communicate real-time information when it matters can help facility managers react more quickly and flexibly to protect people and assets. It's important for facility managers to have solutions in place that are working for them, not against them, in order to maintain a resilient front.

maintaining resiliency strategies

Once advanced technologies are implemented, and systems are integrated to best fit the needs of a facility, building managers are tasked with maintaining their resiliency strategy. This is another area where a single-source provider can be a beneficial partner. They can take over the time-consuming responsibility of managing upkeep and checking to see if systems are working at capacity by scheduling automatic maintenance checks that can send alerts when complete or if an issue is detected. This streamlined approach to overseeing systems integration can help cut costs, improve efficiencies and boost resiliency efforts — ultimately helping set a building up for success in the future.

Planning well in advance for the unknown can help facilities remain resilient every day, and not only when they are in recovery mode. Taking a proactive approach to identifying where systems integration can improve operations and increase response times to potential threats is key. In the constant effort to provide a safe and comfortable environment for occupants, a connected facility is simply a more resilient facility. **FMJ**

Joe Oliveri is Vice President and General Manager, Security, Johnson Controls, Building Solutions North America.



Key Flooring Types and Maintenance Considerations

BY DAN ABITOL AND PHIL CALABRITTO

When it comes to floor surfaces, material selection and cleaning methodologies have gone through many different trends over the years. No matter which new technologies are on the horizon, one truth always remains: quality matters. Nowhere is this truer than in the flooring chosen for a facility. No matter the type of facility, quality materials and quality maintenance contribute to a healthy bottom line and a healthy facility. Stone, terrazzo and carpet are consistently three of the most popular surfaces found in facilities. Chosen for their durability and good looks, there are key maintenance fundamentals and best practices every facility manager should know when selecting and caring for these materials.



stone

Stone will never go out of style, and if properly maintained this surface will last the life of the facility. From marble and granite to travertine and limestone, stone has been used for centuries. Not limited to flooring, stone is used for architectural finishes, on vertical and horizontal surfaces alike, due to its attractive appearance and durability.

Quarries around the world extract these stunning materials from the earth using sophisticated technology and machinery to provide flawless cuts and expert polishing. The selection of stone currently available is impressive because of innovative quarry technology.

Different types of stone may look beautiful side by side or throughout contiguous areas, but stone selection should not be made by aesthetics alone. Stone surfaces, whether vertical or horizontal, interior or exterior, require different care based on material, traffic patterns and usage.

For example, it is not a good idea to pair marble and granite or marble and terrazzo together. Variations of density and hardness, and incompatible maintenance requirements, could cause harm to neighboring stones. Choose stone from the same family or stone with similar maintenance needs, such as marble and limestone, and combine quality installation with a tailored routine surface care plan. This helps ensure the stone will last for centuries.

There is a special safety consideration with stone. After the January 2017 effective date of the Occupational Safety and Health Administration (OSHA) 1910.21 subpart D, *Walking-Working Surfaces and Personal Protective Equipment (Fall Protection Systems)*, more facilities began choosing textured stone surfaces and finishes.

The updated law is designed to “help prevent and reduce workplace slips, trips, and falls, as well as other injuries and fatalities associated with walking-working surface hazards.” Under 1920.21, OSHA defines general industry “walking-working surfaces” as floors, stairways, steps and aisles, among other horizontal, vertical and inclined or angled surfaces.

Textured granite is one of the most popular textured stone surfaces found in commercial facilities today. Textured floors provide a desired level of traction, but many facility managers and designers don’t realize the texture adds to cleaning requirements and appearance headaches and there could be potential safety issues.

Textured floors hold more dirt than smooth floors because there are more nooks and crevices for dirt to hide. Once cleaned, textured floors are harder to keep clean for an extended amount of time. Appearance is important, but even more so is safety. When cleaning chemicals are misused or applied incorrectly to textured floors, detergent, grease, oil and dirt can build up and bond to the surface. The industry term for bonded layers of buildup is plasticization. Once plasticization has occurred, cleaning materials can continue to bond to the surface, making it incredibly hard to clean, and when the floor gets wet, it becomes slippery — the exact opposite of the purpose of a textured floor.

