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Compare to Clear Compare

< 26 September 2017 > Month Week Work Week Day

Jeff Quoodle

Time	Status
All day	0:00 d
8:00 a	
10:00 a	1036 There is an indication of a mechanical malfunction.
12:00 p	
2:00 p	
4:00 p	
6:00 p	

Jeff Quoodle
September 26
10 Standard Hours
2 Scheduled Hours
0 Unscheduled Hours(0 due this period)
8 Remaining Hours
20% allocated

Equipment Details

Equipment Standard PMP-1000-BM-115
Equipment Code P-009
Equipment Use Mission Support



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Contents

JAN - FEB 2018 / VOL. 28 / NO. 1.

DON'T MISS

The Three Branches of Design.....030

A look at history provides a glimpse of the future

BRADY MICK

Featured

018 Lighten Up

MICHAEL JOUANEH

027 Planning for Parking

How Strategy and Technology
Can Improve Garage Integration

STAN BOCHNIAK

036 Lighting the Infrastructure Grid

MICHAEL MEYER

042 Winning the Game of Thrones

KRIS ALDERSON

046 The Millennials Myth

CHRIS MORIARTY

052 Inside Out

Planning, Designing and
Building Outdoor Amenities

ALVARO J. RIBEIRO

058 Bringing Buildings to Life

BILL CONLEY

064 Water-Saving Synergies

IAN DEMPSTER

069 Is Your Building Ready for the Internet of Things?

MAUREEN EHRENBERG

074 Working as One

Unifying Business, FM and
Technology as "One Team"

BRUCE BARCLAY

Inside IFMA

021 World Workplace 2017: 'We are FM: A Universe of Possibilities'

024 Facility management award winners announced at World Workplace

Sections

Editor's Column 008
Chair's Column 010
President's Column 012
Industry News 014
IFMA Foundation 034

Corporate Sustaining Partners 050
Credential Recipients 056
Innovative Products & Services 078
Resources 081
Advertiser Index 082



ABOUT IFMA IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in 104 countries. This diverse membership participates in focused component groups equipped to address their unique situations by region (133 chapters), industry (15 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. To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Twitter, Facebook, YouTube and Flickr pages. For more information, visit the IFMA press room or www.ifma.org.

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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.

- VIDEO** "Highlights from IFMA's World Workplace 2017" 021
- VIDEO** "A Moment in Time: An opportunity for real estate and facilities to change the conversation" 074
- RESOURCE** "OSHA Restrooms and Sanitation Requirements and Resources" 042
- RESEARCH** "The Leesman Index 250k Report" 046
- WHITE PAPER** "IFMA-JLL Report on IoT" 069

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.

085 Ask the Experts

CONTRIBUTED BY IFMA'S FACILITY MANAGEMENT CONSULTANTS COUNCIL

089 Profiles in FM Success

093 Components in Focus

095 A Second Look at Smart Buildings

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

099 Vendor Profiles



FROM LAST ISSUE

The **November/December 2017** issue of FMJ had a theme of **Technology & Next-Gen FM**. Learn how drones are making asset management easier across the FM spectrum in the article, **Drones for Asset Management** by Kevin Price. Read it now at <http://bit.ly/0617drones>.

READER FEEDBACK

"IFMA is such a stellar organization, and I'm proud to be part of it."

— Jennifer Hatton via Engage

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SAME — IFMA FACILITIES MANAGEMENT WORKSHOP

Feb. 7-9, 2018

San Antonio, Texas



Presented in partnership with International Facility Management Association, the SAME/IFMA Facilities Management Workshop is an intensive two-day series of sessions for facilities management practitioners addressing topics including facilities management best practices, asset management, lifecycle sustainability, energy efficiency and strategic sourcing. The workshop provides insight from both the public and private sectors on emerging trends in facilities management and related fields and includes networking functions and an exhibit hall.

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From the **President**

**TONY
KEANE**

C A E

*President and
Chief Executive
Officer*

As we welcome in 2018, it is a time to reflect on the past year and to look forward to the coming year. As I look back at 2017, it turned out to be quite a year. As I have mentioned before in this column, 2017 was the year of communication. We reexamined our communication channels and put several initiatives in place to create more effective communication and interaction. Establishing the Regional Advisory Boards for the Americas, Asia-Pacific and Europe/Middle East/Africa lead to a closer working relationship with our chapters in the regions. The launch of the new Engage platform as a benefit of membership was a great success. We implemented the initial phases of the Appreciative Inquiry Process which has resulted in four significant aspirational statements. Then we had much excitement around World Workplace in Houston due to hurricane Harvey.

Going forward into 2018, we will be continuing the remaining phases of Appreciative Inquiry and incorporating the aspirational statements into our strategic planning process. The staff and board will be looking at how we can change our current organization to better position ourselves to achieve our aspirational statements. We will also continue the efforts to enhance the communication process within IFMA, building on what we started in 2017 and adding new channels where appropriate. Component leadership development workshops will return to help enhance the IFMA Member Leaders' ability to serve in component leadership positions. A strong, vibrant component network will help IFMA grow and retain membership.

In 2018, we will continue to drive relevant content, sessions and speakers to FM

events hosted by IFMA and RICS. Look for further details in the future about the joint FM Workshop with IFMA and SAME in San Antonio, World Workplace India, Facility Fusion Chicago, Facility Fusion Quebec, World Workplace Dubai, World Workplace Europe Barcelona, World Workplace Asia Singapore, World Workplace China Beijing, and World Workplace in Charlotte. Through the collaboration with RICS we will continue to promote and increase awareness about the suit of credentials and qualifications around the globe. IFMA's world class credentials — the FMP, SFP and the only global FM certification, the CFM — represent FM professionalism at its best.

I recently attended our Atlanta Chapter's thirty-fifth anniversary recognition and holiday event. It was a beautiful event in a restored trolley house. Seeing the history of the chapter flash upon the screen with the collection of pictures from throughout the years brought pride to the room. The incredible number of men and women who have helped make the chapter what it is today was impressive. The other aspect shown in the pictures was the role and impact the Atlanta Chapter and its members have had on shaping the history of the global IFMA. The Fellows and Past Chairs from Atlanta reflect a list of honored individuals who have left their mark on IFMA.

As we start 2018, I ask that you renew your commitment to IFMA and help shape the discipline and profession of facility management. Invite a colleague to join IFMA and share in the wonderful experiences of our IFMA member community.

Happy New Year!

Tony



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From the Chair

**WILLIAM
M. O'NEILL**

CFM

Chair, Board of
Directors

There is always a changing need or a new requirement waiting around the corner for facility management professionals. This is one field where it pays to constantly be aware and informed of the changing FM environment. And, of course, FMs must always be aware of how to continue to be customer focused. This requires a heightened awareness to stay curious and seek solutions that meet your company's needs. The built environment is rapidly changing, as we all know, and the way to stay current and provide value to your customers is to make sure you know of latest trends and seek to educate yourself on how they apply in your work environment.

Reading widely in the field is one way to stay on top of these changes, and in this issue of the FMJ there are many articles that can further your knowledge on topics, including how the built environment can be used as a recruitment and retention tool, the latest research on how millennials really feel about workplace design, lighting solutions and outdoor amenities that save money and increase efficiencies, and understanding how water and energy management intersect. These areas are fundamentally necessary to understand and be educated in to be a successful as an FM professional. This leads me to two challenges that I have for you this year:

- 1. Continue your professional development.** Make sure that during 2018, you read articles in FMJ, attend a lecture, and participate in dialogue with your colleagues around at least one of IFMA's CFM 11 core competencies*. Be purposeful in learning the latest that IFMA has to offer in these areas.
- 2. Take the initiative to start on an educational journey** in one of the 11 competencies and become a Subject Matter Expert (SME) in that area. Learn all you can, and bring that knowledge to your company and team.

Many career professionals, even after some time in the field, believe that the answers are somewhere "out there." I have been guilty of this way of thinking, and it has been important and satisfying for me to change my approach to learning. I would say, with a great deal of certainty, that I (and you) have every capability to be an expert and to create innovative thinking and participation within IFMA and your workplace. It only takes some discipline and focus to get started. You can do it, and together, we can continue to be thought leaders in FM in the coming year.

Wishing you and yours a happy New Year's!

* *The 11 core competencies were defined in IFMA's 2009 Global Job Tasks Analysis (GJTA).*

Facility managers in 62 countries were surveyed to uncover the core skills required in the field, making this the first comprehensive, global FM survey in the marketplace. The core competencies are:

- Communication
- Emergency Preparedness and Business Continuity
- Environmental Stewardship and Sustainability
- Finance and Business
- Human Factors
- Leadership and Strategy
- Operations and Maintenance
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- Quality
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For more information:
<https://www.ifma.org/about/what-is-facility-management>

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Editor's Note Jocelyn Kerr

Now that the new year is upon us (too quickly, perhaps), some 41 percent of us find ourselves yet again embarking on some form of New Year's Day resolution.

Statistic Brain Research Institute, a U.S.-based survey and data analysis firm, found that while those 41 percent of us are toiling our way through January on health or life improvement goals, another 59 percent of Americans either never or infrequently bother making any resolutions. The fact only nine percent of people surveyed feel they are successful in their resolutions each year may explain why so many have given up. Or maybe it's the abysmal rate of follow through — a full 27 percent of respondents said they couldn't maintain their resolution through the first week of the year. Yikes.

Whichever camp you find yourself in, a new year does bring an opportunity to evaluate what's working and what could use some improvement. If you read our On Standards series on implementing an MSS in 2017, you know it takes a clearly defined plan and a series of milestones to implement any improvements — and to make them stick.

IFMA, as an organization, is going through a sort of resolution process itself. Last August we embarked on an Appreciative Inquiry process to set a vision for the next ten years. Many of you participated in surveys and shared your stories at World Workplace in Houston — see our World Workplace roundup on Page 21 for details on that project and the great service project IFMA members participated in as part of Hurricane Harvey cleanup.

They say the past is prologue, so as we look back at World Workplace and how to move forward as an organization, in this issue we also look at the history of building design and the ways classical architectural principles can be used to create modern built spaces. "Three Branches of Design," on Page 30, provides an overview of what makes an aesthetically pleasing — and functional — facility.

"Form Meets Function" is our theme this time around, and it's fitting that we're arriving at the start of a new year as we examine the connection between the frequently utilitarian tasks of O&M and the need for an overarching aesthetic to attract and retain occupants and personnel. How can our spaces evolve? What can we do to create more efficient, welcoming spaces that serve our triple-bottom-line?

Whether you made a resolution this year, or not, may all your goals be SMART in 2018, and may all your facilities be efficient, aesthetically enjoyable and filled with productive people. As always, reach out to me with any ideas, and please share any member, chapter or component news briefs!

Happy New Year.

Interested in writing for FMJ?

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

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Industry News

RICS' REPORT EXAMINES WHAT AI MEANS FOR THE BUILT ENVIRONMENTS

“Within the built environment, the impact of AI will be felt the greatest in facility management. This is because areas of FM have scope for automation.”

— CHRIS HOAR
Co-author,
RICS Insight Report

RICS' Insight reports cover topical issues in land, real-estate, construction and infrastructure. Access the AI report at bit.ly/2iZ1SN5.

Artificial intelligence (AI) is predicted to have a huge impact on the FM landscape, according to an Insight report published by the Royal Institution of Chartered Surveyors (RICS) in collaboration with the International Facility Management Association (IFMA).

From the design and construction of a building, to managing and maintaining it, AI is increasingly being integrated into core business strategies, impacting the work of surveyors and facility managers. The report examines current thinking, applications and predictions surrounding AI to uncover how it will transform the way we work and how we can exploit it to improve the quality of the built environment. Risks and opportunities are weighed; but the primary take-away is that workplace professionals need to understand what this technology can do now, what is probable in the foreseeable future and the actions that might have to be taken to deal with it.

