

FMJ



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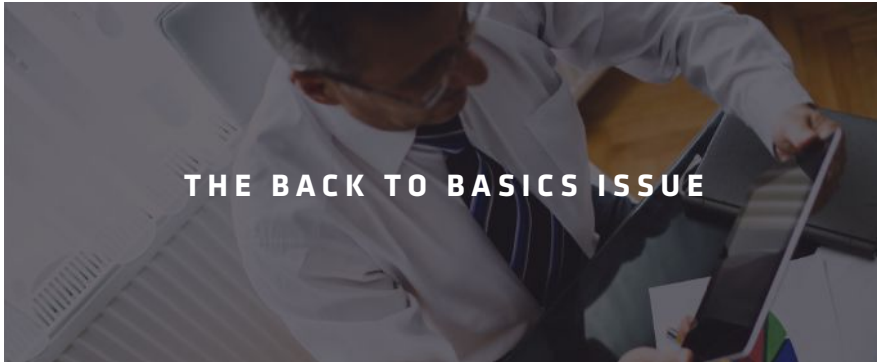
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ABOUT IFMA IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in more than 100 countries. This diverse membership participates in focused component groups 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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*According to the IFMA sponsored research report, "Evaluating the Value: International Facility Management Association (IFMA) Facility Management Credentials"

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Online

ON THE GO?

FMJ can be viewed on your mobile device, so you can get your FM content fix anywhere, anytime.

FMJ Extras

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.

025 Article

6 Reasons Why Your Organization Needs a Digital Accessibility Policy

www.essentialaccessibility.com/blog/digital-accessibility-policy

035 Book

The Fourth Industrial Revolution, by Klaus Schwab

www.weforum.org/pages/the-fourth-industrial-revolution-by-klaus-schwab

042 Video

5 Trends Coming to Work in 2019 (requires IFMA membership)

http://community.ifma.org/knowledge_library/m/premium_content/1058095

048 Video

Self-healing Concrete

<https://youtu.be/J5B8MMxKPjI>

FMJ Extended

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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Contributed by IFMA's Facility Management Consultants Council

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074 American Cities Climate Challenge

How cities are leading the charge to create a sustainable future

Hilary Firestone

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080 Vendor Profiles

FROM LAST ISSUE

The January/February 2019 issue of FMJ had a theme of The How-to Issue. Our most-read article was "Navigating the China Recycling Ban" by Matthew Hollis. Find out how FMs are auditing their waste and creating new recycling plans at http://bit.ly/0119_recycling.



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Editor's Note Jocelyn Kerr

One of my favorite things about March is watching the team here at the Service Center of Excellence get everything ready for our spring events: World Workplace Europe, World Workplace Asia and Facility Fusion U.S.

As a two-year alum of our flagship conference, World Workplace, I know how much effort goes into the pre-show planning. From booking cutting-edge technology sessions to facilitating opportunities for networking, the crew here at SCOE spends months preparing for these events. It's always exciting for me to hear from members about their experiences as attendees.

If you've been to World Workplace in October, but you haven't yet attended a spring conference, consider making a trip next year. You'll find website addresses for this year's events listed on page 13. If you do attend this spring, let us know your thoughts! The best part about an event is connecting with you in person.

As industry awareness grows through events, chapter leadership and even the newly released ISO standard, students and young professionals are getting more involved. As we all know, the forecasted labor shortage has been a hot topic for several years now. On page 42, you'll read some of the ways chapters, sponsors and the IFMA Foundation are bringing students and organizations together at events to make meaningful connections.

But, once connected, how are new FM's learning the ropes? This is our "Back to Basics O&M" issue, so we're taking a step back to cover a few of the basics. Starting on page 20, you'll find a primer on common FM acronyms. If you're not new to the profession yourself, it's a great overview to share with students and new professionals you're mentoring. And since this is an O&M issue, do you know how to own your O&M budget? A budget breakdown and tips are available on page 30.

The Internet of Things gets a lot of buzz in the built environment, but how often do we hear about the IoT of cleaning? On page 54, you'll read how smart technology is being used to transform facility cleaning services and how you can take advantage of these advances in your spaces.

Technology isn't limited to zeros and ones, though. We have an article on page 48 explaining how living organisms are being used to create self-healing concrete. The authors calculated the hypothetical savings of using self-healing products on potholes in a city the size of Chicago and the numbers were remarkable. Of course, there are plenty of smaller applications – from parking garages to private roads within a campus – where FM's could realize savings by exploring a technology like this.

Whether it's in the pages of this magazine or at one of our annual events, our goal is to provide you with the knowledge and tools you need to succeed in FM. And, as always, if you'd like to contribute an article or if you have member news to share, please reach out to me. Safe travels!

Interested in writing for FMJ?

Email jocelyn.kerr@ifma.org article ideas to be considered for future issues of FMJ.

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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*

My year as chair is flying by as we continue to bring some outstanding training, programs and events to our members and the industry.

Back to basics

This edition of FMJ is focused on bringing us “back to basics,” which is something I’m passionate about. Organizations often over-complicate things and lose sight of what they are trying to achieve. When this happens, we need to step back from the day-to-day and look at what we’re doing and why we’re doing it. We should evaluate the benefits and explore alternative ways to accomplishing our goals more efficiently and effectively. We must evaluate the impact and application of technology and consider sustainable solutions to our existing operations. IFMA has also applied the back-to-basics approach to our operations, and I’m pleased to report that our mid-year results are the best on record in years. The staff is fully engaged and we’re seeing positive trends in all key areas: Membership, Events and Training and development.

Looking ahead

Over the last eight months, we’ve met with the leadership of several top associations to help us frame best practices as we search for the new IFMA CEO. With our strategy confirmed and operations in good order, we’re moving forward. The CEO Search Committee – which consists of me, our global board First Vice Chair, Second Vice Chair and Past Chair, as well as two IFMA Fellows – has formally commenced the process of recruiting the right person to join us and lead our world-class team to deliver our long-term strategy. I’m looking forward to World Workplace Europe Meets Facility for Future this month in Amsterdam. Facility Management Netherlands has been a fantastic partner on this event, which has a great lineup of speakers and has generated the most buzz in the conference’s history. This year’s World Workplace Asia, a collaboration

between the Singapore Building and Construction Authority and our local IFMA chapter, takes place a few weeks after the European conference.

I’d like to thank our Atlanta Chapter for their contributions to and guidance on Facility Fusion 2019, happening in April. IFMA needs to continually engage our stakeholders, listen and learn. Our chapters, communities and councils are amazing and truly set IFMA apart. That’s why Facility Fusion is leadership focused – so we can offer training and support for existing and future component leaders, but also to promote two-way dialog that allows us to benefit from your valuable insights in shaping IFMA’s future.

Advancing FM training and recognition

The recently launched FM Training and Development Framework continues to demonstrate why we are the leading association for the FM profession. We’re working closely with a targeted group of associations representing specializations within the FM discipline to add their education resources to the framework and advocate for its use with governments and organizations around the world.

We entered into a Strategic Partnership Agreement with the Macau Institute of Management (MIM) at the end of February. MIM has agreed to adopt IFMA’s training framework and credential programs and will assist in developing new chapters in the region.

We also launched a new benefit for credential holders: digital badges. Beginning with CFMs and RCFMs in February and rolled out for FMPs and SFPs earlier this month, digital badges are a new way for credential holders to prove the validity of our designations and gain recognition for our accomplishments and related skills.

Thank you for your continued support. Wishing you and your families all the best as many around the world celebrate Easter festivities.



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DIGITAL BADGING: THE NEXT EVOLUTION IN FM PROFESSIONAL DEVELOPMENT



IFMA has unveiled a new enhancement for our world-class suite of FM credentials with the introduction of digital badges. The rollout of these web-enabled, shareable and verifiable versions of professional development accomplishments began in February with the Certified Facility Manager® (CFM®) and Retired CFM® (RCFM®), followed by the Facility Management Professional™ (FMP®) and Sustainability Facility Professional® (SFP®) in March. We've partnered with Credly, a top digital badging company, to provide this service through their platform, Acclaim.

This added benefit, provided at no additional cost to facility professionals who have earned their IFMA credentials, works by providing a graphic badge for use on social media, websites or email signature lines. The graphic links to a web page that not only verifies the authenticity and date of the accomplishment, but details the knowledge, skills and requirements behind it.

Research has demonstrated a remarkable 15 to 1 return on investment for FM professionals who earn an IFMA credential, and 70 percent of organizations rate IFMA credentialed employees as having statistically significantly higher performance. The average measured increase in performance for FM professionals with an IFMA credential is 40 percent.

We're rolling out the badging program throughout early 2019, beginning with FM professionals who have earned their IFMA credentials. We'll release additional badges, such as those for graduates of accredited FM degree programs, in coming months.

To learn more about digital credential badges, visit ifma.org/digital-credential-badges

IFMA supports Canadian conference for healthy buildings

As part of IFMA's critical goal of unifying the global built environment industry, we've joined forces with ISSA, the worldwide cleaning association, and MediaEdge Communications, one of Canada's largest B2B media and event producers, to support a new trade show and conference for professionals invested in maintaining cleaner, greener facilities. ISSA Show Canada will debut at the Metro Toronto Convention Centre June 11-13, 2019, held in tandem with the REMI Show whose delegates include building owners and managers.

Responding to evolving needs for regulatory compliance and emerging trends related to occupant well-being, the event will provide informed insight on best practices, certification, training and other emerging topics in the Canadian FM and cleaning markets. The program will include a full slate of educational seminars and exhibitions geared toward achieving healthier and more sustainable buildings.

Learn more at issashowcanada.com



A day of celebration and recognition for the FM profession

On May 15, facility professionals the world over will engage individuals, companies, associations and partners in celebrating the successes and contributions of FM to business and the built environment.

World FM Day celebrates the industry's vital role in keeping our facilities healthy, safe and productive. We encourage activities throughout the week (May 13-17) to recognize the profession and the people who practice it. Whether you choose to hold a seminar, host an office lunch, create a video, facilitate a social media chat or a client networking event, World FM Day is your opportunity to bring the important work you do into the limelight.

In addition to offering free content each day of World FM Week, IFMA will announce other events and resources via social media. Watch for updates on Facebook, Twitter and ifma.org.

How do you plan to celebrate World FM Day? Pin your local event to Global FM's map of activities held around the world.

Join the conversation online using hashtag #IFMAWorldFMDay.

Access resources at bit.ly/worldfmday2019

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

UPCOMING EVENTS



World Workplace Europe 2019 Conference & Expo

March 20-22
Amsterdam, Netherlands
worldworkplaceeurope.ifma.org



World Workplace Asia 2019 Conference & Expo

April 3-5
Singapore
worldworkplace.ifma.org/asia



Facility Fusion U.S. 2019 Conference & Expo

April 8-10
Atlanta, Georgia, USA
facilityfusion.ifma.org



World FM Day 2019

May 15, 2019
bit.ly/worldfmday19



ISSA Show Canada

June 11-13
Toronto, Ontario, Canada
issashowcanada.org



World Workplace 2019 Conference & Expo

Oct. 16-18
Phoenix, Arizona, USA
worldworkplace.ifma.org

Benchmark report provides data on practices and tools for managing facility services quality

In January, IFMA released the 2018 Operations and Maintenance: Qualitative Analysis Benchmarking Report, a comprehensive analysis of the most recent operations and maintenance benchmarking survey of more than 2,000 individual responses representing 98,000 buildings in 35 industries. Of unique interest in this report is a section exploring FM strategies for organizational agility and change management.

FM professionals can use the report to conduct a variety of analyses to determine competitive performance standing and identify best practices in operations and maintenance. It includes data-based insights from the United States and Canada that can translate into operational guidelines for:

- » Solid waste diversion
- » Legislative mandates
- » Energy management
- » Green janitorial training and programs
- » Maintenance management
- » Planning
- » Work requests and device usage
- » Satisfaction with and perception of information technology services
- » Benchmarking plans
- » Customer satisfaction survey use and frequency
- » Organizational agility

To order the report, visit bit.ly/ombenchmarks18 (US\$205 for IFMA members; US\$325 for nonmembers).

IFMA GROWTH SPANS COUNTRIES, INDUSTRIES

Just months after the creation of an IFMA chapter in the United Kingdom, IFMA's global board of directors approved petitions to form new chapters in France and Croatia, bringing the total chapter count in Europe to 12.

IFMA's Religious Facilities Council changed its name to better reflect the scope of its constituency. The Nonprofit Facilities Council recognizes professionals that the council has served for years, including FMs managing buildings for faith-based as well as secular charitable and community institutions.

The former Health Care Institute has been fully restored to council status as the Health Care Council. IFMA members who were a part of the institute will experience uninterrupted service and will benefit from a refreshed brand while returning to a more unified identity.

Industry News

NEW GLOBAL ALLIANCE COMMITTS UP TO US\$1.5 BILLION TO HELP END PLASTIC WASTE IN THE ENVIRONMENT

An alliance of companies that make, use, sell, process, collect and recycle plastics recently launched a new organization to advance solutions for eliminating plastic waste in the environment, especially in the ocean. Comprised of nearly 30 member companies located throughout North and South America, Europe, Asia, Southeast Asia, Africa and the Middle East, the Alliance to End Plastic Waste has committed to investing up to US\$1.5 billion over five years toward infrastructure, education, engagement, innovation and clean-up efforts.

In February, several Alliance members gathered in Washington, D.C., with U.S. Senators Dan Sullivan (R-AK) and Sheldon Whitehouse (D-RI), co-sponsors of the Save Our Seas act, to discuss how the Alliance will use its collective resources to drive solutions to the global challenge of plastic waste.

The Alliance will develop and bring to scale solutions to minimize and manage plastic waste and promote solutions for used plastics. Among its initial set of projects is partnering with cities to design integrated waste management systems. This work will include engaging local governments and stakeholders and generating economically sustainable and replicable models that can be applied across multiple cities and regions.

In the months ahead, the Alliance will drive progress in four key areas, one of which is infrastructure development to collect and manage waste and increase recycling.

For more information, visit endplasticwaste.org

Las Vegas, Nevada, USA, pilots smart lighting solution

Modern media company AT&T and smart city platform Ubicquia® are working with the city of Las Vegas to pilot a smart lighting solution in highly populated areas of the city's Innovation District. The solution uses the city's existing streetlight infrastructure to help improve public safety conditions for businesses, residents and visitors. It will also help reduce energy usage and improve operational efficiencies for the community.

As part of the six-month pilot, AT&T will replace existing photocells with streetlight routers to create a smart lighting network in select locations. AT&T will integrate their highly secure wireless LTE and LTE-M networks with Ubicquia's smart lighting platform to improve lighting conditions based on schedules and traffic.

In near real time, the platform can monitor energy usage and outages to improve streetlight maintenance – this will help reduce public safety concerns with prolonged or unreported light outages in areas of the community frequented by citizens and tourists. The platform will also connect to air quality sensors in selected areas to help provide near real time information on changes in temperature, ozone and particulate levels based on time of day, traffic and construction.

UAE FM market to reach US\$23,882.3 million by 2024

According to a market research report published by P&S Intelligence, the United Arab Emirates (UAE) facility management market is expected to witness a compound annual growth rate of 9.8 percent from 2019 through 2024.


The growing application of facility management in commercial buildings, residential construction projects, infrastructure projects and industrial projects, as well as increasing demand for property services are driving growth of the FM market in the UAE. The commercial sector is the largest end user, owing to the increase in awareness to optimize expenditure on commercial building management.

The FM industry in the UAE is considered one of the most flourishing industries in recent times, attributed to the increase in construction activities and growing tourism. Investment in the country's infrastructure and real estate sector is gaining momentum due to the upcoming Dubai expo 2020.

“All Things IoT” eBook on future of connected infrastructure

To read the new *Connected Infrastructure* eBook, go to mouser.com/empowering-innovation/All-Things-IoT

In January, Mouser Electronics Inc. released a new eBook centered on industrial automation as part of “All Things IoT,” the latest series in Mouser's award-winning Empowering Innovation Together™ program. The third and final publication in the series explores the innovative technologies and trends that cities are applying to emerging smart infrastructure projects. The new eBook investigates the sometimes-unnoticed parts of our world where the Internet of Things can make a major difference, such as lighting, traffic and green energy. It includes articles on LEDs and light fidelity (Li-Fi) lighting systems, threat modeling and IoT-based pollution control. Readers can also view a video of Mouser spokesperson Grant Imahara (“Mythbusters,” “Battle Bots”) to learn about a company in Porto, Portugal, that is transforming the city into a Wi-Fi mesh network comprised of mobile hot spots.