Thankfully, a carefully planned cleaning and maintenance routine can help solve this problem — or prevent it from becoming a problem to begin with. Stone floors, whether textured or smooth, are exceptional architectural finishes for just about all types of facilities. Choosing high-quality materials is the first step in creating beautifully designed spaces. Have an expert surface care consultant provide a long-term maintenance strategy, cost analysis and surface recommendations before the flooring investment is made. A qualified consultant can provide a field assessment and offer recommendations for existing floors that may involve restoration and an ongoing cleaning and maintenance plan.

Choose stone from the same family or stone with similar maintenance needs, such as marble and limestone, and combine quality installation with a tailored routine surface care plan. This helps ensure the stone will last for centuries.

Dos

- ✓ *Hire an expert surface care consultant when installing new flooring and evaluating maintenance plans*
- ✓ *Require surface care providers to perform a demo of their services*
- ✓ *Validate realistic production rates and best practices for proposed services*

Don'ts

- ✗ *Wait to audit your facility's walking-working surfaces to ensure proper traction and compliance*
- ✗ *Hire based on price alone*
- ✗ *Choose surfaces purely on aesthetics*
- ✗ *Underestimate the connection between cleanliness, performance and safety*



carpet

A best practice when evaluating carpet care providers, chemistry and methodologies is to return to the fundamentals of demos and quality control checks.

Nylon and wool, cut pile and loop, tiles and rolls — when it comes to carpet, there are endless possibilities. Unlike stone and terrazzo surfaces, almost all facilities have carpet in at least one space. Unlike other surfaces, carpet is rarely considered a long-term commitment. However, with proper care a facility's carpet can stay on the floor, and out of landfills, well beyond the scheduled replacement date. The environment and the budget will be thankful for that.

Over the past few decades there has been a steady shift away from the science of carpet cleaning, and prospective maintenance partners are now rarely required to demonstrate their capabilities before they are hired. Specifically, the trend has moved away from side-by-side live demo comparisons, which validate the credibility of providers and examine the services competing companies are promising for the proposed cost.

When it comes to production rates, for example, if a company is promising 10,000 square feet (approximately 929 square meters) of carpet cleaning per hour, then run. Yes, that company may be able to perform the task at that rate of speed, but the soil will not be properly evacuated from those spaces. The result will be poor appearance and fiber damage over time.

A process called encapsulation has become popular in recent years. Encapsulation has a place in the carpet cleaning matrix, but it is a value-engineered process that mimics deep cleaning, but it is not certified as a deep cleaning method. When used correctly, it is an acceptable option for interim cleaning between CRI-certified deep wet or dry extraction methods.

Used correctly is the key term. The last critical step when using encapsulation is thorough vacuuming. The fundamentals of proper vacuuming are slipping away in the industry, and some cleaning companies are even eliminating vacuuming all together for cost containment.

Proper vacuuming after encapsulation is a critical step because encapsulation has soil release finishes. Vacuuming at an appropriate rate of speed using a commercial-grade dual-motor vacuum, with one motor strictly devoted to the motor and the other to the beater bar, and triple filtration, will yield the best results. If the soil and product residue are not immediately removed, they will bond to the carpet and will mute the fiber, among other damaging side effects, over time.

Think of carpet fibers as a clear plexiglass tube filled with dye sites and the soil found in carpet as sand paper. Once plexiglass has sand paper applied to it for a few passes, the finish is scratched and damaged, sometimes beyond repair, and has a cloudy or muted appearance preventing you from seeing the color within. The same happens to carpet when dirt, sand and other abrasive particulates are not evacuated properly after encapsulation or on a general routine schedule. Colors become muted and visible traffic patterns appear, possibly past the point of restoration, and costly replacement is necessary.

A best practice when evaluating carpet care providers, chemistry and methodologies is to return to the fundamentals of demos and quality control checks. Filter tests in a three-foot by three-foot (approximately one-meter by one-meter) area. This is one of the easiest ways to check on the status of soil removal. Also, work with a company that has an online data management portal with real-time before and after photos, work orders and other essential reports. This will help tremendously for performance evaluations.