Education and technology experts envision the campus of the future

Drones will shepherd robots on a clean campus — this is just one of the messages about the future of higher-education facility management that emerged from Planon's first Higher Education Symposium.

Held Sept. 29, 2017, at the Harvard Club of Boston, the event united experts in higher education and technology with university and college personnel from the United States and Europe to share ideas about how technical innovation is transforming higher education. Interactive workshops generated intriguing scenarios about the smart campus of the future.

Participants were asked to focus on a common facility management business process of their choosing, and to design a speculative scenario in which emerging technologies could remove friction points from the process. One of the groups focused on litter and trash removal — the concept of a constantly “clean campus” — and envisioned the use of robots to roam the campus conducting trash pickup, while drones scouted locations where service was needed and guided the robots to the areas.

Other workgroups created similar scenarios around equipment maintenance and financial processing, enlisting technologies such as BIM, artificial intelligence, machine learning and 3-D printing to speed up work and eliminate sticking points in workflow. The exercise assumed a five-year window for implementation.

Sponsored by IFMA Silver-level Corporate Sustaining Partner Planon Corp., the day-long event included presentations from two European universities — Lancaster University in the United Kingdom, and Wageningen University in the Netherlands — addressing their advanced facility management processes, and the importance of communities in promoting the distinctive requirements of the academic world in managing facilities and real estate.

UPCOMING EVENTS

SAME-IFMA FM Workshop

Feb. 7-9
San Antonio, Texas, USA
www.fmworkshop.org

World Workplace India 2018 Conference and Expo

Feb. 15-16
Mumbai, Maharashtra, India
worldworkplaceindia.ifma.org

Facility Fusion U.S. 2018 Conference and Expo

March 20-22
Chicago, Illinois, USA
facilityfusion.ifma.org

World Workplace Forum Middle East 2018 Conference and Expo

April 19
Dubai, United Arab Emirates
www.ifma.org/events/fm-events

World Workplace Europe 2018 Conference and Expo

May 15-17
Barcelona, Spain
www.worldworkplaceeurope.ifma.org

International Sustainable Asset Management Conference 2018

June 4-6
Atlanta, Georgia, USA

Hong Kong Jockey Club facilitates FM professional development in Asia

Founded in 1884, the Hong Kong Jockey Club (HKJC) is a world-class horseracing operator and Hong Kong's largest community benefactor, operating as a not-for-profit organization. Underlining its commitment to promote lifelong learning among its employees, HKJC offered IFMA's instructor-led Essentials of Facility Management course to its full-time employees last October.

Conducted at HKJC's new college — a state-of-the-art training facility that provides a range of learning and development opportunities delivered by in-house and external subject matter experts — the course attracted more than 40 registrations within a week from various business functions across the organization such as catering, retail, Telebet, HR and IT.

"It was great to see interest from other non-FM staff who want to explore the FM world and may eventually join the industry," said Graham Tier, Head of the Property and Facilities Management Department at the Hong Kong Jockey Club.

Engage mobile app is live in iOS and Google Play app stores

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Share documents and interact with FM colleagues at engage.ifma.org.

ACQUISITIONS & EXPANSIONS

Sodexo Singapore acquires Kim Yew Electrical & Sanitary.

Kim Yew Electrical & Sanitary, one of Singapore's top hard FM service providers, will now operate as a wholly owned subsidiary of Sodexo Singapore under its new name, Sodexo Kim Yew Pte. Ltd. Combining Sodexo's capabilities in FM and food services with Kim Yew's technical expertise in hard FM services allows Sodexo Singapore to enhance its service offering and address the needs of the growing integrated FM services market in the region.

Trane® acquires CALMAC® Corp. Trane, a global provider of indoor comfort systems and services and a brand of Ingersoll Rand, has acquired CALMAC Corp., a privately held company specializing in cool energy technologies. CALMAC's ice-storage tanks are integrated with Trane commercial HVAC systems to take pressure off the energy grid. The CALMAC acquisition is consistent with Ingersoll Rand's strategy to help customers solve climate and industrial challenges, including energy and fuel efficiency, food waste and productivity.

Accruent acquires BlueCielo. Global software company Accruent has acquired Amsterdam-based BlueCielo, an advanced asset life cycle information management provider. More than 1,200 companies around the world depend on BlueCielo Meridian solutions to ensure compliance, control costs, improve safety, protect their brand reputation and extend the lifespans of decades-old assets. The BlueCielo acquisition is the latest in a series of strategic acquisitions fueling Accruent's growth, including Lucernex, a global provider of integrated workplace management systems, and Verisae, a provider of cloud-based solutions that connect facilities and assets to the maintenance and service network through the Internet of Things.

Invicara establishes offices in the U.K. and Ireland. A provider of transformative solutions for building information modeling (BIM), Invicara has opened offices in the United Kingdom (U.K.) and Ireland. The company's flagship product, BIM Assure, will help ensure compliance to the U.K. BIM mandate, provide better access to BIM models, and help owners streamline transitions to building operations, leveraging complete, reliable, digital handover.

AkitaBox continues rapid growth with new office space. To accommodate a rapidly growing team for their facility management software solution, tech company AkitaBox has moved to a new space offering three times the square footage of their previous office. The 10,200-square-foot suite offers plenty of space for collaboration and features dedicated, department-specific breakout spaces and conference rooms. Quadrupling in size since 2016, AkitaBox now employs more than 60 facility innovators and has successfully provided software implementation in more than 200 million square feet of building space across the United States.

Industry News

Industry News

SURVEY REVEALS MAJORITY OF FACILITIES TEAMS ARE UNPREPARED FOR CATASTROPHES

Survey statistics in the just released eBook "Information Management for Facilities and Operations" show that building managers and their facility teams aren't as prepared for the next catastrophe as they'd like to be.

Released by AIIM Market Research and ARC Document Solutions, the eBook highlights trends in facility management on preparedness and recovery, including cloud storage and accessibility of building information, the ability to respond to emergencies, and succession planning to preserve knowledge and information.

The survey reveals that a catastrophe in a commercial building or public facility can be expected every two years, far more often and at a far higher cost than previously believed. Catastrophe types incurring the highest costs include water, fires, wind-related and earthquakes and overall, there was an average cost of US\$500,000 in damages to buildings.

Accessing information, including emergency response plans, ranked as one of the top-three challenges faced by facilities teams following a catastrophe.

For more survey findings, download the eBook at <http://go.e-arc.com/ebook-ifma>.

Of the survey respondents who cite having digital policies and procedures in place, 29 percent report these documents are in the cloud, and only 15 percent say they are accessible on mobile devices.

"The survey results highlight the urgency for facilities and operations teams to adopt modern practices for building information storage and retrieval to be prepared for the next catastrophe," says Brian Bailard, EVP and general manager of ARC Technology Solutions, a unit of IFMA Silver-level Corporate Sustaining Partner ARC Document Solutions. "The added benefit of cloud storage is enabling anytime, anywhere access to facilities dashboards via mobile devices."

The eBook contains insights from a survey conducted in August 2017 by AIIM to their 190,000+ global community of facilities and operations professionals.

Louvre Abu Dhabi welcomes visitors on sold-out opening day

On Nov. 11, 2017, Louvre Abu Dhabi opened its doors to the public. The highly anticipated museum welcomed thousands of visitors to see the exceptional architecture and the masterpieces displayed throughout the galleries.

The museum is located on Saadiyat Island, 500 meters off the coast of Abu Dhabi, United Arab Emirates. A mixed commercial, residential and leisure project is currently under construction on the island, expected to be completed in 2020.

Louvre Abu Dhabi was born out of a unique intergovernmental agreement between the governments of Abu Dhabi and France in 2007. As part of the

agreement, Louvre Abu Dhabi has access to expertise and training from 17 French partner institutions, as well as loans from 13 leading French museums for 10 years, and will benefit from special exhibitions organized by these institutions for 15 years.

Designed by French architect Jean Nouvel, the museum contains 12 chapters in the galleries, special exhibition spaces, a Children's Museum, auditorium, restaurants, retail and a research center. Surrounded by the sea, the buildings are connected by waterfront promenades beneath the museum's stunning dome. Tickets, tours and more information are available at www.louvreabudhabi.ae.

AWARDS

Power UP receives 2017 Project of the Year award for renovation project.

The Associated General Contractors of Missouri honored Power UP electrical contractors in November 2017, with the "Project of the Year" Keystone Award for their electrical and lighting installation work on the US\$24-million Kiener Plaza renovation in St. Louis, Missouri, USA.

KPost named 2017 Commercial Roofing Contractor of the Year.

KPost Roofing & Waterproofing was named 2017 Commercial Roofing Contractor of the Year from Roofing Contractor Magazine, having worked on projects such as JP Morgan Chase, Toyota North American Headquarters, Dallas Cowboys World Headquarters, AT&T Stadium, Irving Music Factory, Omni Dallas Convention Center Hotel, Reunion Tower, The Statler Hotel and others.

Duke's Landscape Management receives safety award.

Duke's Landscape Management Inc. was awarded the 2016 Safety Recognition Award in the National Association of Landscape Professionals (NALP) annual Safety Recognition Awards Program.

Demand Logic awarded 2017 Building Tech of the Year.

Demand Logic was recognized at the businessGreen Tech Awards with the Building Tech of the Year award for its software tool that allows for swift acquisition and visualization of an entire commercial building's terminal unit functionality and performance level.



Service has a new name: Kathy & Bronislawa

At Cushman & Wakefield's new global headquarters, maintaining a world-class image is a must. That's where Kathy and Bronislawa come in. Their cleaning team works around the clock to make sure the headquarters is not just healthy and pleasant, but also reflects well on Cushman & Wakefield's iconic brand. They're meticulous and proactive - under their watch, work orders are down, and the space looks as good the day it opened. From the server room to the C-Suite, C&W Services has the expertise to manage all of your facility's needs.

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lighten up

DESIGN MODELS
THAT CREATE
RETURN ON
INVESTMENT

Facility design that focuses on wellness and sustainability is proving to have a positive impact on employee satisfaction and productivity. This idea is broadly known as the 3/30/300 story — as a general rule, organizations spend approximately US\$3 per square foot per year for energy, US\$30 for rent and US\$300 for personnel. Since people are a company's most valuable asset, improving their overall experience delivers the greatest return on investment. The WELL Building Standard provides a model for space design and construction that integrates performance-based systems to positively impact the built environment. Lighting control is an essential piece of this proverbial puzzle.

Leadership in Energy and Environmental Design, or LEED, certification helps promote the use of building systems that enhance energy performance standards. Many organizations, and building professionals, who have successfully implemented LEED in their buildings are now also turning their attention to the WELL Building standard as a guideline for facility design focused on wellness, comfort, and productivity.

The Washington, DC-based headquarters of the American Society of Interior Designers is the first space in the world to achieve platinum-level certification for both the WELL v1 Building Standard™ (also known as WELL) and LEED, under the LEED ID+C rating system v4.

To achieve this dual certification, ASID leadership, along with architectural firm Perkins+Will, lighting designers Benya Burnett Consultants and electrical engineers GHT Limited, were committed to making the facility a showcase for progressive design. Together, they prioritized the goal of achieving dual Platinum certifications. As such, the project serves as an excellent model for how design can meet the needs of the people in the space, while supporting LEED and WELL certifications.

By looking into the structure of the WELL Building Standard, and examining features that lead to certification, we can better understand the role lighting control plays in helping to achieve WELL requirements. A centralized light and shade management system was essential to meeting project goals.

To enhance its value proposition, WELL Building certification may also help companies attract and retain top talent in an increasingly competitive environment. It creates a more attractive facility by:

Improving the environment for employees and clients

Supporting thought leadership

Contributing to increased productivity

Enhances employee satisfaction and retention

the light concept

The WELL Building Standard promotes lighting and shading systems that increase alertness, enhance the overall occupant experience and even promote healthy sleep. The Light Concept area provides illumination guidelines to minimize disruption to the human body's circadian system, enhance productivity and provide visual acuity. In designing lighting and control solutions to meet WELL requirements, the lighting professional will consider standard strategy categories including: activity-based light levels, color quality, daylighting, and glare control for any given space.