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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Creating a Knowledge Management Strategy

BY LAVERNE DECKERT AND CASEY MARTIN

In April, *ISO 41001 Facility management – Management systems – Requirements with guidance for use* will celebrate its first birthday. There has been a lot of interest in this standard, and organizations around the world have been offering training to help facility managers familiarize themselves with the standard and the benefits to a management system for facility management (FM). For this article, we want to take a deeper dive into one subclause of ISO 41001, subclause 7.6, Organizational knowledge.

The turn of the century, armed with internet search engines, social media and immediate answers to questions we didn't even know to ask, has opened the door for information tidal waves. Unfortunately, the deluge of unvetted information and the aging workforce are significantly impacting the current state of organizational knowledge for the FM world. For example, this year every Baby Boomer will be 55 years or older, and more than 50 percent of FM practitioners will be retiring in the next five to 15 years (IFMA Foundation). For the sixth consecutive year, skilled trade positions are the hardest to fill globally (Manpower Group 2018 United States talent shortage survey), and only one percent of college students think they will enter a career in facility management (JLL). All of these facts strengthen the trending need for prioritizing organizational knowledge for the successful continuation of FM organizations.

Considering 90 percent of the world's data has been created in the last two years,

and the pace is not slowing, the FM industry is facing a data-rich and knowledge-poor condition without an intentional plan to capture, store, transfer and disseminate knowledge within the organization.

This closed loop cycle perpetuates a learning organization that can adapt and respond to industry changes. While the competencies, knowledge and skills facility managers need have been defined

at high level by the International Facility Management Association's Global Job Task Analysis and the Federal Buildings Personal Training Act (FBPTA) as well as several college and university programs around the world, it is unlikely that many FM organizations have an established and documented knowledge management (KM) strategy to preserve and transfer their organizational knowledge. Organizations rely on the experience of their workforce — experienced facility managers whose knowledge is largely tacit and for whom the documentation of that knowledge is a priority far behind the fires of the day.

Sub clause 7.6 states that “the organization shall determine the knowledge necessary for the operation of its processes and to achieve conformity of products and services.” It was important for the contributors of the standard that this clause was included in the management system standard as a measure of addressing business continuity and managing risk.

“You can never extract and transfer all the deep smarts that an expert has accumulated, but it's important to identify what needs to be captured before it walks out the door,” according to HBR. “In-depth succession planning, knowledge-sharing programs, even just questioning the experts before they leave the organization are imperative steps to ensure that your organization's deep smarts stay within the walls of your organization.”

Sub clause 7.6 was included in ISO 41001

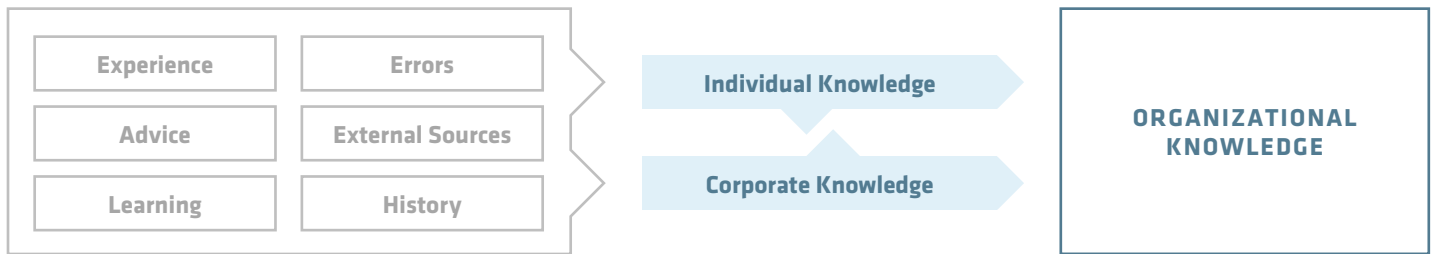
Harvard Business Review (HBR) describes four costs as a result of the loss critical knowledge:

Relationships – ability of a seasoned professional to reach out to a network and get an immediate response to solve a problem

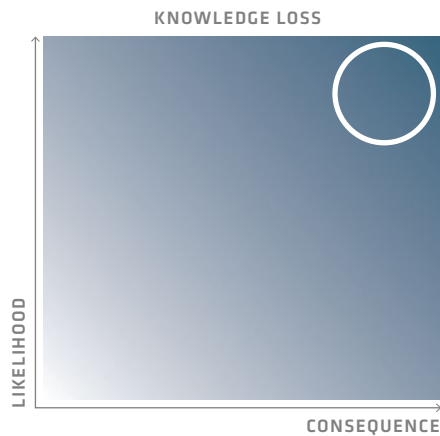
Reputations – the blow to an organization when it no longer has the expected level of experience and skills

Re-work – the onboarding time of new employees who have to relearn critical processes or undocumented ways of working or when new solutions do not work because of lack of understanding of business practices by new employees

Regeneration – the capability to bring out the next new product



to address these and other issues associated with the lack of knowledge transfer. The guidance provided in ISO 41001 further states “organizations rely on the knowledge and experience of their personnel to execute their operational plans. [Knowledge management] is therefore necessary for a robust management system to be capable of delivering consistent conforming outputs that such knowledge is captured and is retrievable. Such knowledge may be used during planned or unplanned change or for innovation and service development. Systems should be in place to prevent loss of such knowledge due to personnel leaving the organization’s employment, becoming demotivated, or becoming ill.” (ISO 41001, A.7.6)



The organizational knowledge chart illustrates a simple knowledge management framework for building organizational knowledge. Embedment of this framework into a continuous capture and transfer loop is essential for building knowledge content and maintaining relevant and timely applicability.

If an organization does not already have a formal knowledge management strategy, there are four steps to begin the journey.

First connect KM strategy to business strategy by asking what knowledge is neces-

sary to achieve the demand organization’s core business objectives.

Second, identify critical knowledge by assessing the likelihood of knowledge that may be lost, as well as the consequence associated to the knowledge loss.

Third, determine how knowledge is currently shared in the organization and build from that framework.

Fourth, build a business case for knowledge management with a clear value proposition for why it is important to the FM organization.

A knowledge management plan, like any other part of the ISO management system standard, requires continuous monitoring, realigning, and improving. If the organization already has a formal knowledge management strategy, consider organizational changes — such as changes in business strategies or priorities, culture or business processes, and business applications or tools (including new technology) — as a call to review and renew that strategy.

If it is not clear whether the organization truly needs a knowledge management strategy and capture plan, then ask yourself what the potential impacts of not being prepared may entail. Begin to quantify the time wasted and opportunities lost as the knowledge resources retire and skilled trades become scarcer with each passing year. Consider what happens to the FM organization if a knowledge management program simply isn’t there. This is especially true as the external environment imposes a world of changing conditions, an aging workforce and technological advancements.

Implementing a knowledge management plan in advance of known business impacts, such as an impending retirement bubble, can improve the organization’s decision-making speed, ability to deliver, the speed of new employee ramp-up, employee retention and organizational adaptability. **FMJ**

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Casey Martin is Co-Chair of the U.S. Technical Advisory Group to ISO/TC 267 developing the new standards family for Facility Management. She specializes in asset management services within the Buildings & Infrastructure Consultancy at Jacobs Engineering. In this role, she consults with private and U.S. federal institutions, providing full life cycle perspectives throughout project development stages. Her approach considers important long-term views such as total cost of ownership, reliability-centered maintenance practices, operations strategies, and processes and policies to align asset management with business mission and objectives.



Laverne Deckert is an independent consultant who provides on-site and off-site strategic business consultation, team facilitation, project development, briefs and management, process, operations and communications support, including special project initiatives, and project overhauls. She is a member of the U.S. Technical Advisory Group for ISO/TC 267 and served as administrator to this group from June of 2012 to July 2017.

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Monday, April 8

	International Salon 1-2	International 3	International 4	International 5	International Salon 7-8	International Salon 9-10	International 6	M301
	IFMA Components Leadership	Leadership Development	Operations & Maintenance	Sustainability	Technology	Workplace Evolutionaries	FM Solutions	REAL Community
9:00 am - 10:00 am	1.01	1.02	1.03	1.04	1.05	1.06	1.07	1.08
	Opening Power Speaker 1.0 - "It's Showtime! Leading High-Performance Teams in a High-Pressure World" Presented by Bill Stainton							
10:15 am - 11:45 am	2.01 Networking Evolution: Building Stronger Relationships and Connections Presented by Lowell Aplebaum, CAE, CEO & Strategy Catalyst, Vista Cova	2.02 Leveraging Your Company's Collective Intelligence to Accelerate Innovation Presented by Rod Collins	2.03 Complexities of Large Property Losses Panel Discussion Presented by Sherrie Boylan	2.04 Recycling: The Right Thing To Do - Developing and Implementing a Workplace Plan Presented by Joe Pearson	2.05 Leveraging Technology to Communicate Effectively within the Changing Dynamics of a Multi-Generational Workforce Presented by Geoff Williams; Ted Ritter	2.06 A) 10:15 am - 10:45 am Space Matters - Space as a Tool to Better Performance in Organizations (Data, Evidence & Future Trends), Presented by: Gitte Anderson B) 10:45 am - 11:15 am "Agile" Working - Embracing the Evolution of a Changing Workplace. Presented by Andrea Sarate C) 11:15 am - 11:45 am FM Role in Building Community at Work. Presented by Lisa Whitehead	TBA	2.08 FM in the Post-Carbon Economy Presented by James Ware
12:00 pm - 1:30 pm	3.01	3.02	3.03	3.04	3.05	3.06	3.07	3.08
	Power Speaker Lunch 3.0 - "Where Next, Technology?" Presented by Bob Schukai							
2:00 pm - 3:00 pm	4.01 Member Retention: Creating the Member Experience Presented by Lowell Aplebaum, CAE, CEO & Strategy Catalyst, Vista Cova	4.02 The Leadership Dilemma: How to Unlock the Potential of the 4-Generation Workplace Presented by Kelly and Robby Riggs	4.03 The Future of the Built Environment: Office Acoustics Presented by Ioana Pieleanu	4.04 MISSION POSSIBLE: FM "Flight Deck" for Energy Usage Presented by Peter Stroup	4.05 Reengineering FM/RE in the Age of the Smart Machine Presented by Nancy Sanquist; Alexander Redlein; Pat Turnbull	4.06 A) 2:00 pm - 2:30 pm Another Study Decrying the Open Office: So Many Studies, So Little Understanding. Presented by Arnold Levin and Alexis Kim B) TBA	TBA	4.08



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IFMA Components Leadership	Leadership Development	Operations & Maintenance	Sustainability	Technology	Workplace Evolutionaries	FM Solutions	REAL Community

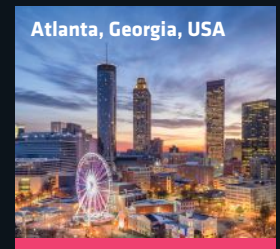
Tuesday, April 9

8:00 am - 9:00 am	5.01	5.02	5.03	5.04	5.05	5.06	5.07	5.08
		Survival Triggers: The Hidden Reason Why Leaders Say and Do Stupid Things Presented by Carlann Ferguson	Oregon Convention Center's OCx Program: Integrating Functional Testing with Preventive Maintenance Presented by Ted Spear; Mark Effinger; Josh Lipscomb	Who's Afraid of Zero Waste? Presented by Anna Dengler	How to Build a Bridge with Technology and Facilities Presented by Erika Voss	Workplace Evolution: Beyond Open Plan, Presented by Betsy Nurse and Danielle Schmitt	TBA	Creating the High-Performance Workplace: A Conversation with Sue Bingham Presented by James Ware and Susan Bingham
12:00 pm - 1:30 pm	Power Speaker Lunch 6.0 - "Leading From Any Seat: Stories from the Cockpit & Lessons from the Grit Project" Presented by Shannon Huffman Polson							
1:45 pm - 2:45 pm	7.01	7.02	7.03	7.04	7.05	7.06	7.07	7.08
Part 1: IFMA Volunteer Leader Roundtables		It takes more than talking to be a leader. Communications strategies to help us all. Presented by Alana Dunoff and Leslie Groff	Building Quality Assessment Presented by Stephen Ballesty	WELL Building Standard: Harnessing Buildings as Vehicles to Support Human Health and Well-Being Presented by Bonnie Hagen	Best Practices on Cyber Security & Data Privacy from the Facility Manager's Guide for Information Technology Presented by Ted Ritter; Geoff Williams; Simon Davis	WE Ideation Workshop	TBA	Real Estate - What's Hot and What's Not: Adding Value through Markets and Trends Presented by Janice Cimbalo
3:00 pm - 4:00 pm	8.01	8.02	8.03	8.04	8.05	8.06	8.07	8.08
Part 2: IFMA Volunteer Leader Roundtables		It takes more than talking to be a leader. Communications strategies to help us all. Presented by Alana Dunoff and Leslie Groff	How a Fortune 25 Company is Reinventing Space for Agile Work: An Express Scripts Case Study Presented by Julie Keil	It's Not Rocket Science - How to Achieve an Immediate ROI for Efficiency Improvement Projects with the PACE Program Presented by Scott Ringlein	Is your service program keeping up with the times? Presented by David Auton	WE Ideation Workshop, continued	TBA	Real Estate: What Keeps You Up at Night? Presented by Janice Cimbalo and James Ware

Wednesday, April 10

8:00 am - 9:30 am	9.01	9.02	9.03	9.04	9.05	9.06
	Power Speaker Breakfast 9.0 - "Building Your Cyber Toolbox" Presented by Michael Daniel					
9:45 am - 10:45 am	10.01	10.02	10.03	10.04	10.05	10.06
Millennials in the FM Workplace: The Benefits, Challenges and HR Pitfalls, Panel Discussion Moderated by Geoff Williams and Nick Heibein		Who Will Take the Lead? How FMs Are Uniquely Qualified to Drive ROI through Workplace Innovation Presented by Mike Petrusky	How I survived (and thrived) with phased moves of 5000 staff in an occupied building - Really Presented by Donald Eischens	Overcoming the Tenant Landlord Barriers to Improving Facility Efficiency Presented by Maureen Kiely	The Future of Technology in Facilities Management: Today's Differentiators are Tomorrow's Best Practices Presented by Deb Noller	Mini Case Study Sessions
11:00 am - 12:00 pm	11.01	11.02	11.03	11.04	11.05	11.06
		The Value of Strategic Decision Making Presented by Allan Donnelly	Employing Supplier Diversity Strategies to Attract the Right Attention Presented by Bill Miller; Irene Thomas-Johnson	Sustaining Facilities for the Next Century: Smarter solutions for Safer Water and Energy Transmission and Distribution Presented by Cameron Manners	Purchasing Technology is not like Purchasing an HVAC System Presented by Jake Young	Panel Discussion by Case Study presenters

Atlanta, Georgia, USA



T H E H V X I
Q A W V U B O
M Y B A C R O
N Y M I C P E
R D Z L E I G
K W O R L D K
P V E I X H Q
L O F Y F M S
T G C E T J X
O K R H V W M

What's in a name? That which we call "facility management" by any other name would function the same. However, an operational definition is helpful when defining a concept. For instance, the word "plane" has a different meaning to someone in aeronautics versus a carpenter or a mathematician. The context in which a name is used is important in defining the terminology, and facility managers must have familiarity with the profession's frequently used terms in their proper context.

Facility management **FM** contains a world of acronyms, and when one enters this world, understanding connotation is imperative. In a sense, names don't really matter when all that is needed is to know what something is. A case can be made then, that acronyms are names.

There are good reasons for compressing phrases into initials. It's done in texting (**LOL**) and Tweets (**OMG**) all the time. Whenever a title or term is used multiple times, there is a tendency to abbreviate. Whether out of laziness or for the sake of expediency, it's common in any industry.