Dos

- ✓ *Extract soil from carpet daily with a CRI certified commercial-grade dual-motor triple-filtration vacuum*

Don'ts

- × *Use vacuums without a dedicated motor to the beater bar or a machine that does not provide agitation of carpet fibers*

One major change coming to the floor care industry is robotics. This technology will become a standard part of a facility's hard and soft surface care in the next five years. The combination of robotics, chemistry and maintenance expertise will ensure consistent surface appearance and help control costs. In addition, these tools will provide more performance data than available today.

terrazzo

Terrazzo originates from Italian craftsmen who learned to mix marble scraps, discarded material and mortar to make new floors. This surface has come in and out of popularity over the years, but one thing is certain: No one considers terrazzo to be a short-term commitment. Institutional facilities like schools, hospitals and government buildings are known for having terrazzo floors. However, the materials fell out of favor in other types of facilities decades ago because it was difficult to install and maintain.

Times have changed. Maintenance technologies and advancements in materials have contributed to terrazzo's growing popularity.

Terrazzo has gone from being a cementitious material to today's modern epoxy. It can now be installed at $\frac{3}{8}$ inches (approximately 9.5 mm) or less. This helps the material blend with tile and other neighboring surfaces and makes construction much easier. The epoxies can be colored and formed into countless appearances much more efficiently, making it an option for company branding opportunities.

In addition to traditional marble scraps, companies have chosen to personalize their floor by adding recycled glass, branded colors and logos, stainless steel and even computer chips.

The resurgence of terrazzo in commercial facilities, specifically single-tenant buildings, is followed by an evolved maintenance strategy. New terrazzo does not yellow and is not as hard to maintain as it was in the past, but there are new challenges to be mindful of.

Muted terrazzo floors are trending, but muted floors don't always function as the design was envisioned. Muted coatings are difficult to install because they are thin by nature and they do not conceal imperfections. For example, every scratch, scuff mark and piece of dirt is visible under cross lighting. As layers of coatings are applied, the floor will start to lose a muted appearance and often looks dirty and requires more care.

Terrazzo is often installed in exterior applications. Because of its pure, flat nature, when it gets wet from rain, spills or sprinklers, the surface becomes slick. Options to add traction to terrazzo are possible, but not ideal. Similar to other textured floors, textured terrazzo can be difficult to clean and often appears dirty. Knowing where to install and how to care for these floors are key components to their success.

When caring for any type of terrazzo, there are many factors to take into consideration — environment, traffic patterns, usage and proper tools to name a few. There is a fine line between grinding, honing and polishing. While they may sound like the same process, there are important differences. It is common to see terrazzo cut through to the subfloor in high traffic areas due to poor "over" maintenance using improper tools and methods. The result is usually patching or replacing the damaged area. Patching and replacing terrazzo is never a good look because the color and finish rarely match and are highly visible.

Although most maintenance equipment and supplies are available to the public, a specialized craftsman understands the physics of the job and how to combine the right tools, frequency and methods for the best possible result. Do some due diligence when hiring a consultant or maintenance provider. Interview, check references and have them perform a test area to demonstrate their capabilities and expertise.