Because LEED and WELL certifications provide complementary benefits, designing a lighting control system that effectively supports both certifications demands intricate knowledge of the lighting control system capabilities as well as the certification requirements.

Fixture selection and fenestration play a role in all preconditions and most optimizations in the WELL Light Concept. A smart, integrated lighting and shade control solution can specifically help achieve precondition features in Visual Lighting Design (#53), Circadian Lighting Design (#54), and Solar Glare Control (#56), and is essential for optimization features in Automated Shading and Dimming Controls (#60) and Daylight Modeling (#62). We'll examine each of these features in more detail, and define the contributing role of smart lighting control solutions.

WELL certification starts with seven concepts that influence human behaviors and define a wellness-focused environment: air, water, nourishment, light, fitness, comfort, and mind. Under these concepts there are "features" or provisions with requirements that have to be met.

Some features are mandatory "preconditions," while others are optional "optimizations."

There are three levels of WELL certification:

SILVER

Meets 100 percent of WELL preconditions applicable to the project type in all concepts

GOLD

Meets all WELL preconditions and 40 percent or more of the optimization features

PLATINUM

Meets all WELL preconditions and 80 percent or more of the optimization features

SOURCE www.wellcertified.com/en/content/are-there-levels-well-certification

visual lighting design

FEATURE #53

The visual lighting design feature defines required average light levels of 215 lux on the horizontal plane, measured at 30" above the floor, as well as independently controlled zones of light no larger than 500 square feet. Also, this feature requires appropriate brightness and contrast ratios on different surfaces among spaces, and among surfaces within a space, to avoid dark spots or excessively bright spots in a room. Tunable lighting (setting maximum lighting output to the appropriate illuminance level) helps designers meet the contrast ratios.

Lighting design can meet required lux with fixtures alone, but this strategy can result in very bright light, which is acceptable early in the day but less desirable in the late afternoon when it can negatively affect sleep patterns. Designing an integrated light management system with usable daylight enables the shades to help regulate daylight, provides the required foot-candles, and prevents glare, while the drivers and ballasts automatically dim to help save energy.

In accordance with the WELL Standard, lighting zones must be no larger than 500 square feet, or 20 percent of an open office floor plan. Digitally addressable ballasts and drivers can accommodate zoning requirements without the need for complex wiring, and when the furniture or layout inevitably changes, zones can be

easily adjusted using software with no need to rewire.

Tunable white fixtures and controls allow lighting to adjust automatically and unobtrusively over the course of the day. For example, short wavelengths of light can be included earlier, then scaled back in the afternoon to minimize sleep disruption. While WELL certification does not focus on energy efficiency, energy savings is still a consideration in most commercial buildings. Lighting control solutions that integrate with daylight and occupancy sensors, or daylight responsive shading, can significantly reduce energy use.

Using automated, digital control, the lighting design not only complies with certification requirements, but easily facilitates integration with timeclock control. With a single button or command, all lighting zones can be turned on or off, and still deliver zone-based occupancy or daylight control. This is one example of how advanced lighting control solutions go beyond certification requirements to simplify operations for the facility management team.

circadian lighting design

FEATURE #54

This aspect of certification is designed to provide lighting conditions that reinforce natural patterns of the human circadian cycle with appropriate melanopic light intensity in work areas. At least one of the following requirements must be met:

- **250 equivalent melanopic lux (EML)** is present at 75 percent or more of workstations, at four feet above the finished floor, for at least four hours per day
- **Ambient lights** provide recommended illuminance of equivalent melanopic lux greater than or equal to lux recommendation from IES

For a facility manager working to provide the most comfortable, productive environment for employees, the blue light that helps meet EML during the day can have a negative impact on sleep at night. This is one motivator for the enhanced use of color-tunable fixtures with appropriate control solutions — they can provide biologically active light during the day at lower power consumption, and adjust to less biologically active light in the evening and night.

solar glare control

FEATURE #56

Solar glare control helps mitigate glare from the sun by blocking or reflecting harsh, direct sunlight away from space occupants. A key requirement is to provide controllable or automatic window shading, and this feature cannot be met with a static glare inhibitor such as overhangs. By using an automated shading solution, the lighting control design can also help meet optimization Feature #60, Automated Shading and Dimming Controls.

daylight modeling

FEATURE #62

Daylight Modeling supports circadian and psychological health by setting thresholds for indoor sunlight exposure. Manual shades can be used to meet this WELL feature, but automated shades that respond to changing daylight conditions can increase spatial daylight autonomy. Using this control strategy, a facility can meet the requirements for LEED Daylight credits in addition to the WELL Daylight Modeling feature.

rising to the challenge

The ASID project set a high bar for sustainable, wellness-oriented, energy-efficient lighting design, using an integrated lighting and shading control system to contribute in three WELL concepts and four LEED categories, including almost all the energy efficiency points. LEED is energy focused and WELL is tailored to human performance and health — but together they deliver a versatile, responsive space. In the ASID offices, adjustments can easily be made using software to ensure the space remains dynamic, and the facility team is able to quickly make adjustments to meet changing space requirements. Achieving WELL and LEED Platinum helps change the conversation about how to design a space that promotes both wellness and sustainability.

Integrated lighting and shade control delivers a comfortable space that promotes a creative work environment and helps the facility management team make adjustments over time without disrupting the flow of business. As research continues to uncover the benefits of dynamic building design, lighting controls will continue to make important contributions to ensuring the right environment for the people in the space. **FMI**



Michael Jouaneh is manager of sustainability and energy standards for Lutron, the world leader in light control solutions. He is a frequent presenter at industry events such as Lightfair International and Greenbuild, and is active in the development of the top energy and green building codes/standards for the U.S. He is also the author of several published articles, whitepapers, and case studies on high-performance, energy-efficient green buildings. Michael is the vice chair of the Lighting Controls Association, and is involved with many organizations, including ASHRAE, the California Energy Commission, National Electrical Manufacturers Association, Illuminating Engineering Society, International Code Council, and the U.S. Green Building Council. He is a Certified Energy Manager, Green Globes Professional, and a LEED AP.

INSIDE IFMA

World Workplace 2017: 'We are FM: A Universe of Possibilities'

Change was in the air as the International Facility Management Association kicked off the 2017 World Workplace Conference Expo in Houston, Texas, USA in October. More than 4,000 attendees gathered from around the world just six weeks after Hurricane Harvey unleashed record-breaking rains and flooding in the city.

In a year that also saw major disaster relief efforts after hurricanes Irma, Jose and Maria, as well as a major earthquake in Mexico and landslides from South Asia to Columbia, disaster preparedness and recovery were topics on many attendees' minds.

For Danielle Soria-Orozco, an event specialist who joined IFMA's staff shortly before the flooding, the aftermath of Harvey presented an opportunity to bring FMs together to help a Houston facility in need.

"I come from a charitable, service-based background, so it was an area [we] wanted to try to incorporate into events moving forward once I was on board. The requests to assist with Harvey-related service projects was huge, and we decided to pull together an opportunity for our members to assist in a project that would put their facility management skills to great use," she says.

Soria-Orozco is a volunteer for the Oaks Dads Club, a youth sports organization that offers baseball, softball and soccer instruction to more than



“ I have worked with hundreds of volunteers over the years, but the IFMA World Workplace volunteers are some of the most amazing I have ever met. **My takeaway was how incredibly generous the IFMA community can be.** ”



400 Houston-area kids between the ages of four to 14. ODC has been in operation for 60 years, and she knew firsthand the flood devastation they had on their fields and clubhouse.

“Their clubhouse took in over a foot of water and their playing fields lost a great deal of red clay dirt. More importantly, many of our families and coaches were largely affected by Harvey and some lost their entire homes. ODC is 100 percent volunteer driven,” she says. “It seemed like a perfect fit for IFMA members to not only participate in a service related project, but a project that was relative to their jobs. I also cannot leave out that all of the tools used to complete the project were provided for use by the Houston ToolBank [an organization that loaned out free tools to anyone involved in the cleanup and rebuilding efforts].”

In a single day, the group of IFMA members, which included several members from the San Diego Chapter, did a demo of the clubhouse, replaced all six doors, installed new insulation, cut and replaced wall panels, dispersed new dirt onto the playing field, and repainted the concession stand.

“I think we all smiled bigger on the way home, knowing something real and meaningful was accomplished,” Soria-Orozco says. “I have worked with hundreds of volunteers over the years, but the IFMA World Workplace volunteers are some of the most amazing I have ever met. My takeaway was how incredibly generous the IFMA community can be.”

IFMA members also got an introduction to IFMA’s four “aspirational statements” that are part of the organization’s ongoing Appreciative Inquiry process to set a vision for the future. Launched in August 2017, the global board, along with IFMA staff, have participated in “discovery and dream” workshops to arrive at four aspirational statements for IFMA’s future.

Appreciative Inquiry is a method of exploring the positive, “high point experiences” people have in an

ASPIRATIONAL STATEMENTS

1. Sharpening FM Skills
2. Exceptional Member Experience
3. Broadening and Globally Advancing the FM Profession
4. The Evolution of the Global FM Profession and Its Member-Centric Organization

organization, and to use those stories to design a roadmap to the future. It involves multiple rounds of workshops and surveys to gather as much stakeholder input as possible.

Members on the expo floor had the opportunity to visit IFMA Central to read details about the four aspirational statements, ask questions of Appreciative Inquiry workshop participants, be interviewed on camera telling their “IFMA story,” and to fill out surveys giving their thoughts about the statements and their personal vision for IFMA’s future.

Cheryl Duvall, FIIDA, CID, MSOD and president of Avance Consulting, designed and is facilitating the process.

“The inclusive nature of the AI process ensures that we reach out across the association to gather a wide representation of ideas and insights to help shape IFMA’s strategic objectives. Rather than just one or two stakeholder groups making decisions on behalf of members, the AI process enables all nine stakeholder groups to offer feedback, explore solutions, and co-create viable possibilities for the future of FM,” she says.

Duvall said more than 80 comment cards were collected from members on the expo floor, and additional personal stories were collected by a roving videographer.

“A.I. received a huge endorsement at WWP, beginning with the introduction of the four Aspirational Statements during the House of Delegates meeting,” Duvall says. “Through the AI interview process ... we were able to gather more than a hundred stories highlighting how IFMA has changed career trajectories, advanced the profession, and connected facility managers across the globe.”

The process is ongoing and is intended to strengthen the organization as it moves forward in the fast-changing world of facility management. World Workplace 2017 marked the start of member engagement in this vision, further driving home the year’s theme — **We are FM: A Universe of Possibilities.** 



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INSIDE IFMA

Facility management award winners announced at World Workplace

IFMA's Awards of Excellence were announced October 20 at World Workplace 2017, held in Houston, Texas. Nominees for the annual award are scored by judging panels of industry experts who evaluate each in several areas that indicate exceptional contributions to the facility management profession and the organization.

In addressing the changes and challenges facing all organizations, IFMA President and CEO, Tony Keane, CAE, said, "This year's award recipients are no strangers to this fast-paced climate, and have persevered to achieve excellence — both in their work and in their contributions to IFMA and the FM industry."

Also announced at the awards ceremony were three new IFMA Fellows, the 2017 IFMA Foundation Trustees Awards, presented by IFMA Foundation Chair Michael Schley, and the Lighting Energy Efficiency in Parking (LEEP) Campaign Awards, presented by Jason Hartke, Ph.D., program manager, commercial buildings integration, U.S. Department of Energy. 