There are a myriad of acronyms relating to facility management, from organization names like **IFMA** (International Facility Management Association), to publications like the **FMJ** (a case in which an acronym became a formal name when the magazine's title was shortened from Facility Management Journal). Acronyms are also used to reference construction, design, workspace, industry standards and compliance issues ... too many to discuss at one time.

One area that has come to the forefront in FM deals with sustainable operations, with a slew of acronyms devoted just to these efforts. Some are new to the profession, and some are time-tested and can be reapplied in a different context. As a start, there are five areas to consider.

PROCESS IMPROVEMENT/ STANDARDS

Every FM focuses on efficiency and continual improvement. Concentrating on sustainability works to that end, but there are ancillary tools that can be used to set the framework for an overall approach. A good place to start is **TQM** (Total Quality Management). TQM is a set of management principles aimed at improving performance throughout an organization, and its tenets can be applied to any program that revolves around sustainable actions. It consists of facility-wide efforts to install and make permanent a culture in which the ability to deliver high-quality service is continually improved. Transferring the precepts of TQM to sustainability makes sense in facility management, where consistency is paramount.

Another tool for improving performance is provided by the International Organization of Standardization, or **ISO**. ISO is an independent, non-governmental, international organization with a membership of 162 national standards bodies. Through its members, it brings together experts to share knowledge and develop voluntary, consensus-based, market-relevant international standards that support innova-

tion and provide solutions to global challenges. There are several ISO Standards related to FM. In fact, there are three devoted especially to the industry: ISO 41011, devoted to Facility Management Vocabulary; ISO 41012, which provides guidance on strategic sourcing and the development of agreements; and ISO 41001, which takes it to the next level and provides a standard against which a facility management organization can be assessed and measured. ISO 14001 is another standard that helps organizations identify, manage, monitor and control their environmental issues in a holistic manner.

FINANCIAL

When a project is proposed, and funds are requested, the accounting department may have questions about the plan's viability. They probably want to know the return on investment, or **ROI**, of the work being done. They may ask what the internal rate of return, or **IRR**, will be. This is a metric used in capital budgeting to estimate the profitability of potential investments. The IRR is a discount rate that makes the net present value (**NPV**) of all cash flows from a particular project equal to zero. NPV is calculated to find today's value of a future stream of payments. It accounts for the time value of money and can be used to compare investment alternatives. ROI is a more immediate determination. NPV can outline savings that will be realized after the initial project is balanced out.

And, of course, as the discussion tends toward sustainability, there is the triple

bottom line, or **TBL**. This is an accounting framework with three parts: social, environmental and financial. Many organizations have adopted the TBL framework to evaluate their performance in a broader perspective to create greater business value. It is also referred to as “People, Planet and Profits.”

TECHNOLOGY

Tech is replete with acronyms! The world has gone digital, and pen-and-paper documentation has mostly been relegated to the past. To start with, there’s Computerized Maintenance Management Systems, or CMMS, which allows users to manage and accomplish maintenance practices in an effective manner. The use of CMMS can lead to a more efficient workforce along with major cost reductions.

Computer Aided Design, **CAD**, is a program that delivers drawing, or “dwg,” files in 2D electronic format. When FMs or architects mention “as-builts,” they’re usually referring to CAD drawings. CAD can be used in other ways, as well. When combined with a database, a Computer Assisted Facility Management (**CAFM**) program can be created. This is an interrelational program with CAD drawings that delivers specific FM capabilities. Changes in one file are reflected in another, so adds, moves and changes in a workspace can be entered into one spreadsheet or drawing and it will show up in both files. Asset management, maintenance programs and other modules make CAFM a robust tool for FMs.

An Integrated Workplace Management System (**IWMS**) is CAFM on a larger scale. The fundamental difference between CAFM and IWMS is that CAFM centralizes information about one facility, while IWMS centralizes information about the entire real estate portfolio.

BIM (Building Information Modeling) could be defined as CAD on steroids. Traditional building design is reliant upon two-dimensional technical drawings (plans, elevations, sections, etc.). Building information modeling extends this into 3D, augmenting the primary spatial dimensions of width, height and depth.

BAS (Building Automation System) is an example of distributed control of equipment in a facility. It is a network of electronic devices designed to monitor and control certain systems in a building, such as mechanical, security, fire and flood safety, lighting (especially emergency lighting), humidity control and ventilation.

ACRONYMS USED IN THIS ARTICLE

PROCESS IMPROVEMENT/ STANDARDS

- TQM** Total Quality Management
- ISO** International Organization for Standardization

FINANCIAL

- ROI** Return on Investment
- IRR** Internal Rate of Return
- NPV** Net Present Value
- TBL** Triple Bottom Line

TECHNOLOGY

- CMMS** Computerized Maintenance Management System
- CAD** Computer Aided Drawing
- DWG** Drawing
- CAFM** Computer Assisted Facility Management
- IWMS** Integrated Workplace Management System
- BIM** Building Information Modeling
- BAS** Building Automation System
- EMS** Energy Management System
- IoT** Internet of Things

EMPLOYEE CONSIDERATION

- 3-30-300** Ratio of utilities to rent to employee costs
- SBS** Sick Building Syndrome
- IEQ** Indoor Environmental Quality
- IAQ** Indoor Air Quality
- VAV** Variable Air Volume Plans & Measures
- BSC** Balanced Scorecard
- KPI** Key Performance Indicators
- CSR** Corporate Social Responsibility

EMS (Energy Management System) can be a part of a BAS or it can be a stand-alone system. It automates controls related to elevators, fire and safety, and metering. An EMS can also track and control energy expenditures and identify energy savings opportunities.

Tying everything together is the Internet of Things, or IoT. A dynamic, smart workplace is interactive and responsive to the needs of the employees working there. IoT refers to the devices connected to the internet through sensors or Wi-Fi. Each device collects and exchanges data, enabling systems to work together to maintain a safe, comfortable and efficient facility.

EMPLOYEE CONSIDERATION

Changes that affect human capital have a greater impact than those that improve only physical capital. Employee costs are, by far, the highest expense a company incurs. Any increase in productivity has a direct impact on the bottom line.

The 3-30-300 Ratio may not formally belong in a discussion of acronyms, but it falls into the “good-to-know” category. Coined by Jones-Lang-LaSalle (**JLL**), the ratio of utilities to rent to employee costs is one that can be used in evaluating successful building operations. It provides a basic breakdown of what a company pays per square foot of a building: US\$3 for utilities, US\$30 for rent and US\$300 for employee costs. This ratio reinforces the notion that saving money on energy or negotiating better lease rates are valuable but paying attention to personnel and increasing their ability to be more productive provides more benefit to corporate success.

Thus, it is important to provide safe, healthy, comfortable working environments. Indoor air quality (**IAQ**) refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of occupants. One way to ensure comfort is via a variable air volume, or VAV, HVAC system. Unlike constant air volume systems that supply a constant airflow at a variable temperature, VAV systems vary the airflow at a constant temperature.

Indoor environmental quality, or IEQ, includes air quality, IAQ, access to daylight and views, pleasant acoustic conditions, and occupant control over lighting and thermal comfort.

When IEQ and IAQ are ignored, get ready for sick building syndrome, or SBS.



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What's important to people is changing. We need to change with them and make products that meet their needs. The cheap way out isn't fair to the customer. People need something they can count on to last for years to come. Money is a factor. We need to convince the person in charge that this will last and will make a positive difference for the people in their spaces. Our customers have to make decisions every day. We aim to make products that help streamline the selection process. Providing people with a safe, pleasing, comfortable place to do business isn't just a priority, it's a passion. Making a space that people want to work in starts with the flooring. The right flooring sets the tone for the rest of the space. For the people in charge, it's about function and form. We have to be the best at both. Companies and their employees have high standards. We strive to live up to them. They don't speak our language. But we have to speak theirs and help their vision come to life. It's our job to make them look good. Flooring is what people use the most, but think about the least. To do it right, we have to talk to the people who use the floors. From the manager, workers, and the custodial staff - everyone matters.

This is when facility occupants experience acute health- or comfort-related effects, and the common denominator is time spent in the building. Avoiding SBS is one of the primary reasons IAQ and IEQ are so important. It is interesting to note that one area not covered by insurance is liability caused by SBS.

PLANS & MEASURES

As FMs decide to implement systems or upgrade their services, there are a few tools that help define and guide the process.

KPI (Key performance indicator) is a measurable value that demonstrates how effectively a facility department is achieving key operational objectives. Organizations use KPIs at multiple levels to evaluate their success at reaching targets. In FM, these can be indicators of water or energy conservation efforts, service levels, customer satisfaction, time to task, the ratio of reactive actions to proactive measures, or preventive maintenance (PM) program compliance.

BSC — the balanced scorecard — is based on the premise that more than one factor needs to be satisfied in any

facility undertaking. The BSC looks at strategic measures in addition to traditional financial measures to get a more “balanced” view of performance. This focus on high-level strategy and low-level measures sets the balanced scorecard apart from other performance management methodologies. The **TBL** (remember what that stands for?) can be viewed as a type of balanced scorecard. All three legs of the triple bottom line must be addressed in order for endeavors to be deemed successful.

The overarching goal of progressive organizations in the international business world is to be able to report on their corporate social responsibility, or CSR, efforts. Also called corporate conscience, corporate citizenship or responsible business, this is a form of corporate self-regulation integrated into a business model. A business monitors and ensures its compliance with the spirit of the law, ethical standards, and national or international norms. Sustainability practices and their positive effects are reported here and play a major role in these efforts.

For a new FM, learning acronyms is like picking up a new vocabulary ... extending the knowledge of language needed to identify and implement continuous improvement. Understanding the concepts behind the abbreviations can lead to streamlined operations, increased customer satisfaction and stakeholder appreciation. As more acronyms arise in the workplace — and they will — it’s wise for FMs to stay aware of new terminology and decide what fits their needs. It’s the SMART thing to do (Specific, Measurable, Attainable, Realistic and Timely). **FMJ**



Bill Conley, CFM, SFP, FMP, LEED AP, IFMA Fellow, is facility manager at Yamaha Motor Corp. in Cypress, California, USA. He has more than 40 years of experience in FM and has been a proponent of sustainable operations for more than 20 years. Conley has served on the IFMA board of directors, is a recipient of IFMA’s distinguished member of the year award and has received the association’s distinguished author award three times.

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Article

6 Reasons Why Your
Organization Needs a Digital
Accessibility Policy

digital accessibility **for all**

BY ADRIAN ADRIANO





What if blueprints for state-of-the-art facilities lacked plans for elevators, wheelchair-friendly restrooms and handicapped parking? Getting in and around the building would be a nightmare for people with mobility issues, the elderly and young families. Not to mention it would be illegal. As ridiculous as it seems to discount accessibility features for modern homes and buildings, the reality is that many people in today's digitally connected society find themselves in a similar situation when it comes to leveraging modern technology.

Consider for a moment how someone with limited sight might use a modern smartphone without raised buttons on the screen to guide them. Or how difficult it may be for that same person to navigate a television screen without a feature that describes what is currently selected. Using technology that lacks adaptations for their needs would be incredibly frustrating, especially considering many interactions for work, school and recreation are conducted using a screen.

These realizations are even more startling when one considers the amount of people who need special accommodations. More than 18 percent of people in the United States have a disability, and this community represents more than US\$200 billion in discretionary spending, according to the United States Census. Ensuring that technology solutions — and the network they operate on — meet the needs of these customers isn't just the right thing to do, it's smart business. But how to achieve accessibility?

Innovations like smart technology, including context-aware electronic devices that monitor and analyze their surroundings to perform autonomic actions by connecting to other devices, and Internet of Things (IoT) technology (the connected network that allows for these autonomous actions) provide greater ease of use for visitors requiring special accommodations. By investing in smart technologies and IoT networks, facility managers can dramatically ease the lives of their guests by making their buildings and the technol-

ogy in them more accessible. Additionally, partnerships with providers who understand accessibility will greatly assist property managers and owners in meeting the needs of all visitors and their families.

Invest in 'Smart'

Because of smart technology's ability to sense, monitor and adapt to the surrounding environment, it offers unparalleled ease of use to both building owners and guests to efficiently manage lighting, thermostats and entertainment devices. According to analysts, smart technology's popularity is only expected to increase. In fact, Zion Market Research predicts that smart technology devices will reach a global market of US\$53.45 billion by 2020, which is a compound annual growth rate of more than 14.5 percent between 2017 and 2022. The researchers cite government initiatives, an aging population and a growing awareness about energy consumption as reasons for the uptick.

Armed with this knowledge, facility managers must anticipate visitor expectations to have these options in their work spaces and to integrate popular smart amenities such as remote-controlled locks, voice-activated lights and connected appliances. Such innovations will not only help those in need use the building more independently, but they will also simplify overall operations.

For example, voice- or motion-activated light switches, will enable visitors to easily turn on and off the lights without needing

to look or reach for switches. Remote-controlled locks and thermostats also provide ease of use so that property managers no longer have to patrol each floor physically to ensure lights are off. Not only will guests enjoy the added convenience of having smoother and more streamlined building operations, but electricity savings will be greater, too.

The key to making smart technologies successful lies in the network that supports them. Multifamily properties need a high-performance network to handle all the advanced traffic streaming across its network. Smart technologies function on the basis that they're connected to an IoT network and high-performance internet, so guests may remotely monitor and control their environment.

The downside is as the number of devices are deployed, the network may slow or experience reduced performance. So, while it is critical that facility managers and building owners implement smart technologies into their buildings, they must also ensure the network on which it all operates can handle these changes. By working closely with providers to upgrade wiring and install new technologies, such as DOCSIS 3.1 for gigabit speeds, facility managers are assured their properties are ready for the smart technology revolution.

Accessibility Services

Partnering with providers who understand and offer accessibility services is one of






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In fact, a landmark study by Forrester and Microsoft more than a decade ago revealed that nearly 60 percent of working-age adults in the United States were likely to benefit from accessible technology, even if they don't necessarily identify as having what's commonly categorized as a disability.



the easiest and most impactful ways that property managers can ensure they're up-to-date and offer the best in accessibility. Good providers will stay on top of accessibility trends, offer specialized customer support tailored for the facility's specific needs, and they'll provide guidance on which services and products will fit the facility's guests best.

To be sure the right provider is selected, do some research about the company. Closely examine their track record to see if they collaborate with advocacy organizations, community leaders, stakeholders from government agencies or tech entrepreneurs leading the accessibility space. Also look for providers who have staff specially trained on and dedicated to accessibility features and general support issues, so they have the necessary knowledge and experience to meet the facility's needs.

The right providers also offer advanced technology such as voice-controlled remotes that empower users to find the content they're looking for just by asking; program guides that provide audio descriptions of cursor selections to allow those with limited vision to interact with technology; and eye-gaze tracking technologies that enable people to select content using only their pupils.

For example, in the telecommunications space, the leading accessibility providers offer voice-enabled television interfaces that help users navigate the platform. Using voice guidance, an advanced system can read aloud descriptions and selections from a menu so visually impaired guests can interact with digital interfaces.

Commitment to Accessibility

Providing accessible products and services

is not a "nice-to-have" amenity reserved for a small portion of the population. Accessible products and services benefit all. Someone who is sighted will still benefit from the ease of use that comes from getting exactly what is requested by using a voice-controlled remote. And captions don't just help those with hearing loss, they provide context to the 85 percent of Facebook users who don't watch videos with sound, according to Digiday.

In fact, a landmark study by Forrester and Microsoft more than a decade ago revealed that nearly 60 percent of working-age adults in the United States were likely to benefit from accessible technology, even if they don't necessarily identify as having what's commonly categorized as a disability.

In the report, Madelyn Bryant McIntire, director of the Accessible Technology Group at Microsoft says, "We knew they could help dispel the traditional idea that people fall into only two categories: those with disabilities and those without. In fact, there are millions of people along the continuum of human ability for whom accessible technology can make a difference."

People think of accessibility products as targeting a niche demographic, but the reality is accessible design builds better products for everyone. Not only do accessible products provide ease of use and independence to the intended population, but they enhance the user experience for everyone else, too.