Dos

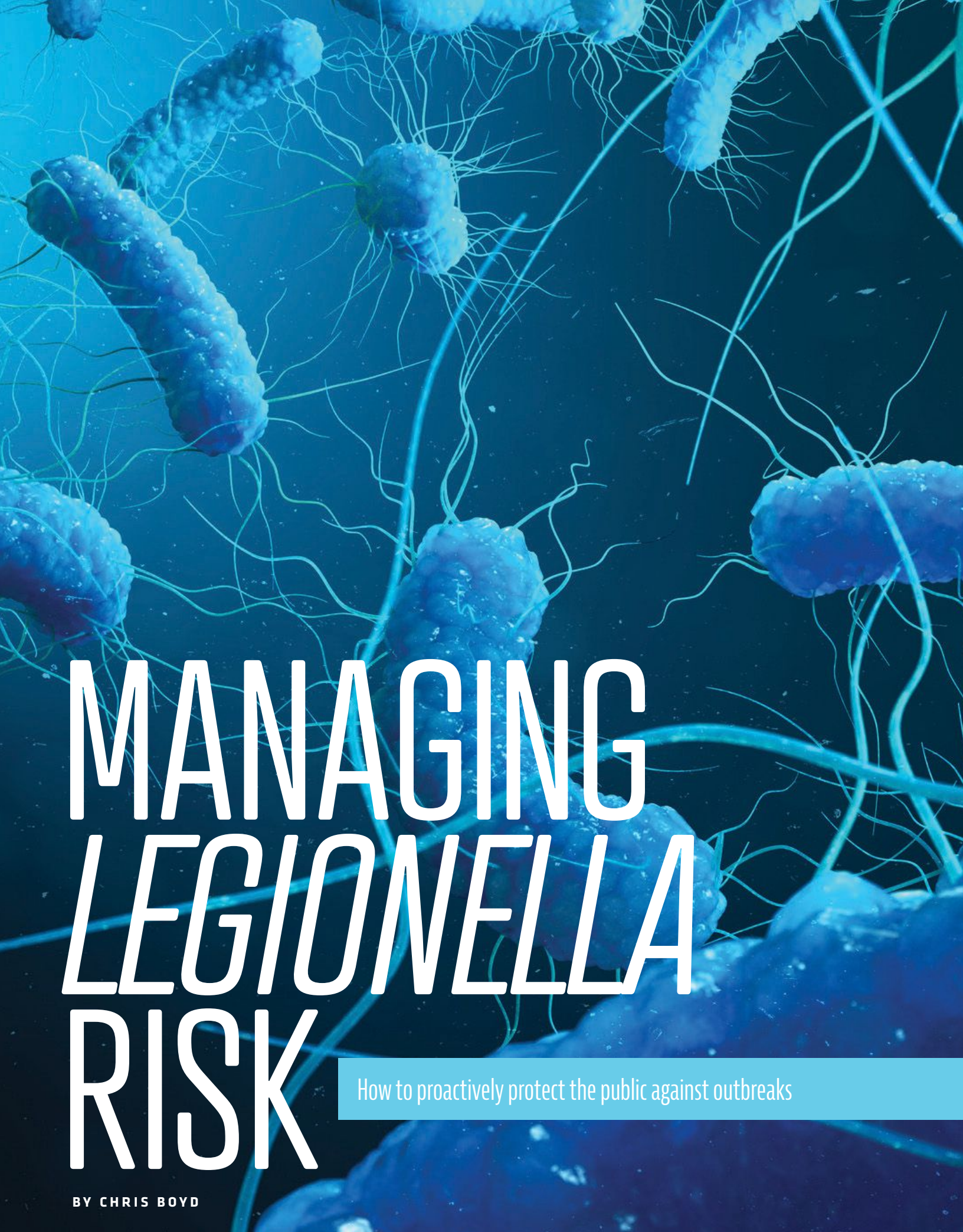
- ✓ *Work with a specialized maintenance provider to create a clear and proactive care plan for all surfaces*

Don'ts

- × *Delay having a maintenance plan or hiring a service provider until an issue is visible*
- × *Try to create a one-sized fits all approach for your surface care plan methods, chemistry or maintenance*

Dan Abitol, SOLID Surface Care, Inc. Director of Operations, has experience within the hospitality industry instilled an unwavering commitment to customer service and the ability to coach his operation's team to achieve greatness beyond their expectations. At SOLID, Dan has over two decades of soft and hard surface experience and continues to lead the industry in selecting world-class chemistries, equipment and designing processes that continually delight clients.

Phil Calabritto, SOLID Surface Care, Inc. Global Technical Director, is a third-generation craftsman with over four decades of experience. His passion for his craft and mentoring the next generation of hard surface care experts is contagious. He is driven to keep the art of restoration alive while being a pioneer in advancing hard surface maintenance technology and methodologies. As a contributor to safety and surface care initiatives at facilities organizations, Phil continues to be an influential leader at SOLID and in the industry.



MANAGING *LEGIONELLA* RISK

How to proactively protect the public against outbreaks

BY CHRIS BOYD

It seems like nearly daily we hear reports of new public health crises. One of the top public health risks is a *Legionella* outbreak at a hospital, hotel, long-term care facility or similar type of building. It is critical to understand *Legionella* outbreaks are not isolated incidences but reflect predictable patterns of failure in building water system management. In nearly all cases the outbreak could have been prevented had a properly implemented water management plan been in place. According to the World Health Organization (WHO), in Europe, Australia and the United States, there are about 10 to 15 cases detected per million population per year.