The 2017 IFMA Awards of Excellence

Associate Member Award

Christian Pellecchia

Chair Citation

Kate North, global chair of IFMA's Workplace Evolutionaries Community

Distinguished Member Award

Larry Morgan, CFM, SFP, FMP

Emerging Professional Award

Caitlin Schaapman

Facility Management Innovation Award

Madhav Karandikar, Symantec Corp.

Distinguished Author Award, Book or Instructional Materials

Diane Coles-Levine, MCR, Nancy Johnson Sanquist, IFMA Fellow; Co-editors of "Work on the Move 2: How Social, Leadership and Technology Innovations Are Transforming the Workplace in the Digital Economy"

Distinguished Author Award, Web Based/Social Media

Stephen Monaco, AIA

Distinguished Author Award, Article or Research Paper

Bill Conley, CFM, SFP, FMP, IFMA Fellow; Author of "Biomimicry: Imitation as a Science," FMJ Magazine article

Community Award of Excellence in Communications

Workplace Evolutionaries

Council of the Year Award

Legal Industry Council

Large Chapter of the Year

San Diego Chapter of IFMA

Large Chapter Award of Excellence in Professional Development

San Diego Chapter of IFMA

Large Chapter Award of Excellence in Web Communications

Capital Chapter of IFMA

Small Chapter Award for Excellence in Web Communications

Central Pennsylvania Chapter of IFMA

The George Graves Award for Facility Management Achievement

YMUS Cypress Facility Department, Yamaha Motor Corp.

The Sheila Sheridan Award for Sustainable Facility Operations & Management

Global Property Team, Arm

Student Chapter of the Year

Greater Phoenix Student Chapter of IFMA



NASA astronauts, and twin brothers, Captains Mark and Scott Kelly, gave the keynote address at the luncheon.

2017 Class of IFMA Fellows

RICK COREA

IFMA Fellow
*Director of global facilities
 ON Semiconductor
 Phoenix, Arizona, U.S.A.*

Rick has devoted more than 36 years to excellence and improvement in facility management, through IFMA's Greater Phoenix and Malaysia Chapters; as a mentor for the Arizona State University (ASU) education and research programs; and as the architect and driver of IFMA's award-winning Greater Phoenix Student Chapter, extending its internship program internationally. As a founding member, ongoing advisor and corporate sponsor of the student chapter, he has written its bylaws, mentored students, established a sponsorship and organized paid FM internships for ASU students. Corea has received many awards individually and on behalf of his company, including a 2016 Citation from the Chair of IFMA's Board of Directors, and a Lifetime Achievement Award from IFMA's Greater Phoenix Chapter. As Director of Global Facilities for ON Semiconductor in Phoenix, Arizona, USA, his innovative approach to managing each facility has resulted in streamlined policies and procedures, earning ON Semiconductor the Professional Organization of the Year award for five years from IFMA's Greater Phoenix Chapter.

COLLINS OSAYAMWEN

CFM, FMP, IFMA Fellow
*Cofounder and managing partner
 SheltercareFM Consult
 Nigeria*

Collins is a global ambassador for the facility management profession, committed to increasing awareness of FM in Africa through government advocacy, speaking on FM-related topics and developing student programs. After joining IFMA in 2004, Osayamwen was directly responsible for securing approval to establish the Abuja and Greater Accra Chapters. He served on IFMA's Board of Directors, and was a valuable resource in the Global Organizational Strategy Task Force, helping to magnify the "I" in IFMA. He served as the IFMA Foundation's Ambassador to Africa; and is currently the Interim Vice Chair for the Nigeria FM Initiative, whose goal is to provide a national platform for the promotion and continuous development of FM to the government of Nigeria. In his role as Cofounder and Managing Partner of SheltercareFM Consult, he provides leadership to more than 150 staff members, sets direction for the organization, and develops vision and strategies to deliver world-class solutions to multilateral and bilateral organizations and national governments.

JAMES P. WHITTAKER

P.E., CFM, CEFP, FRICS, IFMA Fellow
*Director of engineering services
 Americas, JLL
 Chantilly, Virginia, U.S.A.*

James is a Past Chair of IFMA's Board of Directors. He served on the IFMA Foundation's Board of Trustees, created IFMA's Standards Committee, and led the review and revision of IFMA's ethics policies as Chair of the Ethics Committee. As Founding Chair of IFMA's FM Research and Benchmarking Institute (RBI), he led the development of the RBI charter, Founder's Circle, Development Council, and establishment of policies to organize and further FM research. The breadth of Whittaker's contributions to IFMA, the American National Standards Institute, the National Research Council, the U.S. Department of State, the National Institute of Building Sciences, and many other organizations and academic institutions speak to his focus, energy and service to the FM profession. One of his greatest gifts to FM globally is his leadership role in the U.S. ANSI, International Organization for Standardization standards refinement, which is crucial to elevating the validity and value of IFMA's educational programs. In the last 10 years, he has given 93 presentations, contributed to four books, written 14 journal articles, taught 90 courses and impacted nearly 1,350 students. With more than 30 years of experience in the facilities and engineering industries, Whittaker is the Director of Engineering Services – Americas for JLL.

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PLANNING FOR PARKING

HOW STRATEGY
AND TECHNOLOGY
CAN IMPROVE GARAGE
INTEGRATION



Mixed-use developments are on the rise, and they bring together residences, retail, hotels, nightlife and office spaces in a walkable environment. However, parking is still an important part of the picture. Office workers, shoppers, hotel guests, and other visitors often arrive at developments by car, so reliable, safe parking is a critical component of the customer experience. Each type of business attracts customers with varying demands, and their expectations for parking are diverse. By implementing technology, zoned parking, and an attentive maintenance program, a facility can maintain a financially successful garage that provides an exceptional customer experience.

BY STAN BOCHNIAK

Manage Expectations

With a diverse cross-section of customers, there are a wide range of expectations to manage. Office workers and hotel guests may expect to pay, while shoppers and restaurant guests will expect to get their parking validated or receive discounts on the standard rates. Shoppers, in particular, aren't used to paid parking garages, since traditional shopping malls typically offer free parking. Many stores will validate or discount parking, and that needs to be communicated to shoppers through signage and instructions on gate and ticket kiosks.

Hotel guests and office visitors also need education, as they're unlikely to be familiar with the rules of the garage. Signage is one way to address that challenge, but parking attendants and remote command centers are also key to making sure drivers understand the policies and navigation of the garage. Command centers can take on the role of parking attendants by answering customer questions and monitoring for abuse. Regardless of whether attendants are mobile or communicating through kiosks, it's important that parking staff understands the needs of each customer type and are prepared for their questions and concerns.

License Plate Recognition

Depending on agreements with the tenants of the development, pricing structures for shoppers, office workers, and hotel guests can vary. That complicates revenue collection and can create confusion for customers. Ensure pricing guidelines are clearly communicated, so the right amount is collected from each customer without creating frustration.

One way to address this challenge is license plate recognition (LPR) technology. As each customer comes in, their ticket is paired with their license plate. Parking is separated into zones, and LPR technology associates the customer with the zone they park in. That data is sent to the revenue control system, and when the customer leaves, they are charged according to the rate structure for that zone.

LPR technology can also be used to



By mixing in technology and low-tech tactics like signage and zoning, it's possible to create a financially viable garage that makes parking hassle-free.

identify customers who don't need to pay. For instance, some mixed-use developments allow for free parking for customers who park for less than an hour. LPR technology can identify drivers who haven't exceeded that time frame before they even have a chance to enter their ticket at the gate kiosk. This allows drivers to exit more quickly, and it cuts down on potential traffic jams at the garage exit.

LPR technology also helps monitor for abuses. Systems are growing more sophisticated by aggregating data and "learning" about driver behaviors. This allows garage managers to be more proactive about identifying issues and addressing them more efficiently. For example, LPR technology can be programmed to recognize which zone a particular car typically parks in, and it will notice when something is inconsistent. If someone is parking in the wrong zone — say, an office worker taking a spot designated for retail — they can be flagged for parking in the wrong area and addressed accordingly.

Zoned Parking

Segregating parking into zones doesn't just help identify each driver's destination. It also makes it easy to ensure that each customer has access to the best spaces at the right time of the day and week. For example, during the work week, office workers may take up the best spaces before stores open. Since they're more likely to stay parked for several hours, those spaces end up being taken for a good portion of the day. As a result, shoppers end up with fewer convenient parking spots. One way to address this is to close lower parking levels in the early part of the morning on weekdays. Since shoppers stay for a shorter time, this ensures that those quality spaces are regularly made available to incoming customers throughout the day.

The key to making zoned parking work is signage, particularly for transient customers like hotel guests and shoppers. Signs don't just direct drivers to the right sections — they also help guide them to exits and to the stairwells closest to the businesses they

plan to visit. While it seems simple, insufficient signage is an inconvenience that can drive customers, especially shoppers, away. At traditional shopping malls, customers have the luxury of seeing which stores they're parking closest to. In a mixed-use parking garage, it's easy to end up accidentally parking next to a locked office entrance or a hotel lobby — and far from the shops and restaurants.


To prevent frustration, signage must be kept clean and unobscured. It should also be consistent. For instance, reserved spaces may be denoted with signs on the wall or railing at the driver's eye level, or they can be painted on each space. Some operators make the mistake of using different methods in one garage. Others will use both methods with varying degrees of consistency. This creates confusion for visitors as well as tenants with reserved spots. An established policy makes it easy for parking staff to maintain consistency.

Maintenance Demands

Since mixed-use garages are used more than traditional garages, their maintenance demands are higher. Spaces turn over more quickly, and everything from elevators to trash cans are used more frequently. Regular maintenance tasks, like sweeping and steam cleaning, have to be done more often and scheduling is a bit more challenging. It's often better to schedule maintenance in the late evening and early morning. To get work done before customers arrive, be prepared to increase staffing to get it done more quickly.

Different customer types will create different maintenance needs. Office workers and residents tend to be more conscientious about litter and overall cleanliness, while transient customers can create more litter. If a mixed-use development has restaurants and nightlife, be prepared to deal with inebriated customers, who are messier.

Mixed-use developments are increasingly popular — businesses see them as a way to attract customers who want

walkable environments and enjoy the live-work-play balance. To keep tenants and customers satisfied, anticipate their questions and concerns. Having an established operational plan, with clear protocols for everything from cleaning to dealing with abusers, will ensure the facility is able to respond to their diverse needs. By mixing in technology and low-tech tactics like signage and zoning, it's possible to create a financially viable garage that makes parking hassle-free. 



Stan Bochniak is a Regional

Marketing Director at ABM

Industries. A graduate of

California State University, Northridge, Stan began his professional career in the banking industry in both sales and operations. Since 1993, he has worked in the parking industry, the last 19 years with ABM. His wide range of responsibilities have seen him in the positions of facility manager, regional manager, and regional business development manager for ABM's parking services.



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THE THREE BRANCHES OF DESIGN

A look at history provides
a glimpse of the future

BY BRADY MICK

Occasionally, in times of chaos and change, there is value in reconsidering and reevaluating foundations for a previously conceived or discussed idea. Facility design is one example of where this process applies. As workplace design continues to morph between the challenging demands of being more efficient and effective and providing a greater experience for people, everyone involved can gain value in design considerations by looking back in time.

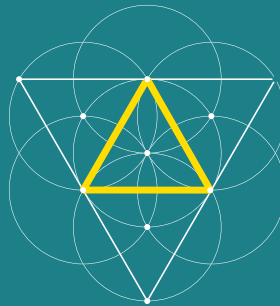
According to the ancient Roman architect and author, Marcus Vitruvius Pollio (De Architectura, 15 BC), architecture consists of three requirements: strength, unity and beauty.

They were referred to as the Vitruvian Triad. While the manifestation of these three constructs may have changed over time, it's important to evaluate how a re-balancing of strength, unity, and beauty can impact the future value of workplace design in a positive way.