Every day, people enter buildings and interact with technology. They flip on lights, surf for something good to watch on TV or craft an email on their computer. The thin wall between the digital and in-person

experience is crumbling. Facility managers need to be sure that people requiring special accommodations — whether it's someone with a disability, an elderly visitor or young parents strolling their baby around — aren't left out of the experience.

By investing in smart technologies and ensuring the proper network is available to support and operate them, and by partnering with providers who understand accessibility and realize that a building founded on accessibility is better for everyone, property managers can ensure that their doors are open, inclusive and attractive to all. **FMJ**

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Adrian Adriano is the VP of Strategic Initiatives at Xfinity Communities overseeing the strategy and direction of Xfinity Communities and Xfinity on Campus. He has more than 20 years of marketing and management experience in the telecom market. Adrian has an MBA from Our Lady of the Lake University and has completed executive leadership programs at The Wharton School at the University of Pennsylvania and Stanford University.

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PREPARING FOR THE FUTURE

OWNING YOUR O&M BUDGET



BY ALEXANDER J. WILLMAN

Developing and monitoring annual operations and maintenance budgets is often a chore that is akin to cleaning out grease traps — necessary, but rarely a task that tops anyone’s “get this task completed and receive compliments from everyone” list. While there is no guarantee that a well-planned budget will receive more O&M funding from the organization’s bean counters, there are methods facility managers can use — including evaluating past years’ O&M budgets as well as other valid information sources — to show the CFO that future O&M budget requests are sound. In other words, they are based upon the facility management operation consistently tracking O&M costs.

Developing and monitoring annual operations and maintenance budgets is often a chore that is akin to cleaning out grease traps — necessary, but rarely a task that tops anyone’s “get this task completed and receive compliments from everyone” list. While there is no guarantee that a well-planned budget will receive more O&M funding from the organization’s bean counters, there are methods facility managers can use — including evaluating past years’ O&M budgets as well as other valid information sources — to show the CFO that future O&M budget requests are sound. In other words, they are based upon the facility management operation consistently tracking O&M costs.

In addition, presenting new O&M budgets in the context of the organization’s mission and vision, including sustainability goals, will show that the facility management team is fully cognizant of the value that FMs bring to this aspect of the corporation’s face to the public.

With O&M costs always considered an expense against profits, it is essential to gain insight into the drivers of CFO decision making. The results of a Duke University School of Business annual poll of CFOs revealed nearly half believe that the

United States economy will be in a recession by the end of 2019, and 82 percent believe that a recession will have begun by the end of 2020. While this may not apply to every global corporation, it is a wake-up call that the past years of low interest rates and a rising stock prices are ending.

How does this impact a facility management operation? It means that future year O&M budget submissions — whether to those in the initial stages of the chain of command, or ultimately to the CFO — need to be more detailed. It is not enough to rehash a wish list from prior years and add an inflation factor. If the O&M budget submission format that the facility management operation has used in past years is an Excel spreadsheet with current costs and budget requested amounts, this needs to be augmented to show the reasons for O&M budget increases (see table on following page).

Using the financial terms that the CFO’s office uses with all departments in the organization is also essential. Demonstrating the net present value (NPV) of repairs or replacement of critical equipment is the first step. It goes beyond, “I need a new chiller because this one is old and failing.”

Use the future time frame and cost of

capital — these are available from the CFO — as the necessary inputs to create an NPV calculation. This can be readily calculated by existing free software. Also ask about the time horizon of future corporate budgets — is it three years or 10 years? Finally, find out if the CFO is amenable to a life cycle cost analysis of the property, equipment and any systems that fall under the maintenance responsibility of the facility management department.

For example, the Office of Facility Management within the Bureau of Overseas Buildings Operation of the U. S. State Department has funding responsibility for the 270 overseas embassies and consulates maintained for federal civilian foreign properties. That office developed a detailed maintenance and repair (M&R) spreadsheet for future year annual budget submissions.

The cost components were based on a template of allowable M&R costs that had been developed over eight years and refined by not only the facility managers at the embassies, but also accountants in the Office of Financial Management.

Table 1 shows a section of the M&R cost components that needed to be completed — or left blank if no funding was request-

	A	B	C	D	E	F
			ANNUAL COSTS			
1	TABLE 1	Allowable Replacement	Repairs Planned	End Service Life Replacement	Planned Replacement	Engineering (replacement only)
2	Replacement	Air conditioner, single compressor 3 tons and greater (36,000 BTU/H)	0	0	0	0
3	Replacement	Baseboard heating, hard wired electric with same size units	0	0	0	0
4	Replacement	Bathroom cabinets and countertops	0	0	0	0
5	Replacement	Boilers, electric, natural gas, oil, diesel	0	0	0	0
6	Replacement	Countertop replacement (in-kind)	0	0	0	0
7	Replacement	Standard air conditioner filters (excludes chem-bio filters)	0	0	0	0
8	Replacement	Drain piping to municipal drain	0	0	0	0
9	Replacement	Electrical panel box: replacement with like size	0	0	0	0
10	Replacement	Electrical wiring	0	0	0	0
11	Replacement	Fan coil units: replacement with equivalent size	0	0	0	0
12	Replacement	Fences: replace with equivalent size	0	0	0	0
13	Replacement	Furnaces	0	0	0	0
14	Replacement	Gates, security, perimeter fence (see security matrix)	0	0	0	0
19	HOW TO ACCOMPLISH CHANGE					
20	<p>Set up a meeting to review future O&M costs with staff, reliable service contractors and others such as manufacturer’s representatives, utility company sources and local supply house firms. Designate one person on staff to gather comments from these meetings and identify expected or anticipated cost increases that impact the O&M operation.</p> <p>Compile these comments into the O&M cost components that are relevant to the organization. Use an electronic table format that can be understood by all who contributed to these costs.</p>		<p>Examine or initiate a comprehensive facility condition assessment (FCA) for all critical properties and equipment. The scope of work for an FCA needs to be detailed regarding which properties, what equipment and what level of service life costs are needed. When completed by either in-house staff or contractors, a well-defined FCA can provide the facility management operation with the remaining service life on critical equipment. This can be another baseline record to show the CFO that, just as IT departments justify new hardware, the FM team has a firm understanding of critical equipment status and replacements needed.</p>		<p>With or without an FCA, identify those future O&M costs that will have the greatest impact on the overall budget. Contact the CFO’s office for their format for future corporate budgets and use that as the template for the facility operations budgets. If possible, use the generic name of the O&M cost categories (in column one of the example maintenance and repair, or M&R, budget request). These items are essential to consistent and reliable operations. Then identify current year O&M costs in the second column, then costs for years 2 through 5 in the next three columns. Total all columns at the bottom and calculate percentage increases.</p>	

ed — for each embassy’s FM operation. To ensure that the budget entries were genuine, specific instructions were provided and a webinar was held by the headquarters of the Office of Facility Management to all FMs and their staff.

Once all M&R budget request entries were received, they were “rolled up” into the computerized maintenance management system (CMMS) at the headquarters of the Office of Facility Management.

A detailed review was conducted; then a one-page overall M&R budget summary was provided to the director of financial management and his staff, including all the budget details from each embassy’s M&R budget submission.

This allowed the director and senior staff to demonstrate, in detail, the M&R costs needed to properly maintain, repair and replace embassy properties, equipment and systems. First complet-

ed in fiscal year 2017, this CMMS budget serves as the M&R baseline for subsequent years. This enables detailed comparisons between similar embassies in regions that have comparable climates and local resources.

With the turnover of 200 or more FMs being assigned to a new embassy every two to three years, these electronic M&R budgets were essential for maintaining consistent budgets. Another benefit of this

budget process was to answer recurring questions from Congressional staff members about the costs of maintaining embassies and consulates.

When developing future year O&M budgets, questions will always arise concerning the amount to allocate for the costs of unexpected equipment breakdowns and emergencies. Is a 10 percent contingency enough if you are managing a 50-year-old property that has to operate with a 99 percent reliability factor?

There is no solid answer to this question, because of the complexity of commercial, institutional and industrial building systems today. The pneumatic control systems of yesterday — once the tubing was fully installed and tested for leaks and the full system supplied with compressed air — were more reliable than the solid-state building automation systems (BAS) of today.

Locating controllers for a BAS that is more than six years old is a major challenge, let alone updates to the operating software. Knowing what equipment must be controlled for reliable operation, and the service costs for these controls, are essential for future cost planning.

Networking with other FM's who have similar control systems is the best way to gain firsthand M&R costs. For future O&M budget planning, the amount to include for the cost of unforeseen M&R is dependent on the previous experience of FM staff, colleagues and reliable service contractors in the area.

If the requirements for monitoring O&M costs during the corporate budget cycle are not mandated by the CFO, receiving cost reports twice per month is the minimum. Reports should be weekly at the end of the budget cycle. If the CMMS is relied upon for consistent O&M costs, then tout that up the chain of command to the CFO. If the CMMS is inconsistent or unreliable, start the discussion with other FM's to find out which CMMS vendors have demonstrated they know how to meet the product and service needs of similar organizations.

In conclusion, the process of developing future O&M budgets is not only an essential planning tool for the facility management operation but it can also serve as the basis for monitoring and reporting these costs during the annual business cycle. With many CFOs forecasting an economic slowdown in the near future, now is the time for O&M budgeting and monitoring to demonstrate consistency to the organization's executive leadership. **FMJ**



Alexander J. Willman, P.E. is president of AJW International, LLC (ajwi.world). His previous experience includes actively planning and directing funding of US\$140 million in facility M&R budgets to 240 U.S. embassies and consulates worldwide. He successfully demonstrated to decision makers increased M&R budget requirements based on 131 new embassies constructed since 2005.

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THE FOURTH INDUSTRIAL TIDAL WAVE



BY ANDREW SUGARS

We live in an era of change. These words have been uttered many times before — no doubt during the first, second and third industrial revolutions. However, now we're living in the fourth era of breakneck-speed transformation, in a world that blurs the line between cyber and physical systems, and FMs cannot help but ponder the future as we marvel at how drastically things have changed in the last few years. As an industry, facility management is very good at marveling at and pondering the megatrends that continue to shape our private and professional lives. It is not, however, very good at responding at a comparably breakneck speed. Unlike the tech market that exists to cater to every single need and desire for an “easy life,” the built environment has some work to do in this regard.

Think about the tech that we have access to in our personal lives. How many people don't yet carry a smartphone? These pocket-sized portals triple as entertainment systems and personal assistants that can connect us to anyone, anywhere, at any time. What's more, these devices are arming us with the most powerful gift — knowledge. Thanks to a new technological renaissance, we are all capable of knowing absolutely everything in a heartbeat.

At home, we have access to voice-enabled virtual assistants that can answer any question we throw their way; wireless speakers that fill every room with immersive sound; and motion presence sensors that not only have the power to control our homes, but can actually teach our homes new tricks by telling them what

to do when we're asleep, awake, away and back home again.

To remain competitive in the fourth industrial revolution, brands from across the sector spectrum are experimenting with the potential of artificial intelligence (AI) and machine learning (ML) to not only get top talent to buy into their business, but also to improve the experience of anyone who interacts with their brand. Companies like Toyota, Volvo, MasterCard, Experian, Coca Cola, Heineken, BP, Netflix, Walmart, Disney — and the list goes on — are using big data, AI, advanced analytics and robots to streamline and improve operations, products and services. For these brands, the user experience is paramount. To that end, they are using data and tech to offer better experiences to employees and cus-

tomers. By doing so, they are driving overall business performance.

In the face of relentless technological advancements and soaring expectations, there is an argument that every business should be a digital business. Go to any FM conference and tech will dominate the agenda. In the UK, the Royal Institution of Chartered Surveyors (RICS) Commercial Property conference in December 2018 championed the tech conversation. Every speaker argued that the built environment industry needs to figure out how to blend technology with human behavior. In the United States, IFMA's World Workplace® in 2018 also had as its big message that tech is now considered part of the workplace ecosystem.

FMs now work in partnership with HR, FM and CRE to deliver and enhance the

FMJ EXTRA *Book*

The Fourth Industrial
Revolution

employee experience. When IFMA's World Workplace Europe® took center stage in Amsterdam in March, thought leaders emphasized the importance of collaboration between all stakeholders within the built environment — and technology is the glue that binds them. In an increasingly globalized economy, facility and workplace professionals cannot collaborate without it.

The FM industry has to ride the tidal wave of technology that's crashing down on the market. If it lets itself get swept along with the tide, it will eventually drown. We've had enough tech talk. The time has come for action.

UNCHARTED WATERS

Facility managers increasingly find themselves needing to be braver and more exploratory in their approach to finding tech-led FM solutions and consultants.

There are various benefits in using tech-led FM solutions. Tech-savvy service providers focus on how to be better at what they do. That involves looking at all of the systems and processes within a business with a view to transform the digital and virtual platforms, so they better support the organizational needs. Once that's been achieved, companies can crank it up a gear and use the same methodology to help customers understand their buildings better — specifically how people interact with the spaces provided. That, in turn, will arm customers with the data they need to become more efficient themselves. If it's done right, everyone's a winner.

Every time an organization completes an acquisition, it ends up with another platform. This leads to a process of consolidating systems into one unique tech platform that streamlines processes and enables shared learning. As part of the integration process, FMs look for the best technology within the group — and what will help everybody improve performance and become more efficient in terms of what they're doing and how to deliver value to the customer. Tech-led vendors spend a lot of time and effort identifying ways of being more efficient and structuring the business in a way that allows customers to collect and formulate data.

Despite the fact this is an ongoing process, technical solutions are constantly evolving to meet FM service needs. For example, distribution centers use technology to improve the efficiency of goods coming in and going out of the facility. Thanks to the real-time data capture of new tech, FMs

can account for everything from people movement to spillages. Another example is in the health care realm where technology is used to improve the patient experience.

It's not about developing capabilities based on overarching megatrends that the world is bearing witness to; nor is it about starting from scratch or "tech for tech's sake." It's about developing situational awareness skills inside the business to map technologies for market needs. The name of the game is to drive efficiency of service, and that all-important element of experience, by first understanding how people interact with their physical, virtual and social infrastructures; then by using that understanding to build tomorrow's facilities using today's technology.

SMOOTH SAILING

Let's face it, when it comes to tech, the FM industry is still finding its footing on what it considers to be a plank, so diving into the deep end won't feel particularly comfortable. Nor will it happen anytime soon, not without a fair bit of pressure anyway. Aside from a case of nerves, there are a number of other wobbles to set straight.

The industry still very much operates in thick silos. The functions that naturally interact with the tech provision do not always talk to each other. Facilities, property, digital and people services departments tend to operate as individual entities as opposed to a collective. This poses a problem when it comes to ownership. Who's responsible for getting things rolling? Is it the FM, the head of commercial real estate, the CTO or the HRD?

Do we need to create a new role — a hybrid of these functions? If future leaders are to merge and manage the worlds of the physical, the social and the virtual, they will need a richer, more diverse set of skills. This requires an element of talent engineering, something the industry might struggle with because it is still learning the tech language. When it comes to achieving fluency in this new language, we have to

remember who we're learning it for, and who we will be using it to speak to.

Architect Cecil Price once pondered, "If technology is the answer, what was the question?" The question for FM hasn't changed. It still concerns how we can best "facilitate" business and employee needs. If we use technology to better support those relationships, so that we understand what our customers are thinking even if they are not giving us direct feedback, then our level of service will increase, as will our value. Value-add will come from the combination of engineering talent and boosting operational excellence, and tech offers the foundation for that much-needed unity.

The world has always been subject to change; but in 2019, it is the pace of this change that is truly setting our potential as a species, and as an industry, alight. Future facility management will be massively technology driven. It will be a tech-led business function that provides combinations of people-based, robotic-based and algorithm-based services. The companies that are going to succeed are the ones that realize power comes from coalescing smaller groups of highly skilled people who understand the industry and can use tech to support the people function. People are still at the heart of FM, after all. The robots will just give us the time and freedom to be even more human. **FMJ**



WARREN WONG VIA UNSPLASH



Andrew Sugars is Group Chief Corporate Development Officer for Atalian Servest. Since immigrating

to the UK from Australia in 1995, he has spent the majority of his career working in the facilities solutions sector helping clients find the best facilities mix. Andrew joined Servest in June 2011 bringing with him strengths in leadership, motivation and customer experiences. Andrew's areas of focus lie heavily on contributing to Atalian Servest's ambitious global growth strategy, cementing its position as one of the leading FM organizations in the world.