THE ORIGIN STORY

The first documented *Legionella* outbreak was at the 1976 American Legion convention in Philadelphia, Pennsylvania, USA, when 221 people attending fell ill and 34 died. Since then public health agencies have improved their surveillance and understanding of how people contract the disease. *Legionella* is a global public health concern, and the number of cases is rapidly on the rise.

A WHO *Legionella* fact sheet points out that the true rate of incidence worldwide is not known because many countries lack adequate diagnosis methods and surveillance systems. However, a U.S. Centers for Disease Control and Prevention (CDC) *Legionella* fact sheet says Legionnaires' disease is likely underdiagnosed. In the United States, the CDC reports that nearly 7,500 cases of Legionnaires' disease cases were documented in 2017, a nearly five-and-a-half-fold increase since 2000.

UNDERSTANDING RISK

The bacterium that causes Legionnaires' disease is found in the environment and only poses a danger to public health when it proliferates in the warm water found in building water systems. It is then spread through aerosolized water droplets and inhaled as mist.

These mists are created by cooling towers, decorative fountains, hot tubs, shower heads and other sources. Inhaled, the contaminated mist can result in Legionnaires' disease, a serious lung infection that causes pneumonia. Symptoms include cough, shortness of breath, high fever, muscle pains and headaches.

The elderly and those with suppressed immune systems are particularly at risk, and about 10 percent of people who get this infection will die, according to the CDC's June 2016 Vitalsigns report. In a health care setting, 25 percent of those infected will die, according to the CDC's June 2017 Vitalsigns report. No other waterborne illness in industrialized countries is associated with such a high rate of death.

COOLING TOWER OUTBREAKS

Cooling towers in building water HVAC systems generate the most risk and greatest potential liability. Roughly 60 percent of outbreak-related fatalities are attributed to cooling towers, according to a 2018 study, "Outbreaks of Legionnaires' Disease and Pontiac Fever 2006-2017," published in the journal *Current Environmental Health Reports*.

Cooling towers operate on the principal that water evaporation extracts heat from coils containing circulating water. Evaporation volatilizes the water droplets carrying *Legionella* bacteria and spreads the bacteria into the air as an inhalable aerosol.

Illnesses from *Legionella* have been documented as occurring even a mile away from the contamination source, according to a WHO *Legionella* fact sheet. Often located in dense urban areas, cooling towers provide a mechanism for widespread human exposure if *Legionella* risks are not controlled.

While there is no question that risks from cooling towers can be effectively managed, inconsistent management practices continue to be observed. These practices are largely driven by facility managers not requiring water treatment firms to manage their cooling tower systems in accordance with best practices. To help address inconsistent management practices, FMs should use detailed protocols to establish clear risk management expectations from the water treatment firms operating their cooling tower systems.

Poor maintenance of cooling towers is one of the biggest challenges for public health officials and building safety agencies. This is due to the absence of a unified, publicly accessible registry for cooling towers. A public registry of cooling towers could help health investigators pinpoint the source of an

Consider the following examples of large-scale outbreaks associated with cooling towers since 2000:

- » **2001, Murcia, Spain**
More than 800 suspected or confirmed cases
6 deaths
- » **2005, Toronto, Canada**
135 confirmed cases
23 deaths
- » **2012, Edinburgh, Scotland**
92 suspected or confirmed cases
3 deaths
- » **2014, Lisbon, Portugal**
377 confirmed cases
14 deaths
- » **2015, New York City**
138 confirmed cases
16 deaths

Preventing Legionnaires' Disease

Despite the diversity and complexity of the ecosystems within building water systems, it is possible to develop consistent risk management across a large portfolio. There are examples of enterprise solutions effectively managing risk in hospitality, health care, residential, commercial and industrial portfolios. What makes these enterprise solutions successful is the consistency with which the water safety plans are developed and implemented. Some key steps include:

- » **Identifying building water systems where Legionella control measures are needed**
- » **Assessing how much risk the hazardous conditions in those water systems pose**
- » **Applying control measures to reduce the hazardous conditions**
- » **Documenting that the program is running as designed and monitoring risk factors for the various systems**
- » **Writing protocols for how to respond when elevation of risk is identified**
- » **Validation sampling that confirms the program is successfully managing Legionella exposure risks**

outbreak as they look for commonalities among those infected with *Legionella*. It could also be a tool to develop strategies to monitor management practices at the building level.