STRENGTH
firmitas

UTILITY
utilitas

BEAUTY
venustas



In architecture, these three applications have been recognized for centuries. However, like with anything, translations of these constructs have varied, values have shifted, and the relative importance of each has been questioned. Nevertheless, Vitruvius's three design constructs play into most of the decisions faced by a facility manager.



firmity

Latin for strength and durability. Represents construction of a foundation steeped in structural stability.

It also means building this foundation using quality tools, materials, and experience — leaving no room for bargain-basement thinking. Much of strength’s value in the past was focused on permanence, but how might this concept be perceived in the present? What is today’s version of firmity regarding office design? Obviously, this concept has been reevaluated to consider today’s needs. Strength in the modern workplace means being able to provide resilience over an extended period — maintaining its value over time. Strength also refers to materials and forms of construction, so even for the less permanent structures, there are varying degrees of strength. Consider also how strength can come from office design’s adaptability factor. Much of an office’s retained value comes from its ability to cater to the needs of its residents as times change.



utility

Latin for usefulness or utility. Think of this requirement as the building’s ability to predict and respond appropriately to the needs of its proposed residents.

A building’s function is separated into primary and secondary spaces. Primary refers to the main function of the building (e.g. rooms), and secondary space is what makes the building usable (e.g. hallways, toilets). In modern office design, the concept of function is hotly debated and negotiated. Many believe its significance should be applied only to structures like factories and mass housing — where the need for utility originated. Today, embedding tools such as technology, activity settings and mobile-ready furniture are creating a new demand for utility, which in many cases outweighs the two additional design drivers — firmity and venustas.



venustas

Latin for beauty. The element of beauty can be made apparent in the use of attractive materials, skilled craftsmanship, and keen attention to detail.

Before the 20th century, venustas was mandatory for most newly constructed buildings. But, since then, it’s been less of a concern, likely due to an increase in mass production. Vitruvius divided beauty into six basic concepts: material and refinement, ornament, proportion and geometry, appropriateness, meaning, and design and inventiveness.

OFFICE DESIGN EVOLUTION

The past 30 years, office design has taken workspaces from cubicles and c-suites to collaborative meeting areas and charging stations. Although some companies have been slower to change than others, today the majority have at least some percentage of space dedicated to collaborative efforts.

Beginning in the 1990s, it became tough to argue with the reality that work doesn’t always get done, or need to get done, inside the traditional office space. Most employees can accomplish their work remotely as long as they have a computer and an Internet connection. Thus, facility managers have been shifting their focus away from the offices, cubicles, and conference rooms that had comprised their “normal” for years. In modern workplace design, these managers are discovering a new “normal” — one that favors spatial variety, excellent Wi-Fi connectivity, and a technology-enriched, team-focused workplace. Broadly speaking, there has been a relaxing of the workplace. As such, the time has come for designers to create environments based on the reality of increased collaboration, innovative behaviors, stand-up desks, and highly active, matrix-oriented work. Through this time of transition, it is advantageous to return to the roots of office design constructs to show how rebalancing the strength, utility, and beauty requirements can positively impact the future of workplace design.

CHALLENGES IN FACILITY MANAGEMENT

Being challenged by the virtual workspace comes in the form of issues such as managing remote employees and contractors, supplying the necessary equipment for virtual meetings, designing flexible work options, and satisfying the demand for increased shared space and collaboration tools.

So, what does “firmitas” mean to this virtual workspace?

“Facility managers are always looking for strength,” says Brian Collins, a facility manager at Microsoft. “They are always attentive to how their buildings look, but especially how they can be maintained and sustained. This is considered a strength.”

Collins goes on to describe how facility managers struggle with the role of design in office space and how popular and prevalent it is becoming. “Managing office space when there is such a variety of options, along with the lifespan of some of these designs, is challenging to say the least.”

Utility is arrived at by measuring judicious distribution of the parts. However, today’s parts don’t consist of offices, cubicles, and conference rooms. Today, utility requires far fewer private offices. In fact, even the need for each employee to have an assigned seat requires serious questioning. Cubicles are, at best, 50 percent occupied by assigned individuals at any given time during a typical workday. Also, it’s not uncommon to measure 10 percent of assigned offices as vacant and as many as 80 percent of total conference room chairs as “not in use.” Open collaboration and an environment suitable for innovation are becoming basic requirements in office design — creating a new set of utilitas challenges that include privacy, distraction isolation, personal identification, and management re-definitions of good work behaviors.

Finally, looking at the role of venustas, much of today’s failure in workplace design comes from a lack of beauty, brand identity, and basic design quality. Generic cubicles, drab office design and anything else that makes an office look basic and unspecific distract from an accepted standard of beauty and aesthetic appeal to which any facility manager should aspire. By thinking in terms of how the parts make up the whole, the ideal is that a workspace will be designed that represents one company exclusively — without sacrificing its visual value.

According to a Business News Daily article, “10 Biggest Challenges for CEOs in 2017,” workplace design matters. It’s on the list at number nine, and the virtual workspace is a legitimate challenge. Furthermore, it’s the only one of the ten concerns listed that is solely within a company’s control. The other nine are focused on stress reactions that come from the external environment:

1. New political administration
2. Costly health insurance
3. Rising cyber security threats
4. Finding capital
5. New hiring
6. The economy
7. Consumer expectations
8. Marketplace competition
9. The virtual workspace
10. Market oversaturation

LOOKING AHEAD

On architecture’s timeline, office design has repeatedly met obstacles in its attempt to meet people’s expectations. In today’s workplace, walls continue to come down — a factor that can be measured as a business’s advantage. The open office has its share of human behavioral advantages, which can be weighed against the three design constructs to help arrive at a high value equilibrium. For one, facility managers have to evaluate that fine line between inspiring collaboration and reducing concentration and productivity. The answer depends upon the nature of the business and the degree of creativity required from the employees on a daily basis. Also, the idea of open design is a firmitas cost advantage in that it reduces construction, lowers heating and cooling expenses, and cuts back on equipment purchases due to the shared spaces. This should be juxtaposed with the values of utilitas and venustas as equal business advantages to determine its contribution to work productivity.

As the design industry continues its attempt to satisfy the new workplace, it will always have to deal with tensions between designing for personal preferences, designing for one-size-fits-all, and most recently designing for non-descript activity and variable settings. A balanced consideration of the true potential of design requires an investment in time for all stakeholders. In the end, every facility manager knows that regardless of where we are in the evolution of facility design, ulti-

mately the value comes from providing areas conducive to productivity.

FINDING EQUILIBRIUM

Strength, or structural stability, arises from carrying down foundations to a good, solid bottom — as well as choosing the proper materials without being frugal. Utility, or using space appropriately, comes from judicious distribution of the parts so purposes are duly answered. And beauty, or the attractive appearance of a space, is produced by the pleasing design and good taste of the whole — as well as dimensions of all parts being balanced. Although emphasis of these constructs has changed over time, each of the three affects design results. Each can be rebalanced or redistributed to unite with the open collaboration of modern workplace design. FMJ



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- Help develop an FM Academic Program in your region.
- Become involved in the Facility Management Accreditation Commission (FMAC) and help lead and develop FM programs become Accredited.
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LIGHTING THE INFRA STRUCTURE GRID

There is no building element more ubiquitous than lighting — there's a light fixture roughly every 10 to 20 feet. Beyond being the most common element within a building, lighting has the unique aspect of being regularly arrayed into a grid. As we move to a more connected world, lighting provides a ready-made infrastructure for providing power for sensor technology to interface with plug loads, HVAC, and non-energy capabilities like asset tracking. New advances in lighting equipment and sensors allow for not only energy savings, but also non-energy features that can benefit and enhance facilities.

BY MICHAEL MEYER

OCCUPANT COMFORT

With the increased penetration of LED lighting, the illuminance, which is the amount of light falling on a surface, has been re-evaluated. Although illuminance does not entirely represent the quality of the overall visual scene, it does provide a good indicator, and it is the easiest value for designers and engineers to calculate and measure. Thus, it is the metric that the industry often uses for lighting recommendations and evaluations within a space.

As new LED lighting is installed, sites are re-evaluating their current lighting illuminance levels based on their situation and needs. Some spaces may have been over lighted in the past and a change in lighting technologies allows a fresh evaluation of existing conditions. Further, new lighting is more adjustable in output and different lighting levels can be more easily obtained.

However, some LED fixtures lack proper optical controls or are poorly designed, which can result in glare or make the space feel too bright. To reduce the glare and brightness and to make the space more pleasant for occupants, the illuminance within the space is sometimes reduced from its previous levels. However, occupant comfort and industry guidelines should be consulted if the illuminance is significantly reduced.

With fluorescent technology, the physics of the lamp allowed light in discrete amounts (for example, 2900 lumen lamps or 3100 lumen) and lamps of the same wattage from different manufacturers all basically produced the same amount of light. Options to vary the amount of light

output of a lighting system were either limited to adding or removing tubes, or costly by installing dimming systems.

However, the wide-scale introduction of LED lighting systems has changed the ability to vary light output, and this has led to additional discussions about light output. Most LED fixtures or retrofit kits leave the factory with a built-in dimming driver. Thus, with the proper control signal, these new LED fixtures can easily be dimmed. Product data sheets also list multiple light output options for virtually every LED product sold.

WHITE-TUNABLE

Beyond dimming LED systems, color-tunable technology is gaining ground. Certain light fixtures can adjust the color appearance of the light. This is known as CCT, or correlated color temperature. CCT is rated in terms of Kelvins (K), with low values appearing warmer, or white with a yellow or orange tint, and high values appear cooler, or white with a blue tint.

A neutral CCT is 2700 K to 3500 K, where halogen is 3000 K and fluorescent is often 3500 K. CCT values greater than 4000 K are characterized as cool (white with a blue tint). Metal halide, some LED fixtures, and daylight often fall in the cool CCT category.

Researchers from the University of Mississippi and University of Texas assessed the reading fluency of third-grade students under two conditions: high illuminance (≈ 100 fc) with high CCT (6500 K) lighting and typical elementary school lighting conditions (≈ 50 fc and 3500 K).¹

KNOW YOUR LIGHTING ACRONYMS

CCT

Correlated color temperature, a measure of light color

fc

Foot-candle, a measurement of light intensity

LED

Light-emitting diodes, a lamp technology

TLED

Tubular LED, designed to replace fluorescent lamps

The study found a 36 percent improvement of fluency performance under the 100 fc / 6500 K lighting condition, while there was a 17 percent fluency performance under 50 fc / 3500 K lighting conditions. The research did not examine the variables individually, so it is unknown if the change in CCT, change in illuminance, or the combination of the two could be behind the higher fluency. However, varying the visual scene can help direct focus.

Moving from the classroom to a business, there is significant interest in the use of varying CCT in office and industrial spaces. The basic idea is humans evolved under daylight, which varies by time of day and year, so mimicking this change in electric lighting may have benefits to occupants in the space.

These types of adjustments would have been laborious and costly to do with fluorescent lighting. However, this feature is enabled by some LED lighting. Although marketing departments of many lighting companies espouse the benefits of color tuning throughout the day, it must be kept in mind that the research on potential benefits is still ongoing and inconclusive.

Varying the color appearance across the day could be used to draw or retain focus in class or break up the monotony of the office day, but monetizing increased focus or disruption of the monotony of the work day into tangible benefits, such as improved test scores or task productivity, is challenging for researchers. That being said, making a space more pleasant, and improving the mood of occupants, is always desirable. Most would agree that this can be done through delivering the correct amount of light and the desired lighting CCT for the task in a space, and reducing glare.

PRODUCTIVITY AND EFFECTIVENESS

Any claims of substantial changes in productivity (which is output compared to a unit of work) as a direct result of new lighting should be viewed with skepticism. Claims abound that using color-tunable light could increase productivity by 10 to 20 percent.