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FMJ How is FM:Systems evolving with current technologies?

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FMJ What has been the most positive feedback you've received from clients?

FM:SYSTEMS The most positive feedback that any company can receive, we believe, is that our clients continue to stay with us with a high degree of satisfaction year over year. We take great pride and care in creating a wonderful experience

from initial contact through their entire customer lifecycle with us which in several cases has been greater than 15 years. Our employees live by our core values to “always do the right thing” and that is translated into every customer engagement as well as how we interact with one another. Many of our clients truly feel like family to us and trust that we will provide them with the solutions they need every single day to help them manage even the most demanding facility challenges.

FMJ Tell us about your company culture?

FM:SYSTEMS We are growing quickly and working hard to ensure that we provide a wonderful environment for our employees to work and thrive. FM:Systems actually provides a variety of technologies for the workplace such as digital signage solutions for room scheduling and mobile solutions for the FM workforce. We use these solutions ourselves within our own facility and combine those with a flexible, beautiful work environment which includes reservable sit to stand workstations and other amenities to create the kind of environment that we would want for our customers. We also have several internal employee driven initiatives such as GROW which stands for Grow Relationships & Opportunities for Women at FM:Systems as well as a “Culture Club” and Sustainability initiatives.



CSP LEVEL Silver | CSP SINCE 2014 | WEBSITE www.connectrac.com

FMJ How does Connectrac® help facility managers become more successful in their roles?

CONNECTRAC Facility managers are tasked to do the miraculous like provide more power and cable management in a space overnight, so the room can be re-utilized. For 14 years, Connectrac® has helped by offering a non-disruptive floor mounted wireway that provides flexibility for current and future needs. Behind closed doors, the product development team has been quietly creating a product line that will dramatically enhance their easy-to-use system by including more flexibility, more options for a space, more quick changes and more FM happiness. Look for it in Oct. 2019.

FMJ Tell us about working with your clients?

CONNECTRAC Walking past the Connectrac® booth at IFMA you will see Connectrac staff in their yellow shoes and hear Facility Managers speak these words, “Best thing I’ve found in the last 10 years.” JAMS, the largest private provider of mediation and arbitration services worldwide, said, “After using Connectrac for our first installation, we don’t have the need to search for another solution.” One government

project, which encompassed 13 floors of power and cable management, happened because an FM was extremely particular and wanted an elegant solution. The project manager set up a mock-up of Connectrac to show the facility manager how simple it was and 13 floors later the building representative couldn’t be happier.

FMJ How does Connectrac® eliminate the need for core drilling or saw cutting a floor?

CONNECTRAC This is the most popular question that FMs ask us because it is the most messy, noisy and disruptive activity they manage. Some teams purchase large quantities of Gaffers tape while others have created unique solutions to hide cables and power running along the floor. We create a wireway that sits on top of the concrete floor with nearly 3’ wide of transition ramps alongside it. This creates a subtle hidden system that can be glued, taped or screwed to the floor eliminating mess, noise and disruption. All the pre-wired power and data cables fit neatly inside where they are protected and can travel wherever they are needed. For 14 years Connectrac has been helping FMs stay away from these types of messes.

OTIS

CSP LEVEL Gold | CSP SINCE 2019 | WEBSITE www.otis.com

FMJ What innovations are being developed at Otis?

OTIS Otis is reinventing itself as a digital industrial company to meet the needs of customers in the digital economy and the era of intelligent buildings, smart cities and hyper connectivity.

The launch of our Otis ONE IoT service platform exemplifies this. Our approach to service includes a commitment by the entire Otis team to combine movement and connectivity in new and exciting ways through technology and the Internet of Things. We're using IoT and data from the largest service portfolio in the world to enhance our ability to actively monitor and predict maintenance needs for each individual customer — across a single site or an entire portfolio by leveraging our 30 years of experience connecting elevators.

When mechanics are on site, they have digital tools and proprietary Otis apps to do their job more efficiently, to fix issues before they cause shutdowns and to get elevators back into service faster when they do shut down, resulting in reduced downtime. Our customers benefit

from enhanced reliability, efficiency, stronger communication and real-time equipment updates.

FMJ What do you see on the horizon for FMs and technology?

OTIS New technologies are transforming the way we move, and rapid urbanization have made elevator and escalator technologies more critical than ever. At the same time passengers have new expectations for their residences, workplaces and recreational spaces. As a result, our customers need service that is faster, more customized and more digital.

In today's smart cities, everything is tracked using the IoT. In our industry, we are uniquely positioned to understand traffic patterns inside the walls of a building. We collect lots of data to understand how buildings operate, how buildings are used, how people actually move through buildings; so, we can get them to their destinations quickly, safely and comfortably.

Data can move between walls, but people cannot. How we utilize this information as an industry is something we're focused on.

FMJ What do clients say about Otis?

OTIS Otis ONE was created using customer input and feedback to specifically address issues they said are most important to them. The platform offers transparency with easy access to information on equipment data and performance. We can notify our customers when there's an issue and provide faster service. And predictive maintenance can offer improved equipment uptime and fewer unexpected shutdowns.

FMJ Tell us about your commitment to the community?

OTIS Otis gives back to communities around the world through contributions, in-kind donations and countless employee volunteer hours. For example, Otis volunteers support Special Olympics in the U.S., France and Japan. We sponsor Little Engineer programs in Hong Kong, elevator safety programs in China and Korea and orphanages in India. These are just a few examples of our global commitment to make the world better.

Otis is the world's leading manufacturer and maintainer of elevators, escalators and moving walkways. Founded more than 165 years ago by the inventor of the safety elevator, Otis offers products and services through its companies in nearly 200 countries and territories. Every day, Otis moves more than 2 billion people through the world's urban landscapes.

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Is FM Prepared for a Technical Labor Shortage?



FMJ EXTRA
Video

Five Trends Coming to
Work in 2019



Employers are having trouble filling millions of middle-skill jobs — which is the largest proportion of the global workforce, encompassing 40 percent of all workers. According to a 2018 Manpower Talent Survey, “global talent shortages have reached an all-time 12-year high, and more employers than ever are struggling to fill open jobs. Forty-five percent of employers say they can’t find the skills they need, and for large organizations (250+ employees) it’s even higher, with 67 percent reporting talent shortages in 2018.”¹

Lack of skilled labor

This issue extends to nearly every industry, including facility management. The survey goes on to state skilled trades, engineers and technicians are among the top five in-demand roles, and “one in four employers says filling skilled trades roles is harder this year than last.” What does this mean for the future of FM? There is a lack of trained technical and trade professionals entering the workforce. The average age of an FM is approximately 49, so more than half of today’s FM practitioners are expected to retire in the next five to 15 years.

The survey asked, “Why does this problem exist?” and discovered a third of employers cited lack of applicants. Lack of experience was cited by 20 percent of respondents, and 27 percent named lack of hard skills or human strengths as a contributing factor. “Globally, more than half (56 percent) of employers say communication skills, written and verbal, are their most valued human strengths followed by collaboration and problem-solving.”

New Industrial Revolution

In addition to the lack of skilled labor, we are in a new era called the Fourth Industrial Revolution. Driven by innovative technologies, this revolution means a fundamental change in the global economy, society, and certainly, how we operate and manage buildings. Smart cities are part of the blending of these new technologies. They require more advanced technical knowl-

edge than previous training programs offered. Maintenance workers have now taken the role of data scientists, particularly when they are getting real-time data from their Internet of Things (IoT) devices to make better decisions. This new role has been dubbed the “sexiest job of the 21st century” by Tom Davenport, a well-known analytics and business process innovation author.²

The 17 UN 2030 Sustainable Development Goals (SDGs) and climate change are also considered part of the Fourth Industrial Revolution, with many innovations happening in cities, government agencies and companies to meet these sustainability goals. FMs need to understand how maintenance and operations can impact these 17 SDGs.

In the book “Life after Carbon,” John Cleveland and Peter Platvik describe how 24 forward-thinking cities are redefining every aspect of a city. This includes buildings,

UN 2030 Sustainable Development Goals

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation, and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice and strong institutions
17. Partnerships for the goals

streets, neighborhoods and components of the entire city infrastructure: the supply and demand of water, energy, transportation, natural elements and waste disposal. These cities are creating Urban Climate Innovation Labs (UCIL) to tackle climate change.

Goals include the elimination of fossil fuels and adoption of alternative transportation. Buildings should minimize the amount of energy used or produce a surplus of energy for sale. The concept of “circular economy” should be adopted, where consumption is reduced, and recycling or reuse eliminates some of the massive amounts of solid waste sent to landfills and waterways. Finally, by 2050, the goal is to reduce by 80 percent global greenhouse gas emissions.

Making these changes requires new ways of thinking, new technology and skills training for maintenance and operations staff to support an organizations’ environmental, sustainable and corporate governance goals (ESGs).

Are we prepared?

Through the Global Workforce Initiative (GWI), the IFMA Foundation has identified four areas of focus to fill the maintenance and operations talent gap. They are: training and development, internship/apprenticeship programs, job shadowing programs and recruiting outside the usual sources.

Training and development

Consultants are noticing an alarming trend in FM departments. There is an increase in aging building managers and engineers who are about to retire, leaving organizations without trained replacements qualified to operate and maintain their building systems. This loss of institutional knowledge requires a robust training and development program. Of course, outsourcing these functions is always an option. Keep in mind FM vendors are also dealing with the talent shortage; however, many are working on creative workforce development solutions. For those FMs relying on outsourcing firms to manage their buildings, it’s critical to understand the vendor’s training and development program. How are they training incumbent workers and new employees? How are vendors held accountable? How are FMs specifying their requirements?

To address the challenge of insufficient wholistic guidelines for training, particularly in the technical fields, the IFMA Foun-

ation’s Global Workforce Initiative, with support from the International Facility Management Association (IFMA), has released a new Facility Management Training and Development Framework. The Framework provides needed guidance on acquiring or demonstrating mastery of specialized skillsets in operations and maintenance.

“This is a tremendous opportunity for organizations across the built environment community to share and cross-promote their training resources,” said Graham Tier, IFMA Global Board of Directors Chair. “Practicing FM professionals can use the framework to bolster their own skills, train their teams or hire qualified team members. Aspiring FM professionals can identify a career path that gets them the training they need to take the next step.”

The GWI team is working with community colleges to provide FM technical education to meet the growing workforce demands. These programs incorporate trade and technical education with IFMA’s suite of certifications and credentials, giving students a well-rounded trade, technical and business education. Using the Framework, GWI is piloting contract education programs where companies and organizations can customize their FM training curriculum. This is developed by FM professionals and faculty that can deliver the training on company premises, increasing employee attraction and retention.

Internship/apprenticeship programs

IFMA continues to work to establish multiple pathways into the profession. In the past year alone, with the assistance of the Chesapeake and Capital Chapters, the State of Maryland and the Anne Arundel County Workforce Development Board established an FM Internship Program. This program, which combines classroom instruction with on-the-job learning and a pathway to employment, was a success with dozens of participants making the transition from FM student to FM professional.

This program will be replicated across Maryland and nationally through the establishment of a federally recognized apprenticeship program for FM. Now more than ever, new ways of working require new ways of learning. This includes flexibility and an ongoing commitment to prepare the workforce for the jobs of tomorrow.

Job shadowing programs

There are many trade and technical col-

leges eager to work with companies that provide internships to their students. The GWI is working with technical, trade and community colleges to increase the number of students interested in FM as a career of choice by introducing FM coursework and promoting internship programs. Chaffey College in Rancho Cucamonga, California, USA, is one example where students learn on the job while exploring the variety of positions in the field.

“As part of the curriculum, students receive college credit for participating in their paid internship, which is a minimum of 70 hours,” said Phyllis Meng, Chaffey College Professor and IFMA Fellow. “Since the students receive college credits, there are criteria required by Chaffey College along with host organizations like ABM.”

These internships can be life changing as Elizabeth Zamora discovered after being hired by ABM. “Thanks to ABM’s internship program, I soon realized what my true passion is. I am truly fascinated with operations. I found a guided pathway to what I am beyond a doubt passionate about,” she says.

Many students are attracted to the high salaries in FM as well as the sustainability and climate change impact the industry can make. One way to expose people to the field is through a job shadowing program. The Local Bay Area Chapter of AFE and the IFMA Foundation are launching a job shadowing program called “A Day in the Life of an FM Professional.” Students start with a breakfast meeting where they are paired with an FM professional who hosts them for a day in their facility. At the end of the day, all the students and FMs meet back at a designated site for dinner and a panel discussion on FM career paths.

“Most of the hosts schedule activities at their site that expose the students to the wide variety of our work and responsibilities, along with tours of our facilities and introductions to the teams with which we coordinate” said Bob Dills, IFMA Foundation Trustee. “Job shadowing is an excellent way to expose students to the world of FM and job opportunities they might not have thought of.”

Recruiting

Talent acquisition leaders must be more creative than ever in their approaches to attract new employees. To this end, companies are recruiting from outside the usual sources. As one example, GWI advisor, Sodexo, recruits directly from IFMA conferences and partici-

pates in the Foundation's Ignite FM! Student Challenge program to gain access to Foundation scholarship winners.

In January 2019, Sodexo launched SoTogether Facilities Management as part of its drive toward gender equality. The aim of SoTogether FM is to increase gender diversity in facility management roles, especially at more senior levels. In addition, they launched an internal Yammer group, which is a go-to place for technical information, industry news, learning and development pathways, along with profiles of role models and rising stars within the company.

"Sodexo fosters an open, inclusive culture where everyone can thrive. The company's global gender balance strategy is a key driver in ensuring that both women and men have equal access to growth and opportunities in our workplace," says Deborah Rowland, Sodexo Director of Public Sector Affairs.

"Had it not been for the IFMA Greater Triangle Chapter supporting the IFMA Foundation Scholarship program and Ignite FM! Student Challenge at IFMA's World Work-

place®, I would not have the job that I have now at Sodexo," said Devin Shackelford, an IFMA Foundation 2018 scholarship recipient. "I was fortunate enough to have people from Sodexo witness and judge my Ignite FM! competition presentation. Fortunately, the Sodexo judges were impressed with my skills and abilities and offered me a position as an operations support specialist for their Walgreens portfolio. I'm excited to be in charge of their computerized maintenance management system."

Summary

Solving the skilled labor shortage will take a village of FM professionals dedicated to tackling this problem. Working with GWI advisors and partners, educational institutions, government agencies, economic and workforce development groups, veterans' organizations, and, most importantly, IFMA members, chapters, communities and councils, we can all be that village that provides new approaches to tackle the talent problem. Together, we can ensure there are skilled FM



workers today and in the future. **FMJ**

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Devin Shackelford,
Construction Management/FM emphasis, Kennesaw State University, Atlanta, GA

Greater Triangle Chapter's Buck Fisher Scholarship Recipient

"Had it not been for the IFMA Foundation's Scholarship program and Ignite FM! Student Challenge at World Workplace, I would not have the job that I have now. I was fortunate enough to have people from Sodexo witness and judge my Ignite FM! competition presentation. Fortunately, the Sodexo judges were impressed with my skills and abilities and offered me a position as an Operations Support Specialist for their Walgreens portfolio in charge of Computerized Maintenance Management Systems (CMMS)."

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Self-healing Concrete

BRYAN MINEAR VIA UNSPLASH

BY DR. GURRAM GOPAL AND MARIA PEREZ-COCA LOPEZ

Smart materials have been in the spotlight with increased interest in the journey toward more sustainable facilities. This class of materials could be of great interest for cities like Chicago that experience extreme weather conditions. Asphalt and concrete in the city's infrastructure suffer from freeze-thaw damage and require frequent, costly repairs. The City of Chicago spends around US\$200 million every year in repaving roads and sidewalks that are damaged during the winter, according to the Chicago Department of Transportation.

Smart materials could help build longer-lasting infrastructure with potentially large savings for cities and nations. Self-healing bio-concrete (or self-healing concrete), first developed by Henk Jonkers and Eric Schlangen at Delft University of Technology in the Netherlands, includes in its composition a type of bacteria that refills cracks with new concrete, closing them and thus repairing the damaged surface.