By incorporating routine maintenance and management information into the registration system, building owners and public health agencies can respond to risk prior to outbreaks. In North America, the State of New York, New York City, the Province of Quebec (Canada) and the cities of Vancouver (Canada), Hamilton and Austin (USA) have each established cooling tower registration or maintenance requirements. More than 15 additional cities are currently engaged in discussions about establishing a standardized cooling tower registration.

REACTION TO PREVENTION

Legionella outbreaks can be consistently prevented through implementation of a properly designed water management plan, according to information published in the CDC's June 2016 Vital signs. That year's report also found that 9 out of 10 outbreaks could have been prevented.

Soon after this finding, the Centers for Medicare and Medicaid Services (CMS) in the United States directed all federally-funded health care facilities to implement water management plans to control *Legionella* and other waterborne pathogens.

Numerous jurisdictions around the world have established similar requirements for proactive management of cooling towers and other building water systems, according to a study titled "Overview and Comparison of *Legionella* Regulations Worldwide" published in the American Journal of Infection Control.

With scientific evidence that *Legionella* risks can be reliably and consistently controlled, civil and possible criminal liability questions arise. Years ago, it could have been argued that the relationship between engineered water systems and illness and death was neither known nor established. That argument cannot be made anymore.

Today we know *Legionella* is spread through contaminated aerosols in the form of mist or droplets. Further, we know cooling towers, decorative fountains and intermittently used showers are often the source. We know that if those systems are managed properly, risks of illness and death can be significantly reduced.

The safety of engineered water systems needs to be compared to boilers, escalators, elevators and other critical health and safety systems in buildings. These systems are mandated by well-established safety regulations because our society has a very low tolerance for engineered systems that have a potential to result in injury or even death. Facility managers must ask the critical question: Why shouldn't building water systems be regulated in the same way as other building safety requirements?

Some of the issues that generate risk are driven by other goals such as water conservation. If water flows are greatly reduced without consideration for water age, temperature loss, stagnation and loss of disinfectant to control biofilm growth, some conservation efforts may result in the creation of a deadly hazard. Water conservation efforts must align with management of *Legionella* risks.

Other risk factors include nearby construction which can dislodge biofilm and free *Legionella* into the water distribution system. Water main breaks can introduce dirt and debris into the water system, using up the residual disinfectant in the water and leaving less to fight pathogens. In addition, temperature settings or other factors that impact water temperatures can lead to increased risk. *Legionella* grows best between 77° and 108° Fahrenheit.

The Water Research Foundation has developed an educational campaign to inform building owners about the shared responsibility between water suppliers and building managers and owners to control *Legionella* risks.

Years ago, we would respond to cases, conduct building-level mitigation and then move on. But the time has come to realize this disease can be managed from a prevention standpoint.

The confirmation of 7,500 Legionnaires' disease cases last year in the United States is driving a hard look from state attorneys general, the insurance industry and plaintiffs' lawyers. They are not going to continue to accept "I didn't know" as a legitimate defense against risk and responsibility. FMI

REFERENCES

1. *Legionella* Conference 2019: www.legionellaconference.org
2. *Legionella* Regulations Worldwide: www.ncbi.nlm.nih.gov/pubmed/30638676
3. Toolkit: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings: www.cdc.gov/legionella/wmp/toolkit/index.html
4. Water Research Foundation Educational Campaign: www.waterrf.org/Pages/Projects.aspx?PID=4664
5. World Health Organization *Legionella* Fact Sheet: www.who.int/news-room/fact-sheets/detail/legionellosis



Chris Boyd is a former public health official for New York City who led the city's response to the 2015 Legionnaires' disease outbreak. He now serves as General Manager of Building Water Health at NSF International, a global public health organization based in Ann Arbor, Michigan, USA. NSF is partnering with the National Environmental Health Association to host the second annual *Legionella* Conference in Los Angeles.