First, many items can affect worker performance, including noise, temperature, lighting, bonuses, non-financial incentives, and social elements (for example, Cyber Monday, March Madness, etc.). Because many variables can affect worker performance, claims of double-digit increases in productivity must be carefully evaluated.

Second, although the amount of light, shadows, color, glare and flicker can affect worker performance, the lighting in U.S. spaces exceeds (far exceeds in some cases) the bare minimum lighting needs affecting performance. Therefore, changes in lighting should not lead to significant (double-digit) enhancements, but maybe marginal improvements in worker productivity. In contrast, features of new connected lighting could make staff more effective via asset management, space utilization, or other features.

NON-ENERGY BENEFITS

Asset management is a non-energy benefit that could be offered via connected or smart lighting. Using physical tags — such as radio-frequency identification (RFIDs) or Bluetooth Low Energy (BLE) — on physical objects, sensors can be mounted on and powered by the light fixtures across the space to help track assets.

Retail examples of this include tagging inventory. As the inventory leaves the distribution room within a store, it is tracked to the sales floor. Or tags can be placed on hangers for clothing, so that if the hanger and clothing are moved during the day by a customer, it is being counted. At the end of the day, the sales team has a better idea of the interest in particular items, counts of items, and where misplaced items may be located within the store. These tags have the potential to add value and free up staff time for other tasks.

Similarly, hospitals are exploring asset tracking. Nurses spend an aggregate of 1 to 2 hours per day looking for equipment.^{2,3} As a result, anecdotally, hospitals often overbuy equipment to address this problem. Sensors mounted on the light fixtures could help track tagged equipment and inform the nursing staff where the equipment is located.

In both the retail and healthcare scenarios, light-powered and mounted sensors help staff to be more efficient, although it is difficult to quantify exactly how much of a time savings staff would experience and thus still too early to directly monetize asset tracking.

Beyond making staff members more effective, the use of physical spaces can also be made more efficient via connected lighting systems through space utilization. Some new occupancy sensors go beyond simply determining movement and can count the number of people in a room.

Another way to count room occupants is via RFID or BLE tags placed in staff ID badges that can communicate with sensors connected to the lighting system. In either scenario, the connected lighting system can provide feedback to management about how effectively spaces are being utilized. The cost of the space easily dwarfs the cost of energy.

For example, if two conference rooms are each used in a space, but only a portion of the day and with little conflict, one of the conference rooms could possibly be eliminated or repurposed. Again, because lighting systems are evenly spaced throughout the building, they can serve as an avenue to provide this information if the correct sensors are installed.

Beyond making staff or spaces more effective, connected lighting can interface with the mechanical system and plug loads. If the new sensors can count bodies, they can interact with the HVAC system. The advantage to the mechanical system is that additional savings can be achieved from the sensor by changing the temperature or air flow to better account for the actual number of bodies in the room. Then when the room is empty, the sensors could dim or turn off the lights or direct a building management system to turn off certain plug loads or adjust HVAC system settings.

New connected lighting is the key to delivering these benefits and additional functions to the building occupants

as well as building systems. Remember, unlike virtually everything else in the building, light fixtures are abundant, distributed throughout the occupied space, and equipped with a power supply. These features make lighting an ideal platform to house and power sensors that allow for the capabilities previously mentioned. However, the key is in the selection of lighting technology that allows for these expanded capabilities.

SIMPLE OR SMART LIGHTING

The first consideration when choosing a lighting system is whether the equipment should be simple or smart. Simple lighting equipment provides lighting but no other secondary capabilities such as lighting controls, sensors, light color changing ability, or any feature beyond on/off of light output. Tubular LEDs (known as TLEDs) are probably the most common type of simple lighting. Many facilities are opting for this technology because of the low first cost, but very few TLEDs offer the smart capabilities that could add other benefits to the space.

In contrast, retrofit kits and new luminaires are often available with some type of sensor embedded in the fixture. At a bare minimum, these sensors allow for basic occupancy sensing or daylight harvesting features to control the light output. However, many manufacturers also offer smart sensors and other features that allow for the lighting system to become connected to building management sys-

tems or to the larger inter-connected world.

Significant energy savings can be achieved from connected lighting, and these savings can help offset the first costs of equipment and labor to install the new equipment. The industry is just starting to develop methods of monetizing certain non-energy benefits — for example, the value of asset tracking per square foot. The U.S. Department of Energy's Better Building Alliance and Solid-State Lighting programs are conducting research and aiding in these areas.

IFMA is a partner with the DOE in the Interior Lighting Campaign, or ILC. Participants in the ILC saved between 40 percent to 80 percent of the energy used by the original system through the installation of high-efficiency lighting systems. Energy savings are often the only metric used in lighting upgrade decisions. Savings this large should be used to leverage the installation of new lighting systems — ideally connected systems that offer additional benefits. **FMI**

Michael Myer is a senior researcher with Pacific Northwest National Laboratory (PNNL). PNNL is a U.S. Department of Energy national laboratory. Michael is the technical lead for the Interior Lighting Campaign and focuses on energy efficiency in lighting. He also supports DOE related to energy codes, appliance standards, and market transformation.

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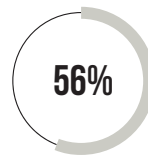


ACHIEVE THE FM ROYAL FLUSH
WITH THESE FIVE IMPROVEMENTS
TO RESTROOM MAINTENANCE

BY KRIS ALDERSON

It's no secret that the condition of public restrooms makes a big impression on its users. When facility managers examine how badly maintained restrooms affect the psyches of valuable stakeholders — customers and employees — it quickly becomes evident that restrooms represent a unique power center within facilities.

Restrooms can either be significant business detractors — or attractions — as many, if not most, people believe the state of the restroom speaks volumes about rest of the establishment. In the United States, 56 percent of adults said they are unlikely to return to a business after experiencing unpleasant restrooms, according to the 2017 Healthy Hand Washing Survey by commercial plumbing fixture company, Bradley Corp. Other respondents said they complain to management, tell a friend, post a comment on social media or leave right away without completing their business.



OF ADULTS IN THE U.S. ARE
UNLIKELY TO RETURN TO A
BUSINESS AFTER EXPERIENCING
UNPLEASANT RESTROOMS

In contrast, there's a positive bottom line to providing pleasant restroom environments: repeat customers. In the same survey, 70 percent of respondents say they have made a conscious effort to select a business because they know it has restrooms that are cleaner and better maintained. That number is even higher for millennials — 77 percent of respondents aged 18-34 say they've patronized certain businesses because they have cleaner restrooms.

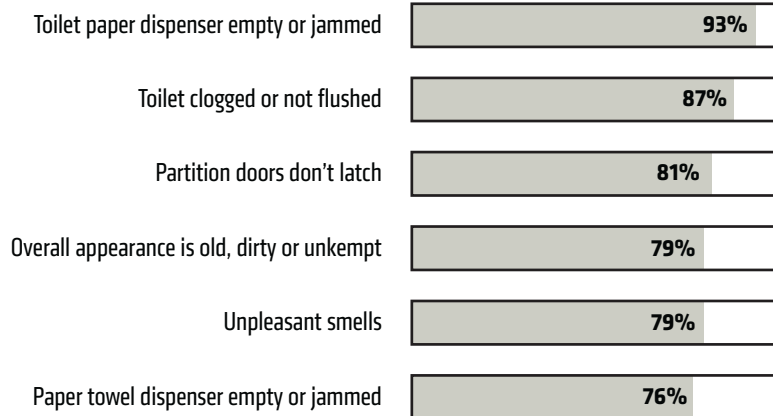
Expectations for a business' restrooms are clearly tied to customers' perceptions of the quality of the goods or services. According to the survey, 92 percent expect that a business that provides high-quality products or services would also have restrooms that deliver a high-quality experience. Likewise, expectations for restrooms in work settings are high, as 89 percent of respondents believe the condition of a workplace restroom is one indicator of how a company values its workforce.

When facilities fail to deliver on these expectations, there is a risk of getting labeled negatively in the minds of customers and employees. More than half of people surveyed believe that an unclean restroom indicates poor management, shows management doesn't care about its customers, and it causes them to lower their opinion of the business.

How can facility managers combat a restroom image problem? Consider these insights to hone restroom appearances — and customer relationships.

TUNE IN TO TURNOFFS

The most prevalent restroom pain points stem from common maintenance issues. Most respondents named the following restroom circumstances as “Extremely or Very Aggravating”:



Moreover, when asked about their most embarrassing restroom situations, respondents identify encounters that could have been headed off with proactive maintenance. The two most mentioned humiliations are someone opening the stall door while they're using it – likely due to broken latches – and discovering the toilet paper dispenser is empty.

CATER TO THE GERM AVERSE

People don't like touching things in public restrooms. In fact, to avoid contacting surfaces, they utilize all sorts of techniques such as employing their foot to operate the toilet flusher, using a paper towel to grasp the door handle, and hovering over the toilet seat.

When asked about the most important improvement they'd like to see in restrooms, survey respondents overwhelmingly replied, “clean them more regularly.” After that, they want more touchless fixtures and better stocking of supplies, including toilet paper, soap, and paper towels.

Certainly, today's tight operations and maintenance budgets may leave less time and resources for keeping up with cleaning and maintaining restrooms. However, businesses that cut corners are alienating their customers. Maintenance priorities should include regular cleaning, sanitization and stocking, with special attention to picking up garbage, keeping countertops, toilets and floors clean and dry,

and using air-fresheners to maintain a pleasant-smelling environment.

CONSERVE TO CUT OPERATING COSTS

Newer hand washing fixtures incorporate hands-free infrared 0.38 gallons per minute (gpm) faucets that reduce water usage by 24 percent over 0.5 gpm faucets, and they save even more in buildings that use 1.0 gpm or more. These high-efficiency fixtures provide long-term operational and environmental benefits, saving thousands of gallons of water annually, and consume less hot water than traditional commercial faucets.

High-speed touchless hand dryers help promote the hygienic benefits of hand drying, but without excess paper waste and expense — or the extra maintenance. Newer models are also highly energy efficient, using 80 percent less electricity than older hand dryers, while drying hands in as little as 10 to 12 seconds.

Frequent restroom checks and cleanings, along with updating restrooms with newer technologies, can help address the biggest pet

peeves in public restrooms. Improved hand washing technology and materials create a healthier and more welcoming restroom environment, while their water-, paper- and energy-saving features minimize operating costs. In all, improving commercial restroom design pays dividends in operational savings — and customer satisfaction.

INSTALL TOUCHLESS FIXTURES

Further demonstrating peoples' dislike of germs, the survey found that restaurants and health care facilities are the top places at which respondents are most concerned about somebody not washing their hands. Interestingly, restaurants cause even more anxiety over hand washing and germs than a medical establishment. Grocery stores, schools, airports, highway rest areas and offices are other places that draw concern.

In response to this aversion to germ-ridden surfaces, many facilities are already using touch-free restroom fixtures to minimize touch points. While reducing the transmission of germs and bacteria from users' hands, touch-free fixtures can also elevate hygiene in the overall facility as users leave the restroom area and enter other parts of the building.

Employing touchless fixtures helps facilities gain compliance with the Americans with Disabilities Act (ADA). This act requires that faucets are operable with one hand, without tight gasping or twisting and should be activated using a maximum of five pounds of force. Capacitive-sensor controlled faucets meet this requirement and minimize user frustration because the entire spout is an “omni-directional” sensor field that detects a user's presence from any angle of approach.

Touchless fixtures also help staff keep restroom elements in good working condition. The “hands-free” design reduces wear and tear from repeated usage, while curbing vandalism attempts such as leaving a faucet running to overflow. Sensored faucets prevent excess water spills with an automatic shut off.

New generation hand washing fixtures incorporate completely touchless designs, providing “smart” soap, faucet and

hand dryer in one space for greater convenience and accessibility. This all-in-one design also keeps water in the basin to eliminate water dripping on the user, walls and floor.