CONVENTIONAL CONCRETE

Concrete is the most widely used construction material today. Romans started using concrete for their enduring architectural wonders around 200 BCE. Cement is manufactured from a variety of ingredients, including limestone and clay. The ingredients are finely ground and mixed and heated in a rotating kiln at a high temperature (up to 3,000 degrees Fahrenheit). The raw feed chemically changes to produce a pellet-sized product called clinker. The clinker, with a small quantity of gypsum, is then ground to a very fine powder called Portland Cement or cement. When cement and water are mixed, a crystallization process occurs. Then aggregates (sand and gravel) are added, and the hardening reaction binds the mix into concrete.

Admixtures are chemicals added to the mix to achieve special purposes. For example, to increase workability at the same water content, or to change the setting time or to compensate for the shrinkage

of concrete when it hardens. They can also increase strength, improve resistance to freeze-thaw damage, reduce permeability and inhibit corrosion of steel reinforcement. For example, retarders can temporarily prevent hydration from taking place, slowing the reaction and allowing the concrete to be workable during the placing process. To help infrastructure resist freeze-thaw damage, "air entraining" admixtures are commonly used to stabilize air bubbles created during mixing. This provides space for water to expand and contract, increases the resistance of concrete to freeze-thaw damage and avoids premature cracking.

ENVIRONMENTAL CONCERNS

More than 10 billion tons of concrete are produced worldwide each year, requiring vast amounts of natural resources. In the United States alone, 84 million tons of cement were produced in 2017, according to a United States Geological Survey report. The production of one ton of Portland cement releases approximately one ton of into the atmosphere, and the world production of cement accounts for seven percent of the world's carbon dioxide emissions every year. Concrete use is expected to soar because of building booms in developing countries such as China, which consumed more cement from 2011 to 2013 than the quantity used in the United States in the entire 20th century (Washington Post, 2015).

Cement production is also energy intensive, requiring about four Giga Joules per ton despite improvements in energy efficiency. The concrete industry also uses about one billion cubic meters of water each year worldwide, an enormous quantity that can be a particular burden in locations where water is not abundant. Finally, the demolition and disposal of concrete structures has a negative impact as recycling the construction debris is difficult and contributes significantly to landfilled solid waste.

CONCRETE CRACKS

While concrete can handle significant compressive loads, its tensile and flexural load carrying capacity is limited. Application of tensile loads, expansion and contraction, freeze-thaw damage or deterioration of the steel reinforcement can cause concrete to crack. Cracks can appear because of the shrinkage experienced when water not used for hydration gradually evaporates from the hardened mix. Concrete can also undergo volume changes due to thermal effects, and this expansion and contraction can lead to cracks.

Freeze-and-thaw cycles leave cracks in concrete roads, and when salt is spread to defer ice formation, it enters the concrete and damages the steel reinforcement. Some cold-climate cities are beginning to use sand instead of salt to avoid this problem. Cracks can result in problems such as water leakage, frost damage and reinforcement corrosion. Repairing concrete, in addition to being costly, causes significant inconvenience to residents. Construction-related traffic congestion affects people's everyday lives. Are there longer-lasting alternatives to traditional concrete that construction and facility managers can use?

SELF-HEALING BIO-CONCRETE

Traditional concrete has always been produced with inert materials. However, "self-healing bio-concrete" changes this paradigm. Inspired by biology, this concrete is made of "living materials" and can heal itself, like trees or human skin. It can autonomously repair itself after crack formation, with no or limited human intervention, and that can dramatically reduce maintenance and repair costs. This product is a sustainable solution that improves the lifespan of buildings, bridges and roads.

The concept of self-healing concrete was first developed by Carolyn Dry, an architecture professor at the Universi-

ty of Illinois, Urbana-Champaign, in the early 1990s. Now, it appears that the first commercial products are in sight. Microbiologist Hendrik M. Jonkers developed a "self-healing concrete containing bacteria" that earned him the European Inventor Award 2015. Subsequently, more healing products based on bacteria and fungi have been developed, including a repair mortar for patching cracked concrete and a liquid-based repair system that can be sprayed to seal cracks that have already occurred in traditional concrete structures.

HOW DOES SELF-HEALING WORK?

Self-healing concrete introduces a healing agent into the concrete mixture as another type of aggregate. The healing agent consists of three components: the active organism (bacteria or fungi) that acts as a catalyst, a mineral that acts as "food" for the organism and capsules that are containers. The capsules need to survive the mixing and casting of the concrete and should remain intact until the organisms' action is needed to close the cracks. Spores of limestone-producing bacteria like *Bacillus pseudofirmus*, which are alkali-resistant, are well adapted for concrete applications. They produce endospores with low metabolic activity, are able to resist high mechanically and chemically induced stresses and can remain dormant for up to 200 years inside the concrete.

When concrete cracks and water and air reach the capsules, the environmental conditions are favorable for the spores to germinate and grow into active bacterial cells. The bacteria then feed on the calcium lactate and form limestone, sealing the cracks. This healing happens in just three weeks. Calcium lactate is "food" for the bacteria and does not affect the material properties when mixed in the concrete. Biodegradable plastic is used for the capsules as it has to be strong enough to survive the mixing phase while bonding well with the surrounding hydrated cement paste. It is also able to break when cracks form to release the bacteria and nutrients. In addition, the capsules need to be inert to the chemicals and additives in concrete and to the healing material they are carrying. This has been achieved by the immobilization of the bacterial spores and the calcium lactate in expanded biodegradable plastic particles. They represent a structural element of the concrete and a protective matrix for the self-healing agent.

Current self-healing bio-concrete has proved to be able to close cracks up to any length, provided they have a width of 0.03 inches or less, according to the European Patent Office. Research efforts are underway to increase the width, which enables more opportunities for application.

Apart from cracks, there is another important surface flaw in concrete called "scaling degradation," which results in "spalling." This appears during freeze/thaw cycles in the presence of de-icing salts. Test results showed 50 percent less scaling with the self-healing concrete compared to untreated samples. Like concrete, self-healing bio-concrete is non-flammable and non-explosive. By making concrete more long-lasting, the need for cement is reduced.

BIO-CONCRETE CHALLENGES

It is difficult to change the mindset of contractors who have worked for years with regular concrete. It might be hard to convince companies to invest in self-healing bio-concrete as they might anticipate more expenses for material, installation and maintenance. However, self-healing materials can be added as another aggregate in the concrete mix. Companies can proceed as if it were traditional concrete.

Self-healing bio-concrete currently has a production cost that is almost twice that of regular concrete. This is driven by the calcium lactate nutrient for the bacteria (European Patent Office). Active research is underway to develop alternative nutrients that would reduce the cost to a level closer to regular concrete, between US\$100 and US\$120 per cubic meter. However, concrete often accounts for only a small percent of the total cost of construction projects. The higher initial cost of self-healing materials can be recovered in three to four years.

CHICAGO

The majority of Chicago's roads are made of composite pavement, which consists of different layers of materials bonded together: a top asphalt layer, a Portland cement concrete base, a coarse aggregate base and the natural subsoil (Kaiser, 2016). The main challenge with these streets is the surface layer cracks during the winter because of freeze-thaw damage. Due to extreme weather conditions, Chicago has a paving season that starts in the spring as soon as temperatures allow construction work.

In fiscal year 2014, the city budgeted US\$276,272,834 for street maintenance

activities. Resurfacing and reconstruction accounted for 90 percent of those funds and pothole filling was the rest. A Chicago Sun-Times analysis stated potholes are a real issue, as complaints rose 14 percent in the first two months of 2018 compared to the same period the previous year. In 2013, the city paid an estimated US\$181,217 on 754 damage claims, or about US\$240 a claim. However, the estimated damage to vehicles due to potholes averages over US\$300 per vehicle per year.


CAN BIO-CONCRETE HELP?

Self-healing bio-concrete seems perfect for residential streets, allowing a longer service life and avoiding problems with potholes. Models using National Ready Mixed Concrete Association (NRMCA) and CDOT data, along with reasonable assumptions, suggest an initial investment of nearly US\$2.5 billion is needed to pave 4,000 miles of Chicago's residential streets with self-healing bio-concrete. This can be divided into a multi-year program.

As the city needs less repair and maintenance activities, construction work will be

reduced, and this will save time and frustration for citizens. A 50 percent decrease in construction-related delays can save citizens more than US\$600 million in estimated time value of money. In addition, self-healing bio-concrete would reduce the transportation of asphalt needed for repairs and save about 1.20 billion gallons of diesel fuel nationally and reduce emissions by an estimated 13.8 million tons each year.

A SUSTAINABLE FUTURE

Smart, self-healing construction materials open a variety of paths toward sustainable construction and maintenance of facilities. Volume production of these materials is in the near future, and more applications can drive costs down and fund further research. It is time for the public and private facility owners and managers to move from conventional techniques and invest in materials that are better for the environment and have lower operating expenses. These forward-looking industry professionals can then tell the roads and other facilities, in all seriousness, to "heal thyself." 



Dr. Gurram Gopal is an industry professor in industrial technology and management at Illinois Institute of Technology with a keen interest in sustainability and corporate social responsibility. He has published more than 50 papers and articles and has presented extensively at academic conferences. In 2011-12, he received a Fulbright Scholar Award to teach and conduct research at Galway Mayo Institute of Technology in Ireland, and is a Fulbright Specialist candidate from 2013 to 2018. During his career in industry and in academia he has been actively involved in LEED projects and has worked with students to create innovative programs on sustainability using LEED-certified facilities.



Maria Perez-Coca Lopez has a master's degree in Industrial Engineering from the Polytechnical University of Madrid and a master's in Industrial Technology and Operations from Illinois Institute of Technology. Her fondness for architecture and keen interest in new materials led her to investigate how cities can evolve into a more sustainable future.



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The IoT of Clean

Most of us believe that the Internet of things (IoT) is relatively new. In reality, IoT dates back to the late 1960s. That is when “things” were first connected to other “things,” which usually conveyed information to people using wires and cords.

Today, those early objects have been replaced with smart or connected devices. Often, they use sensors to collect data and then transfer that data wirelessly to information centers, or in our case, to facility managers and cleaning professionals. Further, this communication is no longer a one-way street. Managers and cleaning professionals can communicate with smart devices when and as necessary.

It might seem unusual that we mention the professional cleaning industry in a discussion of IoT. After all, the industry has a history of not being all that tech-savvy. However, in the past decade or more, that has changed. IoT, along with other technologies, are starting to play a very significant role in the professional cleaning industry.

The good thing about this, for both facility managers and the professional cleaning industry, is that it brings with it many benefits that can help improve cleaning effectiveness, increase worker productivity and reduce costs.

Here’s a straightforward example: a multi-tenant office building was having an ongoing problem with trash collection on certain days and on certain floors in the building. Trash would begin to overflow in these areas, becoming unsightly, causing odors and resulting in ongoing calls to the management office asking for help.

An IoT system was installed to monitor the situation. The system could tell when trash cans became full and gave managers and day porters in the building a notification long before the tenants called the facility management office for assistance.

Further, the IoT system looked at the big picture. It found that the trash containers on certain floors filled up quickest on Monday and Wednesday, whereas the other days of the week presented less of a problem. This information was also relayed to managers and day porters, so they could more proactively handle the situation. Complaints from tenants quickly decreased.

BY ROBERT KRAVITZ

Connected cleaning equipment

It's 10 p.m. and a cleaning worker wants to know where a specific floor cleaning machine is in a building. Instead of calling other custodians, she can find out in seconds where the machine is, if it is being used (and even if it is being used properly) merely by going to a computer screen or a smartphone.

While she's there, the worker can also learn how many hours the machine has been used over its lifetime. This allows for predictive maintenance. If it is time for the machine to be serviced, maintenance can be performed now, which prevents a costlier service call and downtime down the road.

How does this work? A manufacturer-installed module inside the equipment collects data indicating where the machine is located and its use. That data is instantly transmitted to a cloud-based portal then converted into insights that can be read on a computer or smartphone. It's fast, easy to use and it can be a money saver.

Robotic floorcare

Floorcare equipment that can clean and scrub floors on its own may prove to be one of the most labor- and cost-saving benefits of IoT. And fortunately, it's already here. Different manufacturers are now introducing floor machines that can be "taught" how to clean floors. In addition to programming capabilities, these machines have sensors. So, if one day, for instance, there is a box or a table in a floor area that was not there before, the machine can clean around the object.

Putting IoT floor machines to work allows cleaning professionals to spend more time performing other cleaning tasks. Duties that in the past would have been placed on the backburner can be attended to when needed, helping to keep the facility cleaner and healthier.

Smart restrooms

IoT has already given us smart homes with systems that can control thermostats, lights, security systems and appliances. Now it can provide facility managers with smart restrooms. One task IoT systems are already helping managers and cleaning professionals with is monitoring supplies — referred to as the fullness status — of paper, soap and other products. And, as discussed earlier, trash levels are monitored.

Not only can the system communicate when supplies are running low, but it can also help provide insight as to when supplies are most likely to run out and in

which restrooms, so they can be refilled long before that happens. Systems can also indicate if dispensers are broken or not working properly.

Furthermore, IoT systems can provide information as to the busiest times for different restrooms. This way, cleaning professionals know that certain restrooms in the facility may need cleaning attention after the morning rush, while others don't need service until after lunch.

Real-time Communication

IoT is not the only new technology making inroads in the professional cleaning industry. Another example is communication between facility managers and cleaning professionals.

Ron Segura oversaw the cleaning operations of more than 4.5 million square feet for The Walt Disney Company and is now a cleaning consultant for facility managers and cleaning contractors. He says that in the past a facility manager might leave a note for the cleaning crew on their desk at the end of the day, alerting the crew to something in the facility needing cleaning attention.

All too often, the next morning the manager would find the note where they left it. Neither the contractor nor staff saw the note, meaning the issue was not addressed.

"I call this a 'hit-or-miss communication system' [that] did not work in the past and certainly will not work today when instant communication is the norm," Segura says.

New technologies address this problem by communicating directly with cleaning crew supervisors. As an example, Segura says he advised one of his large cleaning contractor clients to equip all its staff with smartphones to receive and relay information.

"Now, when the manager tells the supervisor about a problem, the cleaning supervisor can send before-and-after images of the situation, how things looked before attention and then again after it was addressed. This is real-time problem handling, which is what today's facility manager not only wants but expects," he says.

Imaging Technology

In the past, when managers and cleaning professionals wanted to scientifically evaluate cleaning effectiveness and uncover areas of a facility that may need increased cleaning attention, they turned to ATP (adenosine triphosphate) meters. These provided a reading that indicated how much ATP was on a surface. The more ATP on a surface, the brighter the red flag that

What is ATP?

Adenosine triphosphate (ATP) is an energy-bearing molecule found in all living cells. It was discovered by scientists in Germany and the United States in 1929, and is considered a sign of life. If ATP is detected on a surface, it means living cells are present. A high level of ATP — a reading of 500 or more — would be a serious cause for concern.

the surface needed cleaning attention.

While ATP systems are still used in the professional cleaning industry, new studies indicate they are not always reliable. A new tool, referred to as imaging technology, is replacing the ATP system and proving more dependable and effective.

According to Brad Evans with Opti-Solve, which offers imaging technology, these systems analyze the actual surfaces. They then create images indicating where microbes are present or not present on a surface and in what density or amount.

"We should view imaging technology as both an indicator and an assessment tool," he says. "It indicates if and where pathogens are located, telling managers and cleaning professionals where cleaning is needed."

As an assessment tool, Evans says imaging technology is able to assess cleaning performance. "This way managers can proactively validate that the money they are investing in cleaning is being delivered."

The Future

IoT and similar new technologies are likely to prove very beneficial to both facility managers and cleaning professionals as technologies continue to develop and evolve. As to the future, we can expect the advent of more new technologies designed to improve cleaning effectiveness and performance and, along with it, worker productivity. These technologies are also likely to help make facilities greener and promote sustainability, all of which make the future look brighter for facility managers. FMJ



Robert Kravitz is a former building service contractor and the author of two books on the professional cleaning industry. He now writes for the professional cleaning and building industries.