The Fuel & The Space

Brighton, Michigan

General Contractor & Cost Estimator

D.J. Maltese Construction Corporation

In June of 2017, Ted and Kelli McMullen contacted D.J. Maltese Construction Corporation to discuss two new projects to be built-out in a mall in Green Oaks Township (Brighton), Michigan.

The project would house a “hot yoga” studio (a first in Michigan), and a juice café with no cooking equipment. After an initial meeting, we created a conceptual floor plan for both spaces, with a preliminary estimate and proposal.

The owners were intrigued with our understanding of the project and same day concept design, estimate and proposal. They signed our proposal and we moved forward to design the spaces.

Over the next few months, we worked with the city, the landlord, and the owners to complete the design and engineering, then applied for permits in late August. Upon securing the permits in September, construction started and was completed by mid November.

Two of the largest hurdles the project faced were the infrared inlay ceiling panels required to heat the hot yoga room and the soundproofing to keep the loud music contained within the room.

The infrared inlay ceiling panels were a new product for the local fire and building department, so it took time to get approval for their use – especially their installation around the code-required fire sprinklers.

Then there was the need to minimize the sound transmission of loud music during yoga sessions. We were able to successfully reduce the sound by using a special membrane, acoustical clips, double drywall and special glue. The project was brought in within budget and on time.

With the near completion of the “The Space” yoga studio, we moved on to the design of the “The Fuel” juice bar. The owners had originally requested an open ceiling, but the cost of the HVAC for the open ceiling was excessive. Instead, we created several ceiling levels with black tile and a floating cloud ceiling to present the illusion of an open ceiling and provide a more reasonable HVAC cost.

With permit secured, construction started in October and continued until an early December finish. Special features for “The Fuel” juice bar included a polished concrete floor, clear resin-coated raw-edge wood counters and



“The Fuel” juice bar and “The Space” hot yoga studio representing a new age injection to the rust belt.

tables, stainless-steel work counters and commercial blenders for smoothies. Again, the project was brought in on time and within budget.



The bar at The “Fuel” with its imaginative cloud ceiling - ready for juicing up customer’s request.