UPDATE BUILDING MATERIALS

In addition to regular cleaning and maintenance, there are also steps building owners can take during construction and renovation to optimize the condition of restrooms.

The look, function, efficiency and sustainability of today's commercial restroom design continue to be enhanced by new technology, materials and product design innovations. Designed with architects and designers, building management and staff, and restroom patrons in mind, next generation restroom materials and furnishings provide many benefits.

Countertops, hand washing systems, faucets, hand dryers, partitions, toilets, accessories, lighting and paint color will optimize cleanliness, maintenance and convenience, while elevating aesthetics. Over the lifecycle of these high-performance fixtures and materials, they will lower operating costs due to less frequent cleaning and replacements.

Restroom products now incorporate more sustainable materials, which are made of natural and recycled materials. Many are GREENGUARD-certified and can contribute to LEED credits. Sustainable materials can also increase the durability, maintainability and life span of these products.

Newer sustainable materials for washbasins include a molded natural quartz material that can be sculpted into a range of design options. Natural quartz is virtually maintenance-free, since it does not require sealing, buffing or reconditioning like granite. Solid surface materials made of recycled materials and rapidly renewable material is also a popular sustainable choice. Solid surface materials resist stains, chemicals, scratches and heat, which reduces the likelihood of repairs and the need for replacements. Both natural quartz and solid surface utilize integrated bowl designs, which eliminate crevices for microbes to hide, and they are easy to wipe down and help prevent the spread of germs. FMJ

Kris Alderson is senior marketing manager for Bradley Corporation of Menomonee Falls, Wis., a USGBC member and manufacturer of locker room products, plumbing fixtures, washroom accessories, partitions and emergency fixtures.

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the millenials myth

Employees are not getting what they should from their corporate workplaces, which is reflected by the fact that only **57 percent** of employees surveyed by research firm, Leesman, agree that their workplace enables them to work productively. The company's latest research unearths five key factors that influence workplace performance, arming leadership teams with key insights into how to reclaim the value which is currently being lost through inadequate workplaces.

BY CHRIS MORIARTY





The purpose of a workplace should always be the starting point for its design. Starting with data provides a much better chance of a good result. A good workplace design brief will contain hard facts and a specific set of criteria which define the ultimate function of the space, but too often there's a focus on "form" more than "function." Both are important, however, injecting data — facts — into the process gets the result that Frank Lloyd Wright would have described as "form and function are one." In other words, workplaces that are simply and elegantly effective.

But, of course, it's not that simple. Effective workplaces are difficult to create and manage. There is often something that seems to muddy the waters — a half-truth peddled so often that it appears to have become fact. Attend any workplace conference and you are virtually guaranteed to be subjected to a talk on the needs of millennials not being met. The storyline is that this group are so different from their older colleagues that they need special consideration. They are often pointed to as a disruptor of current workplace thinking, with many commentators challenging organizations to get themselves "millennial ready."

millennial myth-buster

Let's put that to bed then. Research has shown there is no solid evidence that millennials have any peculiar needs or are particularly disgruntled with their existing workplaces. None. It is what are called "demographic diversions" in the recently published report, *The Next 250k*.

In that time, and with the benefit of this large data set, there was not anything that suggests that millennials are rebelling against outdated workplace strategies. Why do these myths perpetuate? Real data must be used in design briefing to avoid negatively impacting decisions made when it comes to workspaces.

what is a millennial?

The millennial generation is having a growing influence on the world — well they would, like any previous generation. That is not news. But this perceived influence has prompted a host of businesses to focus on this group and to attempt to understand what makes them

different. With 50 percent of the world's population being under 30, the focus on this demographic is understandable. But, it's not a straightforward exercise.

The first challenge is that there is no specific date for this cohort. Researchers tend to use the 1980s as starting birth years and the mid-1990s to early 2000s as ending birth years. However, the World Economic Forum has recently released its 2017 "Global Shapers Survey," which encompasses the views of under-30s in 180 countries, and this study challenges stereotypical opinions about generational attitudes to work. It states that salary remains the most important criteria when considering a job, a "sense of purpose" coming in at second and an "opportunity for career advancement" ranks ahead of having a good work-life balance. So, that's their attitudes, but what about how they're working?

Millennials are often labelled as "disruptors" in the workplace, but in reality, this isn't the case. Think about any workplace; what are the "millennials" doing? Are they in such a position within the organization that they are fundamentally changing the way everyone works? It would be surprising if they already gained that level of influence.

what's the evidence?

Leesman research found no evidence that millennials are rebelling against their workplaces. In

fact, those in the database under the age of 34 are the age group who are reporting the highest satisfaction with their workplace environments. So, this fixation on workplaces not being "fit" for millennials is misplaced. This myth also has the potential to cause further damage, as there's the risk that the older members of your workforce will be ignored, despite the fact they are less satisfied with the workplace offering.

But these millennials work differently, right? Again, the data says otherwise. Often, we're told that younger generations want to work in a more flexible, agile way. However, recent research on activity-based working (ABW) — where employees can select a series of different spaces that best supports the particular activity being undertaken — reveals that millennials are, contrary to the popular headlines, the least likely group to work in an activity-based way, and they are instead the most likely to sit at the same workstation to complete their daily tasks.

We constantly hear of young people's supposed desires for beanbags, sofas, imported grass, fashionable artisan coffee offerings and the occasional slide or swing. But the evidence of demand, let alone need, is not there to back up this assertion. And if the recent headlines on Apple's new campus are anything to go by, they are not helping people to work effectively or remain satisfied. Instead, research is pointing in the direction of the real challenge — to create workplaces that are able to support a wide-range of different tasks. For all.

As individuals progress through their career, the number of different types of tasks that form part of their average working days starts to accumulate and become more complex; and it is here that corporate

study stats

DURATION

7-years

FOCUS

Workplace effectiveness

EMPLOYEES SURVEYED

276,422 employees

WORKPLACES INVOLVED

2,160 workplaces

COUNTRIES

67 countries

SEE THE FULL REPORT AT

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workspaces are really failing. Leesman data shows that the more complex an employee's daily work profile, and the more activities they carry out, the more beneficial it is for them to work in a mobile way that utilizes multiple settings and areas — not just their assigned desk or workstation. Employees who do work in an activity-based way, in environments developed to support that workstyle, report higher levels of satisfaction and are more likely to report that the workspace enables them to work productively.

Overall, the adoption of activity-based behaviors in ABW spaces is woefully low, with 71 percent of employees stating they perform most or all their activities at a single workstation. The data suggests that this apparent failure to adapt to surroundings could be crippling the productivity gains organizations thought possible.

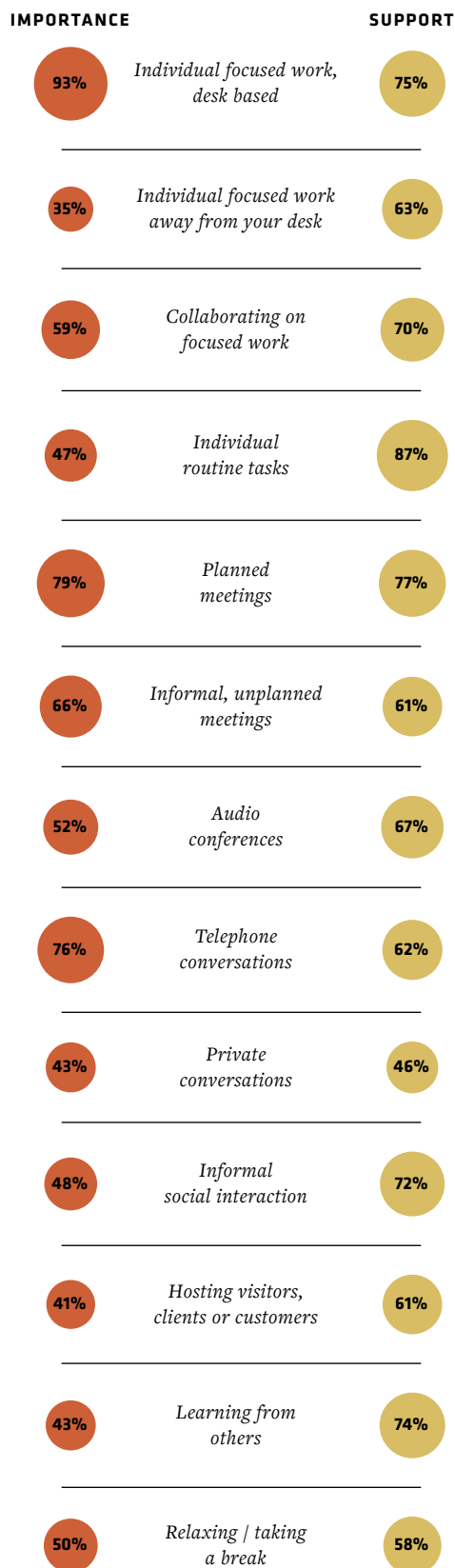
Despite commendable business intentions, employees are failing to adopt the behaviors necessary to realize the potential benefits of activity-based work models. This may merely be because the nature of their role doesn't require them to work in a mobile way, or it could be because the physical, virtual and cultural infrastructure does not actively encourage the appropriate mobility behavior. If activity-based working can be proven to further support the diverse needs of the workforce, employers must then provide the necessary support systems if their employees are to reap any benefit from such a transition. The key point here is that this cannot just be tailored to certain generations or demographics, it needs to be across the entire workforce.

we are all just people

Millennials — the very term is clearly a diversion. The newest additions to any workforce will have a simpler activity profile than an employee who may have spent over a decade at an organization. Designing workspaces purely for the youngest demographic risks disrupting the workplace for everyone

activity importance & support

Age group 35 to 44



else. The youngest and least experienced workers are the least likely to gain from agile or activity-based working. So, business leaders and designers alike should stop generalizing and instead look seriously at how we can make all workplaces better for employees of all ages.

Let us stop talking about millennials, shall we? Particularly when discussing workplaces and the mythical wants and needs of millennials with regards to their working environments — there is just no evidence to support it. The only fact is that they are younger. We are all just people, all different, but with many similarities. Organizations need to use evidence-based design, so form and function are aligned for all workplace users.

The workplace is awash with data. New technology solutions appear every week to measure, inform, aid response or automate processes, and it's easy to get lost in the noise and hype. The question organizations should ask themselves is: How many of these tools benefit the customer — the employee? Employee centric workplace solutions — those that understand the work profile of the employee and build a responsive and respectful infrastructure around them — are the workplaces that reap the highest productivity, pride and enjoyment results.

Great organizations build businesses that enable their employees to do their best work. And physical and virtual infrastructures are integral in this equation, so establishing a clearly communicated FM strategy helps you snub the propaganda and get to what is really going to make a difference for your business. **FMJ**



Chris Moriarty is MD at Leesman, the world's largest independent assessor of workplace effectiveness. Chris is passionate about helping organizations understand the link between people and place with the data amassed.