KEEPING WATCH

HOW
TO
MANAGE
VISITOR
SECURITY
RISKS

BY CAMERON WIEBE

This is easier said than done. If the only visitor management solution in place is a paper log book, someone must manually check the names in the log against another list of invitees. Even then, the person checking the names must assume that whoever signed the book was both honest and accurate when they filled it in. Of course, with a system like that, it's difficult to understand what exactly would warn a facility manager of a potential breach in the first place. Leaving that point aside, the thought of one person trying to manually run a single name against numerous invitee and security watchlists is both frightening and funny.

In spite of this, market research shows that 25 percent of organizations still use a paper log book. For the rest of us, there are digital tools that do a much better job. In recent years, cloud-based visitor management systems (VMS) have evolved that can alert FMs to a variety of threats such as the presence of unauthorized visitors. That's only the beginning, though. Knowing about a threat is important, but what if there were a way to prevent the threat from entering a facility in the first place?

What good is the knowledge of an approaching storm without also knowing when it's coming and how to prepare? Does the situation call for boarding up the windows, a full evacuation or simply closing the windows? It's good to know early on that a child is struggling with math, but only if that information comes with strategies that will ensure a better grade next time around. Being aware of that 20 pounds of quickly thawing, soon-to-be rancid hamburger meat in a malfunctioning freezer is only useful information if it comes with a plan of action (likely an impromptu barbecue).

Maintain Operational Integrity

Maintaining operational integrity is about controlling which people have access to which parts of a facility. It sounds simple enough, but given the size and complexity of many facilities, the task is no easy feat. Facility managers can use a VMS to efficiently and effectively preserve the security of their facilities, no matter how many entrances, buildings or campuses those facilities have. Maintaining the operational integrity of a site always starts with

information. As a case in point, 89 percent of people who use a VMS say it provides valuable data and insight. However, VMS has progressed beyond simply identifying threats once they are present. They can now help prevent or neutralize those threats before they become a serious problem. This is accomplished in several ways.

The first set of solutions that visitor management can provide is what we might call "soft" controls. They shape the visitor experience in a way that encourages guests to more or less automatically follow the correct security protocols because it is the most convenient thing to do. These controls are surprisingly effective. Research shows that 93 percent of VMS users say that it increases efficiency and a third report at least a 40 percent reduction in check-in times. Greater speed and efficiency don't only mean a more pleasant experience; they suggest that visitors are more willingly (if unconsciously) complying with security protocols.

The process starts when a host sends an email invitation to a potential visitor, providing them with all the vital information for their visit, including where to park,

which entrance to use, etc. Administrators start shaping the visitor experience the second a meeting is scheduled, guiding visitors toward the place they belong and away from the places they do not. However, from the visitor's perspective, it's all a matter of convenience.

Once guests arrive at the lobby, a tablet-based sign-in protocol is becoming the new norm. This typically includes checking in with an email address or name, signing NDAs and other legal documents, reading or viewing safety briefs, and taking a picture for a customized security badge. While the visitor completes these tasks, the host is notified. This creates a seamless experience that never leaves the visitor alone to wander; and it makes the host accountable for guiding the guest through the facility until it's time to see them out.

Set a Watchlist

Recent innovations in visitor management technology provide organizations with a golden opportunity to take security to the next level by screening visitors against watchlists. This is an instantaneous process that should be invisible to the visitor. Ideally, visitors would be screened against several different watchlists at once. Some watchlists are created by third parties and might include individuals on no-fly lists or other categories of potentially dangerous visitors. At the same time, many organizations create customized watchlists based on their own experiences with previous visitors (or shared information with colleagues and partners). Clearly, a watchlist screening procedure that takes both kinds of lists into account will be much more effective. If the system flags a watchlisted visitor, security personnel and the host are immediately notified of the threat.

At this point a facility manager might think, "That's all well and good, but isn't a watchlist feature a bit like getting the bad report card without a way to improve the grade?" It's helpful to know when a security risk shows up — clearly, it's better than not knowing — but surely it would be even better to stop those people from gaining access in the first place.

Proactive Assisted Check-In

Companies have been grappling with these questions, which is why many of them want to introduce what some could call "hard" controls. These go beyond simply identifying threats, instead enabling facil-

ities and security staff to work together to physically prevent security risks from entering a facility.

Many organizations are starting to understand that the self-check-in process, whether it's done on paper or a tablet, can only do so much to mitigate security breaches and safety risks. With this in mind, one hard control that some companies employ is an assisted check-in process that allows security personnel to use high-quality ID-scanners to verify government-issued IDs while screening visitors against any combination of watchlists.

Processes like these provide new levels of safety and efficiency. It's much better to identify security risks at an external security booth or parking kiosk that is physically distant from a site's buildings. Additionally, with a security guard present during the process, it is virtually impossible for an unwelcome visitor to sneak into a facility undetected.

Because assisted check-in processes rely on ID scanners to verify government-issued IDs, facility managers can be much more certain that every visitor is exactly who they claim to be. The same is not true of systems that rely on visitors typing their email addresses or names into a tablet, which amounts to relying on the honor system. The ID scanning process is also much faster than the self-check-in process, which makes it ideal for high-traffic access points like parking gates or busy lobbies.

Digital Hands Make Light Work

Beyond the immediate safety concerns associated with visitors, FMs need to pull every aspect of visitor management together into a more seamless and integrated experience for everyone involved. Many large organizations must meet strict compliance requirements from many regulatory bodies. With the old paper log book approach, an audit from any one of those bodies would involve a massive amount of human labor (to say nothing of human error).

However, by setting up a VMS to collect the appropriate data for each visitor as they arrive at the facility, FMs can always make their organizations audit-ready with no additional work. This is just one reason 78 percent of VMS users say that it provides them with more information about their guests.

So much talk about security threats can make the world of visitor management seem quite serious. While it's true that se-

curity considerations loom large for many VMS users (89 percent of VMS users believe it creates a safer environment), VMS is also a great tool for celebrating guests who are welcome at the organization. The same tools that help identify and neutralize potential threats are also excellent ways to recognize, welcome and celebrate valued guests.

Watchlists, for example, can also flag special guests, VIPs or any other category of visitor, making it easy to ensure that they are remembered and welcomed. Instant notifications can remind hosts of a guest's biographical information or their favorite drink. After signing in with a security guard, a VMS can guide visitors to the appropriate parking stall and building with SMS or email notifications, or even wayfinding technology, making sure that every person who arrives at a facility knows exactly where to go.

Facility managers face an endless list of tasks; and while that list will likely never get shorter, advances in technology make it possible to do more in less time. Visitor management technology has already moved beyond simply alerting administrators to potential security threats to giving them tools with which to neutralize many of those threats before they can gain access to a site. It seems inevitable that before long, VMS will allow FMs to guide, protect and monitor visitors (and others) through every point of interaction between people and facilities. Who doesn't want to avoid a storm instead of weathering it, or pull up that math grade before the dreaded report card arrives? Facility managers can now expect technology to go beyond responding to danger and start preventing it. FMJ

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Cameron Wiebe is the CTO of **Traction Guest**, a leading cloud-based Visitor Management

System. Cameron's strong technical background as well as his creativity and thirst for innovation has guided the product vision from the beginning. As the architect of Traction Guest, he is constantly building new solutions that push the frontier of what visitor management can achieve in the realm of security.

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The first of its kind in the U.S., the We Print Houses 3D home printing system includes a mobile platform and all corresponding mechanical systems needed to construct a 3D-printed home. With the precision and speed of robotic “ink-jet” technology – and without the common pitfalls of traditional home building – the system produces complex design-driven homes faster, stronger and smarter. Houses are “printed” with hydrophobic, self-binding geopolymer cement.

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In addition to the complete mobile 3D concrete printing system, licensees will receive on-site training at Genesis, the first home in the U.S. to be designed, engineered, permitted, built, appraised and sold using this technology. Genesis construction was set to begin in Lago Vista, Texas, in February.

lower maintenance costs, the concrete homes are designed to meet International Building Code and feature disaster-resistant details such as curved walls and buttressed ends. The homes are built to withstand fire, hurricane- and tornadic-force winds, 8.0+ earthquakes, hail and flooding.

The first 25 licensees will be eligible for a one-year, territory-exclusive

license to the We Print Houses system. Following a two-week training and certification program, licensees are included in the We Print Houses marketplace, connecting qualified builders and prospective home buyers.

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GRC’s liquid-cooled server racks are at work across the globe within some of the world’s largest cloud, enterprise, government, education and telecom organizations.

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Designed for hotels, offices and public venues, Skylight's cloud-based platform has built-in artificial intelligence and machine learning – the more information it gathers, the smarter the building becomes. Skylight buildings can warn for potential problems, adapt to place conditions like occupancy changes or an emergency event, and talk with building occupants via its voice-based assistant “Carl.”

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As a cloud-based SaaS platform, Skylight does not require any IT infrastructure. It's built on the Amazon Web Services platform so it can provide an expanding ecosystem of plug-and-play ready devices, apps and third-party solutions from IoT sensors and remote data feeds, to dashboards, management tools and ready-to-use analytics. Visit Site 1001 for a free evaluation of your building's health and performance.

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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."

Q A quickly growing technology company has purchased a 150,000 square foot (13,935 square meter) building that will serve as their corporate headquarters. James has just been hired as the facility manager and will need to build the FM organization from the ground up. One of the organization's key strategic objectives is that every department is expected to implement best practices to enhance the organization's triple bottom line. What advice would you give James to help him get started to meet this strategy through quality operations and maintenance practices?

A The triple bottom line for this discussion is identified as three dimensions: profit, people and planet. From the quality operations standpoint, it is recommended that James identify an appropriate and relevant quality management framework. We recommend the International Standards Organization (ISO) because it is a recognized and respected organization for advancing and managing quality. ISO-14000 is for environmental management practice, quality policy and quality management system.

TRIPLE BOTTOM LINE

Profit Centers — Financial

Once the quality framework is established, the necessary workflows can be created, quantified and monetized to ensure that there is transparency and linkage between costs and effort. By operating within strict cost parameters, profitability becomes more realistic.

People — Social

James will need to ensure that the people decisions align and reflect the organization's quality policy. Talent and community are critical elements in satisfying the people factor. As the talent dimension is addressed, James and his management team will be responsible for creating a culture that promotes workplace dynamics characterized by collaboration, esprit de corps (good working relationships) and quality of work life. The result of creating these cultural elements is greater employee retention and a reputation of being an employer of choice.

Planet — Environment/Community

It is imperative that James uses "smart green practices" to promote a sensitivity to the environment. Specifically, James needs to ensure the workplace is compliant with the necessary Occupational Safety and Health Administration regulations. As mentioned above, create an environmental management framework around ISO-14000. The result of implementing these actions will be a measurable contribution to preserving the environment and its natural resources. An added benefit is the creation of a narrative to the stakeholders that James is socially and environmentally conscious (engaged) in promoting well-being of the planet.

Daniel Goldsmith, DBA

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Questions regarding the Ask the Experts section?

Mark Sekula

IFMA Fellow, CFM, FMP, LEED AP

President of Facility Futures, Inc.

msekula1@wi.rr.com

A To James: You met the principals a month ago. The architect took you to the site and acquainted you with renovation plans, activities and her impressions of company leaders and culture. She has worked with the company for about six months and promoted the triple bottom line objective. Buildout is well underway. Contractor incentives focus on occupancy a month from now.

It is Monday of your first week in the old, crowded, location. Meet HR. Find a nook that's central, but not in the way. You want everyone to recognize you, especially for other department heads to perceive you as interested, involved, connected, supportive, accessible, competent and essential.

Call your favorite change management and move consultants. Get a strong communicator with technology growth companies to meet with the COO and department heads and take care of the move. Is commissioning planned yet? It should be. More phone calls. For core O&M staff: outsource, or in-house? Engage the maintenance lead to interface with the move and commissioning consultants.

Set out and align O&M social, environmental and financial goals, strategies, and initiatives that play well with organization culture and top management expectations. Be ready to support the needs of other departments. Visit department heads and see if and how the triple bottom line strategy has cascaded to them and their staffs.

Start to detail O&M and a CFO-friendly budget. Communicate FM by learning and listening. Build a responsive O&M operation that measures, reports its performance and improves.

David Reynolds, CFM

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A: Operationalizing a new facility is a stressful and hectic time for facility managers. Developing an FM strategic plan requires alignment with corporate culture and business strategies built on insight gained from talks with senior management, end-users and other FM stakeholders.

An approach that can be used to develop O&M strategic plans focuses on service delivery and their impact on people, profit, and planet.

PEOPLE

Diversity

Increased workforce mobility results in more diverse workforce and service expectations. FMs are going to have to use a wider array of tools and services to meet these changing needs.

Workspace Management

Future generations want more flexible working patterns and work freedom, and an environment that enables collaboration and innovation whenever and wherever.

Well-being

Strategies to enhance human health and wellbeing are critical to improving the employee experience while attracting top talent. Bright, innovative buildings with open co-working spaces, plenty of amenities and fresh food options are becoming the norm within the tech industry.

Employee Experience

As FMs assemble their team, it's important to find a good balance between hard and soft skills. Businesses increasingly focus on work efficiency and workplace experience to reduce employee turnover and improve bottom line results. Hospitality-focused training is gaining ground due to the positive impact it's having on the employee experience.

PROFIT

Preventive Maintenance

Advanced hardware and software technologies are available to FMs to better serve their preventative maintenance work as they can be more proactive and transition to more cost-efficient predictive maintenance techniques.

Internet-of-Things (IoT)

Smart buildings (IoT and Artificial Intelligence) provide safer, more comfortable environments while reducing equipment failures and disruptions to employees. FMs can use IoT data to optimize preventive maintenance schedules, thus reducing maintenance cost and extending asset life.

Visit FMCC online or join the conversation on the council's LinkedIn group

—
fmcc.ifma.org or <http://linkd.in/1gAa8ae>

Lower Cost of Delivery

FMs are constantly challenged to save money and improve efficiencies. Intelligent solutions, such as communication sensors, security applications and smarter robots with more automation are tools to help FMs achieve these goals.

PLANET

Sustainable Practices

Well-managed sustainability strategies yield cost savings, healthier and more productive work environments. Engage subject matter experts (SMEs) to develop these practices as they can provide industry best practices across all corporate services.

Energy Management

IoT technology allows FMs to go beyond traditional building management systems to manage energy usage (lighting, HVAC and more) in their facilities. Utilizing IoT, FMs can collect, analyze and translate energy data into more educated, actionable decisions to further improve energy efficiency and employee comfort.

James is unlikely to have unlimited resources to pursue all the options outlined. However, using this approach he should have a good O&M roadmap as to where he aims to go

Skender Rugova, CPM®, RPA®

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Components in Focus

IFMA UK CHAPTER PARTNERS WITH THE FACILITIES EVENT 2019

The International Facility Management Association (IFMA) UK chapter has embarked on a partnership with The Facilities Event for the next edition of the show which returns on the 9th-11th April at the National Exhibition Centre, Birmingham, UK.

At The Facilities Event 2019, the IFMA UK chapter will have its own stand to showcase the opportunities and resources available to members. The chapter will also be running networking events during the show. Members of the IFMA UK chapter will be invited to take part in the event's CPD professional seminar program.

Rachel Godfrey, Event Manager, The Facilities Event says, "We are very proud to be partnering with the IFMA UK Chapter. The organization's mission to 'Empower Facility Professionals Worldwide' aligns perfectly with our continuing vision to become a three-day home for the UK's FM and workplace sector."

Dave Wilson, one of the IFMA UK chapter directors, says, "The Facilities Event is the UK's leading exhibition within the FM industry, and one we were eager to support. We look forward to seeing our members there."

Want to share your member or component news?

Reach out and share your chapter news with other members and FMJ readers. Send details and photos (if available) to jocelyn.kerr@ifma.org with the subject line: Components in Focus. We look forward to featuring your chapter in an upcoming issue!



REBECCA JOHNSON

Workplace strategist Rebecca Johnson spent ten years on the owner side of facility management before moving to an advisor role. She helps her clients develop strategies specific to their organizational goals and serves as a change agent guiding them through workplace transformations. Based in St. Louis, Missouri, facility management appeals to her puzzle-solving nature because each day is like piecing together a giant puzzle. Connect with Rebecca at [linkedin.com/in/rebeccajohnson](https://www.linkedin.com/in/rebeccajohnson).