Photos Courtesy of Andrew Maltese

General Contractor & Cost Estimator

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www.djmaltese.com

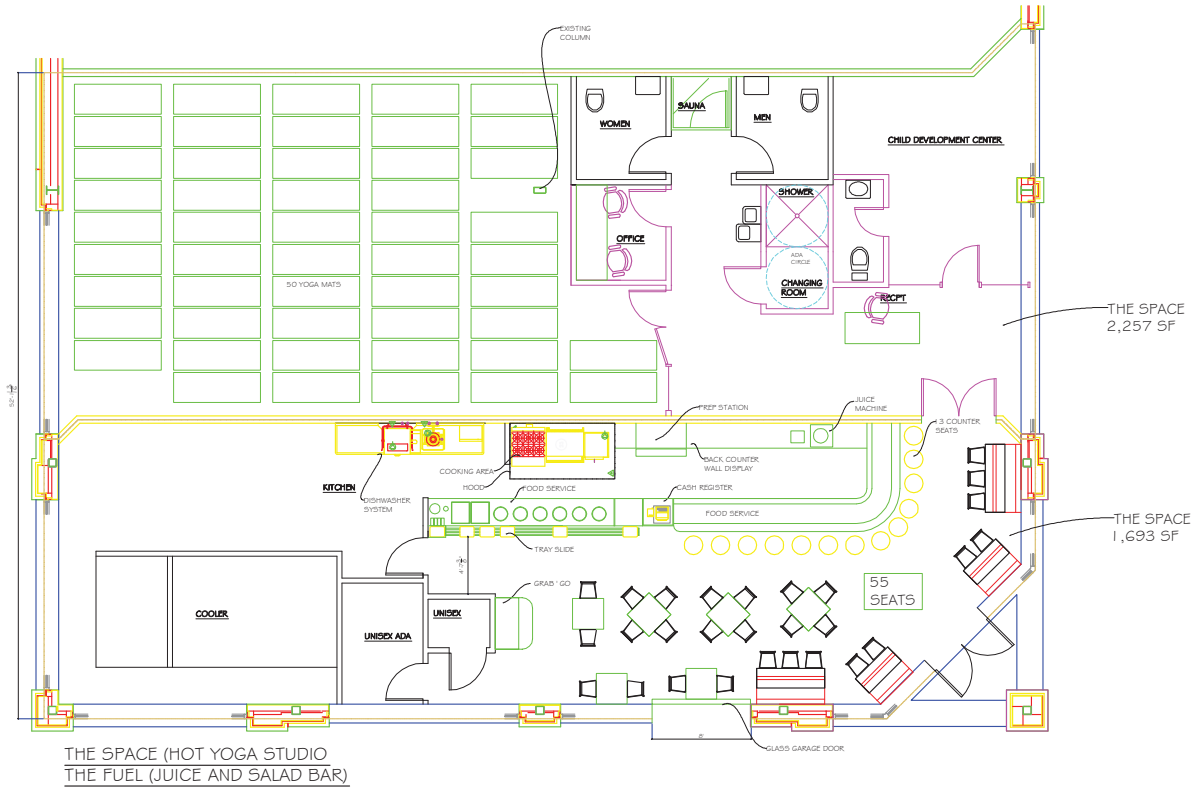
Project Team

Architect, Mechanical & Electrical Engineer

Steven C. Flum, AIA, Inc.
 3105 Holbrook Street, Hamtramck, MI 48212

Project General Description

Location: Brighton, Michigan
Date Bid: Aug 2017
Construction Period: Sep 2017 to Dec 2017
Total Square Feet: 3,900 **Number of Buildings:** One.
Building Sizes: First floor, 3,900; total, 3,900 square feet.
Building Height: First floor, 14'; total, 14'.
Basic Construction Type: Tenant Build Out.
Floors: Concrete. **Interior Walls:** Metal stud drywall.



DIVISION	COST	% OF COST	SQ.FT. COST	SPECIFICATIONS
PROCUREMENT & CONTRACTING REQUIREMENTS	1,500	0.33	0.38	—
GENERAL REQUIREMENTS	3,800	0.84	0.97	—
CONCRETE	1,420	0.31	0.36	Cast-in-place.
WOOD, PLASTICS & COMPOSITES	101,156	22.26	25.94	Rough carpentry, finish carpentry, architectural woodwork.
OPENINGS	17,899	3.94	4.59	Doors & frames, entrances, storefronts & curtain wall.
FINISHES	99,439	21.89	25.50	Acoustic treatment, plaster & gypsum board, ceilings, flooring, wall finishes.
FIRE SUPPRESSION	30,617	6.74	7.85	Fire extinguishing systems.
PLUMBING	25,880	5.70	6.64	Fixtures, equipment.
HVAC	77,256	17.00	19.81	Air distribution, infrared heaters.
ELECTRICAL	55,460	12.21	14.22	Low-voltage transmission, lighting, fixtures.
COMMUNICATIONS	39,911	8.78	10.24	Audio video.
TOTAL BUILDING COSTS	454,338	100%	\$116.50	
TOTAL PROJECT COST	454,338			

UPDATED ESTIMATE TO APRIL 2019: \$123.23 PER SQUARE FOOT

Regional Cost Trends
 This project, updated to April 2019 in the selected cities of the United States.

EASTERN U.S.	Sq.Ft. Cost	Total Cost	CENTRAL U.S.	Sq.Ft. Cost	Total Cost	WESTERN U.S.	Sq.Ft. Cost	Total Cost
Atlanta, GA	\$100.33	\$391,281	Dallas, TX	\$97.06	\$378,522	Los Angeles, CA	\$506.25	\$8,700,432
Pittsburgh, PA	\$126.50	\$493,355	Kansas City, KS	\$130.86	\$510,367	Las Vegas, NV	\$463.71	\$7,969,303
New York, NY	\$161.40	\$629,453	Chicago, IL	\$136.32	\$531,632	Seattle, WA	\$506.25	\$8,700,432

For more information on this project and similar projects visit www.dcd.com

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