I have snorkeled the Great Barrier Reef, where I swam with sea turtles, sea cucumbers and all the other amazing sea life – like straight out of Finding Nemo!



ROGER CHATELAIN

Just west of Baton Rouge, Louisiana, Roger Chatelain is chief engineer with Gateway Facility Services. The facility is a research lab with office space on the Louisiana State University campus. Facility management was a natural progression from his work in construction and renovation. He earned his HVAC certification and safety certifications, which help with the daily issues he faces as an FM. He's worked in the industry for 13 years.

I am a hunter and was on my second turkey hunt back in 2002 when my cousin called in three jakes (young turkeys). As they came up from a small hill they lined up directly in front of me at about 30 yards one behind the other, although I did not see the other two right away. I shot the first turkey only to stand up and see two on the ground and the third trying to fly away (which my cousin's son then shot). One shot: two down and one wounded.



SABRINA BIANCANIELLO

Corporate facilities manager Sabrina Biancanello has been in the FM industry for 13 years and is currently based out of Astoria, Queens, New York. She chose facility management as a career because it was a great opportunity to connect with facilities professionals.

I love DIY projects – HGTV really helps!



SCOTT BUMBALOUGH

Facility management newcomer Scott Bumbalough became a facilities technician a year ago. During a period of unemployment, someone suggested the job because the schedule would give him time to spend with his family on the weekends. Once hired, he became very interested in the work and decided to make FM his career and not just a job. Based in Huntsville, Alabama, he works in a corporate facility.

I'm an introvert, so I'm that fun. I stay quiet in group settings and just listen and observe. Not really the life of the party that is for sure, most of the time you really wouldn't know I am there, though I like it that way.

AMERICAN CITIES CLIMATE CHALLENGE

25 LEADERS FOR

A SUSTAINABLE

FUTURE



CONTRIBUTED BY IFMA'S ENVIRONMENTAL STEWARDSHIP, UTILITIES AND SUSTAINABILITY COMMUNITY STRATEGIC ADVISORY GROUP

In June 2017, President Trump made the highly contested decision to withdraw the United States from the landmark Paris Climate Agreement. This was met with an astounding reaction from politicians at the local and state level, CEOs of large companies, leaders of non-profits across sectors and individuals across the country. The “We Are Still In” declaration and coalition, a bipartisan organization coordinated by many of the world’s leading business and sustainability-related groups, gained signed commitments from 281 cities and 2,161 businesses and investors stating they will do their part to achieving the standards set in the Paris Climate Agreement. The International Facility Management Association (IFMA) signed the agreement in 2018.

Additionally, companies have signed on to “America’s Pledge,” promising to contribute data to climate action, communicate results and catalyze further climate action in the near term. The demand for climate action across the country has never been clearer.

Most of these cities, states, companies and organizations were already working on efforts to combat climate change. However, in June 2018, one year following the country’s withdrawal, Bloomberg Philanthropies upped the ante, announcing the American Cities Climate Challenge. This US\$70 million, two-year acceleration program is designed to support ambitious U.S. cities’ efforts to tackle climate change and promote a sustainable future for their residents.

After a rigorous application and selection process, 25 cities were selected to participate in the Climate Challenge. They will be tackling head on energy efficiency in buildings, renewable energy, mobility, and electric vehicles at the local level.

Together, these cities have committed to work on local actions that are anticipated to reduce carbon emissions at least 26 to 28 percent from 2005 levels. That equates to at least 40 million metric tons by 2025. Simply put,

All 25 cities committed to work on local actions that collectively are anticipated to reduce carbon emissions from 2005 levels by

26-28%

By 2025, this reduction translates into

40 MILLION METRIC TONS

THE 25 SELECTED CITIES

- | | |
|------------------|----------------------|
| 1. Albuquerque | 14. Orlando |
| 2. Atlanta | 15. Philadelphia |
| 3. Austin | 16. Pittsburgh |
| 4. Boston | 17. Portland |
| 5. Charlotte | 18. Saint Paul |
| 6. Chicago | 19. San Antonio |
| 7. Cincinnati | 20. San Diego |
| 8. Columbus | 21. San Jose |
| 9. Denver | 22. Seattle |
| 10. Honolulu | 23. St. Louis |
| 11. Indianapolis | 24. St. Petersburg |
| 12. Los Angeles | 25. Washington, D.C. |
| 13. Minneapolis | |





this is the same impact as closing 10 coal-fired power plants or removing 8.5 million passenger vehicles off the road for a year. If these cities are successful, they will collectively have done their part to meet the carbon reduction requirements mapped out in the Paris Climate Agreement.

A network of world-class partners is helping the 25 winning cities turn their ambitious goals into reality. The Natural Resources Defense Council (NRDC) and Delivery Associates (DA) will provide strategic guidance, resources and technical support to advance policies and programs aimed at reducing greenhouse gas emissions from buildings and transportation, as well as increasing renewable energy. In addition to NRDC and DA, the cities will be working with several national partners with expertise in areas such as building energy efficiency, renewables, mobility, electric vehicles.

Why is the Climate Challenge focused on buildings and transportation?

According to the Environmental Protection Agency's 2018 Inventory of U.S. Greenhouse Gas Emissions and Sinks, the buildings and transportation sectors are the largest sources of GHG emissions in the United States. Alone, the buildings and transportation sectors are the single largest sources of GHG emissions, and in aggregate, they emit nearly 61 percent of all GHG emissions in the United States. The largest emitter, at 32 percent of U.S. emissions, is the buildings sector. Globally, buildings account for 40 percent of total direct and indirect CO₂ emissions. In many U.S. cities, the carbon emissions from buildings can soar above 70 percent.

Where does the Climate Challenge help?

The Challenge is focused on specific action items cities can implement to reduce GHG emissions in each of these sectors. These action items are not only industry best practices but are also field-tested policies and programs that catalyze market change while being cost effective. Cities will work with teams of national and local experts to implement projects ranging from renewable energy development and energy efficiency policies to electrical vehicle infrastructure deployment and expanded mobility options.

Cities across the nation have already taken bold and ambitious actions on reducing energy use in buildings. For example, in 2017, Salt Lake City created a full-time position in its facilities department dedicated to retuning. The role's primary responsibility was to monitor energy data from all city buildings and perform retuning as necessary. The city funded the position

**“TECHNOLOGICALLY AND
COMMERCIALY VIABLE
SOLUTIONS EXIST, BUT WE
NEED STRONGER POLICIES
AND PARTNERSHIPS TO SCALE
THEM UP MORE RAPIDLY.”**

ERIK SOLHEIM *U.N. Environment Programme Executive Director*

Partnering agencies include:

IMT – Institute for Market Transformation

RMI – Rocky Mountain Institute

WRI – World Resources Institute

NACTO – National Association of City Transportation Officials

USDN – Urban Sustainability Directors Network



WHAT CAN YOU DO?

Cities need the in-depth understanding of barriers to energy efficiency improvements from the facility managers who run the buildings. IFMA chapters and members are encouraged to work with policymakers, utilities and partners to find ways to overcome these barriers and implement industry-proven energy efficiency measures.

Cities are calling on facility managers to act in the following ways:

Join or create a sustainability committee in your IFMA chapter

Meet with city representatives to understand the specific building action items they are pursuing and how IFMA can help

Add to your career by obtaining IFMA's Sustainability Facility Professional® certificate

Benchmark the energy use in your building and identify improvements

Contact your local utility to find ways to implement said improvements

Contact your city to find ways to implement said improvements

along with a utility incentive that provided funding based on energy savings achieved. The incentive program required the retuning agent to work in partnership with the utility to develop sound energy strategies. Through this collaboration, the city saved enough in energy costs across 160,000 square feet of building space to more than fund the full-time position within the first year, as well as expand the work by certifying one of their facility managers in building operation recommissioning.

This is just one of many examples of good building management practices. Actions like this demonstrate both to the public and the building community that energy efficiency and climate mitigation are not only good social practices but are sound business moves. The Climate Challenge hopes to build on these great examples by using these practices as templates and expanding this knowledge to the rest of the nation.

What's down the pipeline?

Over the next two years the Climate Challenge will help its 25 cities accelerate building energy policies and programs, including, but not limited to, financing programs, energy code enhancement, workforce development, energy benchmarking and building performance standards.

Energy experts know that true impact rarely happens within one organization alone. Municipalities partner with local organizations to create lasting change and realize true energy savings. Facility managers are the boots on the ground, maintaining and operating the equipment needed to make the business run. They are also the ones who hold the key to further energy savings. Without the expertise and skillset of facility managers, actual energy reductions aren't realized at the building level.

Facility managers have, for decades, ensured that all businesses meet production deadlines, that office spaces are comfortable, and that HVAC equipment are maintained. Let's continue to improve our facilities and find ways to contribute to our community. 

RESOURCES

1. American Cities Climate Challenge: www.bloomberg.org/program/environment/climatechallenge/
2. Inventory of U.S. Greenhouse Gas Emissions and Sinks: www.epa.gov/sites/production/files/2018-01/documents/2018_complete_report.pdf
3. Sustainability Facility Professional® FAQ: www.fm.training/credentials/sfp



Hilary Firestone is the Buildings & Energy Technical Strategist for the American Cities Climate Challenge, a national initiative to empower and support U.S. cities to meet their carbon reduction goals. Hilary has over a decade of experience working on local energy efficiency policy. She served as a Senior Policy Advisor in both the New York City and Los Angeles Mayor's Offices, where she helped develop and implement comprehensive strategies to reduce energy and water consumption in the cities' existing buildings.

Heber Springs Cafeteria Remodel

Heber Springs, Arkansas

Architect

Jackson Brown Palculict Architects, Inc.



Photos Courtesy of Sitter & Henry, Inc. & JBP Architects

The Heber Springs High School Cafeteria was part of a combination of assignments listed on the District's millage campaign.

One of the reasons that JBP Architects was hired as the design professional was because of the firm's ability to help school districts compile and present information to the public in order to pass millage campaigns and appropriate funds for public projects.

Through a process utilizing discovery workshops with the end users, community, and administrators, the design team and the district administrators were able to define exactly what Heber Springs High School needed and what the community expected. The millage campaign was successful and funds became available.

The existing Cafeteria was built in 1959, and was a cast-in-place concrete structure. There had been minor renovations throughout the years, but only the kitchen had been expanded upon. The original building's design utilized natural light through the use of clear stories, but they were later blocked by HVAC accommodations and hidden above a low ceiling, a cacophony of wires, insulation, and duct work.

The design team's primary assignment was to increase seating capacity to 300 or more, add code-compliant restrooms, air-conditioning, and a walk-in freezer to the kitchen – as well as open up the space



and create a more enjoyable dining area. There was also a need to increase the visual connection to an existing outdoor dining area, as well as have a space for after-hours sports banquets.

The new addition/renovation included an addition of over 1,000 square feet, and renovation of approximately 4,600 square feet. Along with the new square footage, the existing stage was removed in order to help meet the new seating requirement.

An audiovisual system was installed that will allow for presentations and daily announcements. All of the existing windows were replaced, and a new ceiling was installed at a level high enough to allow for the original clerestory locations to bring in natural light. The natural light was enhanced with the use of a light shelf

running the length of the south wall. A new low-maintenance rubber floor was installed, with a floor pattern that mimics the painted building structure above.

Product Information

Building Envelope: Dupont Tyvek, CertainTeed, Georgia Pacific, Durolast

Roofing: Durolast

Entrances, Storefronts & Windows: Kawneer

Interior: Telling Buildstrong, CertainTeed, Armstrong, American Gypsum, USG, Georgia Pacific

Flooring: Mannington, Roppe, Forbo, Action Floor Systems LLC

Lighting: Pinnacle, Philips, Pathway Lighting, Evenite, Color Kinetics, Starfire, Leviton

Architect

Jackson Brown Palculict Architects, Inc.
12921 Cantrell Road, #201, Little Rock, AR 72223
www.jbparchitects.com

Project Team

Structural Engineer

Engineering Consultants, Inc.
401 W. Capitol Avenue, #305, Little Rock, AR 72201

Mechanical & Electrical Engineer

HP Engineering, Inc.
1800 S. Osage Springs Drive, #110, Rogers, AR 72758

Civil Engineer

CWB Engineers, Inc.
1903 Highway 25B, Heber Springs, AR 72543

General Contractor

Clark Construction, LLC
15825 Cantrell Road, Little Rock, AR 72223

Acoustical Consultant

Avant Acoustics, Inc.
14827 W. 95th Street, Lenexa, KS 66215

Project General Description

Location: Heber Springs, Arkansas
Date Bid: May 2014
Construction Period: May 2014 to Nov 2015
Total Square Feet: 5,585
Site: .05 acres.

Number of Buildings: One; dining hall seating 373.
Building Sizes: First floor, 5,585; total, 5,585 square feet.
Building Height: First floor, 16'; total, 16'.
Basic Construction Type: Remodel/A-2, 11B.
Foundation: Cast-in-place, slab-on-grade.
Exterior Walls: CMU, brick, cementitious siding, metal panel, storefront.
Roof: Membrane. **Floors:** Concrete.
Interior Walls: Metal stud drywall.



DIVISION	COST	% OF COST	SQ.FT. COST	SPECIFICATIONS
PROCUREMENT & CONTRACTING REQUIREMENTS	25,000	2.25	4.48	—
GENERAL REQUIREMENTS	160,459	14.43	28.73	—
CONCRETE	42,500	3.82	7.61	Forming & accessories, reinforcing, cast-in-place.
MASONRY	38,000	3.42	6.80	Unit, manufactured.
METALS	99,905	8.99	17.89	Structural steel framing, joists, decking, cold-formed metal framing, fabrications.
WOOD, PLASTICS & COMPOSITES	67,850	6.10	12.15	Rough carpentry, finish carpentry, architectural woodwork.
THERMAL & MOISTURE PROTECTION	19,652	1.77	3.52	Dampproofing & waterproofing, thermal protection, weather barriers, membrane roofing, flashing & sheet metal, joint protection.
OPENINGS	105,536	9.49	18.90	Doors & frames, specialty doors & frames, entrances & storefronts, windows, hardware, glazing.
FINISHES	145,550	13.09	26.06	Plaster & gypsum board, tiling, ceilings, flooring, wall finishes, acoustic treatment, painting & coating.
SPECIALTIES	58,405	5.25	10.46	Interior, exterior signage, canopies.
EQUIPMENT	18,500	1.66	3.31	Food service.
FURNISHINGS	750	0.07	0.13	Window treatments.
PLUMBING	58,326	5.25	10.44	Piping & pumps, equipment, fixtures.
HVAC	65,000	5.85	11.64	Piping & pumps, air distribution, central heating equipment, central cooling equipment, central HVAC equipment.
ELECTRICAL	186,375	16.76	33.37	Medium-voltage distribution, low-voltage transmission, electrical & cathodic protection, lighting.
COMMUNICATIONS	20,000	1.80	3.58	Audio video.
TOTAL BUILDING COSTS	1,111,808	100%	\$199.07	
EXISTING CONDITIONS	75,300			Demolition.
EARTHWORK	49,050			Site clearing, earth moving, earthwork methods.
EXTERIOR IMPROVEMENTS	100,481			Sidewalks, curbs, gutters, fencing, gates.
TOTAL PROJECT COST	1,336,639			

UPDATED ESTIMATE TO AUGUST 2016: \$217.28 PER SQUARE FOOT

Regional Cost Trends
This project, updated to August 2016 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	\$253.03	\$1,413,172	Dallas TX	\$244.78	\$1,367,090	Los Angeles CA	\$327.29	\$1,827,907
Pittsburgh PA	\$319.04	\$1,781,825	Kansas City KS	\$330.04	\$1,843,267	Las Vegas NV	\$299.79	\$1,674,301
New York NY	\$407.05	\$2,273,363	Chicago IL	\$343.79	\$1,920,070	Seattle WA	\$327.29	\$1,827,907

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

Vendor Profiles

The following product and service providers offer solutions for your everyday and specialized facility management needs.

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Vendor Profiles

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- » Insight & actionable intelligence
- » Common operating picture of results for both operational & strategic stakeholders

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