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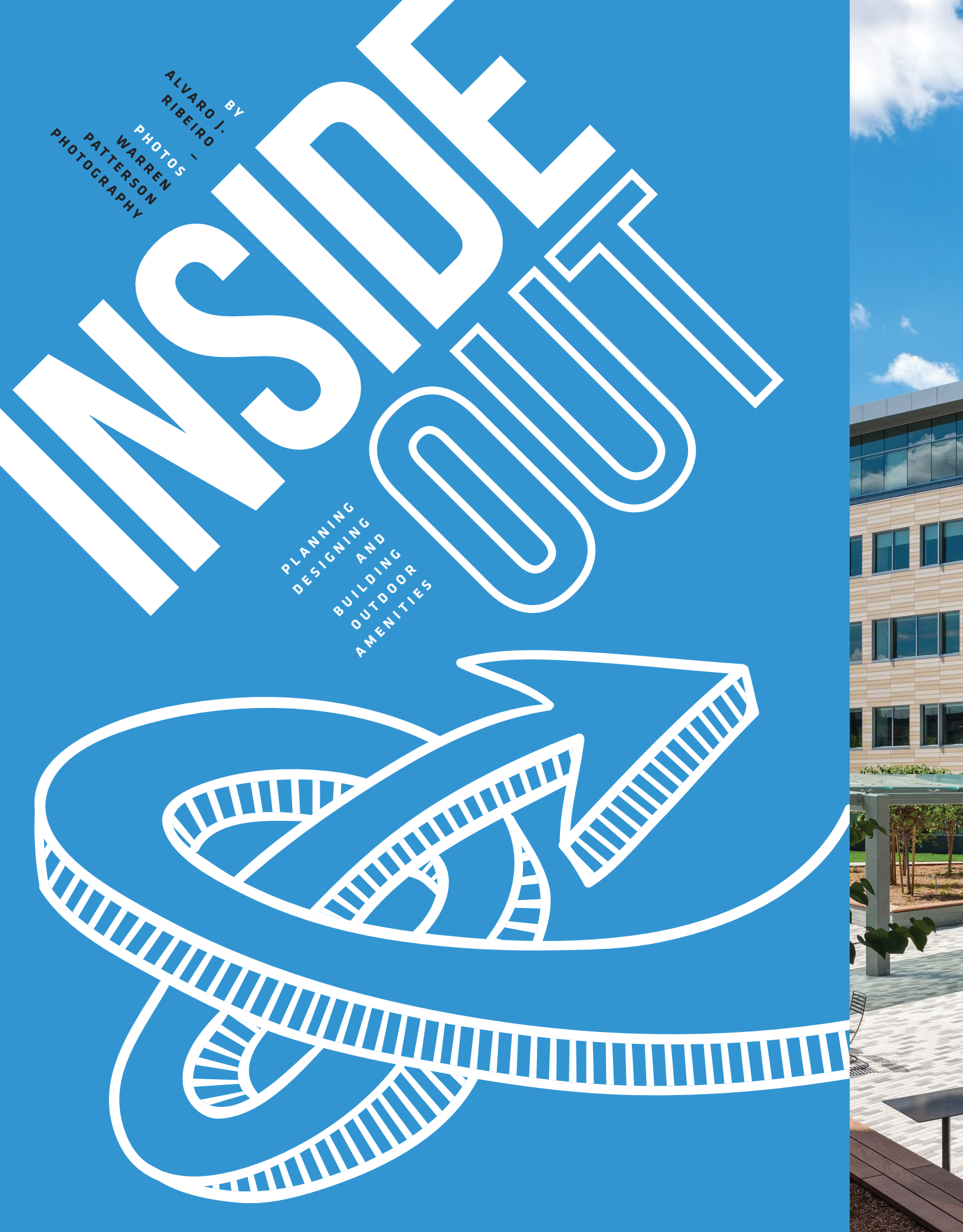
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PLANNING
DESIGNING
AND
BUILDING
OUTDOOR
AMENITIES





275 WYMAN STREET WALTHAM, MASSACHUSETTS USA

Hobbs Brook Management

This landscaped courtyard, free of vehicular traffic, affords tenants of this new suburban office building a vibrant social gathering space to host outdoor meetings as well as casual gatherings.

A building's curb appeal, image, and energy can make or break first impressions. Creating places for people to experience a property — whether it's first walking through a wonderful entry courtyard or just stopping to sit and talk — can cement a building's identity in a visitor's or prospective tenant's mind. This process of placemaking starts with thoughtful exterior design. Elements such as landscaping, canopies, and outdoor amenities are a valuable part of a building's identity. Creating outdoor amenities as an extension of the workplace is emerging as a national trend in major cities across the country, with real estate developers and facility managers playing a significant role in their management and operation.

Just as interior amenities such as corporate cafés, fitness centers, and game rooms are becoming common features, companies are beginning to tap into the value of outdoor amenities to make properties stand out, create inspiring and motivating exterior work environments, and to support a sense of well-being and community.

Property owners increasingly understand the important impact of attracting new tenants by integrating highly desirable amenities in new and re-developed office buildings. Building owners and tenants are keen to bring the outside in, often with features that stream natural light into the office and support plant-covered “living green walls,” for example. They are

also enticing people to work, exercise, and socialize more outside as well.

In urban areas, outdoor amenities such as roof decks and gardens, Wi-Fi-enabled outdoor seating areas, and access to bike sharing, are cropping up. In the suburbs, outdoor amenities like putting greens, recreational trails, and central courtyards draw workers outside at various times during the day.

Outdoor amenities are helping building owners, tenants, and facility managers address the values and habits of an evolving workforce, promote increased employee wellness, and turn real estate assets into a competitive advantage. All of it requires a coordinated effort and a shared vision between real estate owners, corporate human resources, and facility operations.

Successful Strategies

Competition for the best talent is fierce, and facility managers have a role to play in attracting and retaining employees. Forward-thinking organizations are re-evaluating their workplace strategy and appealing to talent by offering rich amenities that support well-being, provide a sense of community, help reduce stress and employee turnover, increase teamwork, and strengthen the company's vision and values.

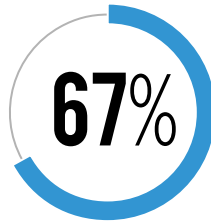
Millennials, in particular, desire amenities like roof decks, landscaped patios, casual seating areas with fire pits, and recreational spaces because of the social interaction and work-life balance these environments help create. Offering small communal settings where people can work, eat, learn and play is essential for increasing social interaction and employee engagement, both inside and outside the office.

In fact, when it comes to the top five ways to improve employee engagement, creating a sense of community ranks number one on the list. The physical workspace is an important aspect of promoting employee engagement, and companies understand that creative and innovative employees need flexibility in the work environment to do their jobs.

The Human Factor

Most employees spend 80 percent of their day inside, and sedentary lifestyles are known to negatively impact health. A 2017 study from Columbia University Medical Center found that being in the same position with little or no movement for 60- to 90-minutes over several hours each day increased the risk of early death — even in those who exercised.

However, even small changes in scenery and business practices can counter the neg-



companies have outdoor seating areas according to the Steelcase 360 Report on engagement and the global workplace.

The trend shows a successful workplace strategy includes offering a variety of interior and exterior communal settings that help drive individual productivity and wellbeing, as well as driving an organization's success.

ative effects of sedentary behavior. A 2015 study from the University of Miami Miller School of Medicine found that changing just one seated meeting into a walking meeting per week increased work-related physical activity levels by 10 minutes. Office workers participating in the study conducted weekly meetings in groups of two or three and were asked to wear accelerometers to measure activity levels over three weeks. The study suggests that modifying traditional seated meetings to walking ones is easy to implement and conduct during regular working hours.

Given that 80 percent of business operating costs are spent on people, many companies have turned their focus on how the workplace, and the ways we work in and out of it, can promote wellness for employees. Studies show that healthy employees perform better, take less sick time, and are far more productive. Companies have been responding to higher health insurance costs and the uncertainty of the health care industry for several years by investing in programs and strategies that help employees stay healthy. This next level of wellness will require re-imagining the modern office.

As wellness in the workplace evolves, so does the overall thinking about how building amenities can keep employees healthy and help them perform at peak levels — beyond offering health insurance or access to the company gym. That's why many landlords and property managers are now looking to make better use of the premium outdoor space surrounding their suburban buildings



BOSTON SCIENTIFIC GLOBAL FULFILLMENT CENTER QUINCY, MASSACHUSETTS, USA

Global Headquarters

The state-of-the-art facility expands and modernizes the company's logistics and distribution functions and aligns with the goals of the Boston Scientific Global Facilities Master Plan.

by creating gardens, outdoor rooms, and walking areas that support wellness and social interaction. Facility managers are weighing in on how companies can incorporate interior and exterior features that encourage employees to get away from their desk, move around more, and experience the physical, mental, and emotional benefits of fresh air and the natural environment.

With this goal in mind, more companies and building owners are beginning to offer outdoor recreational programming and walking trails that provide stress relief and opportunities for fitness. The global headquarters for Boston Scientific Corporation in Marlborough, Massachusetts, USA, offers an inviting environment to get fresh air and sunlight during the work day. The campus features a landscaped courtyard, accessible to and linking all four buildings of the campus quadrangle, and it provides a series of outdoor rooms and vegetated meeting areas. The landscaped courtyard is regularly used for small meetings or casual outdoor relaxation and company outings. At 101 Station Drive, a 208,000-square-foot re-positioned and renovated office building in Westwood, Massachusetts, the open lawn in front of the building is often used for tai chi classes in good weather.

Outdoor workspaces and amenities contribute to social and emotional well-being too. The dynamics of community and collaboration are being challenged with the rise of the mobile workforce. Shared outdoor workspaces are the bridge between traditional office space and independent remote work because they offer opportunities to gather, collaborate, and socialize in an open, natural, and relaxed setting.

Office buildings in major metropolitan areas are being transformed with the outdoors in mind. For example, Boston Scientific Corporation's new global customer fulfillment center in Quincy, Massachusetts enhances the employee experience with a variety of high-end amenities, including a waterfront roof terrace with adjoining full-service corporate café. As the jewel of the building, the 2,000-square-foot waterfront roof terrace, with Wi-Fi connectivity, re-configurable outdoor casual seating, and conference spaces, offers stunning views of downtown Boston and provides a compelling amenity for employees.

The O&M Viewpoint

Facility managers can play a critical role in the selection, use, and upkeep of outdoor amenities, as they are often most attuned to what amenities make the most sense for a building and the people working in it. They can also play a key role in advancing the building owner's — and tenants' — vision for the use of these shared outdoor spaces.

Facility managers bring valuable insight to issues such as understanding the structural requirements and permitting process for a new roof deck or the



**101 STATION
DRIVE
WESTWOOD,
MASSACHUSETTS,
USA**

National
Development

The fireplace and soft seating at 101 Station Drive recreates a setting more commonly found on an urban rooftop and completely transforms this suburban office building.

accessibility and connectivity needs for walking trails and outdoor meeting spaces. When it comes to deciding on what amenities to invest in, facility managers may be asked to think beyond the cost and consider the greater benefits outdoor amenities have on the potential to increase engagement and productivity, lower health costs, and reduce time away from work.

The maintenance and use of outdoor spaces in urban areas can significantly differ from those in suburban locations. Hosting events after-hours on a roof deck may require additional evening facility management staff to override lighting controls and monitor the security system, while accommodating lunchtime food trucks in the courtyard of a suburban office complex may require nothing more than scheduling. The timing of maintenance should also be considered, to make sure that the grass is cut for a fitness class or that sprinklers do not go on when people are congregating outside.

Finally, remember that outdoor amenities help distinguish office buildings as a marketable property and can be a deciding factor for discerning tenants. With rents on the rise in most cities, appealing amenities — both inside and outside — could make the difference in creating a leasable real estate asset for the building owner.

As more companies and landlords integrate outdoor amenities into office life, this workplace trend will continue to have significant impact on how facility managers operate and maintain exterior areas and grounds in the future. **FMI**



Alvaro J. Ribeiro, AIA, is a senior architect at Margulies Perruzzi Architects (MPA), one of New England's top architectural and interior design firms known for innovative workplace strategy and design. MPA creates buildings and workspaces that inspire creativity, attract and retain talent, and enhance mission engagement, and collaborates with clients in the corporate, professional services, healthcare, science/technology, and real estate communities to design productive and inspiring workplaces, now and for the future.



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BRINGING BUILDINGS TO LIFE

BY
BILL
CONLEY

Back before sustainability became a fact of life in the facility arena, to some people a “green” building evoked images of Ivy League colleges or the Hanging Gardens of Babylon — vines creeping up building walls and facades covered in plant life. At that time, the concept didn’t make sense. It sounded like aesthetic or historical affectations, not modern construction.

“Green” buildings are now part of the normal vernacular in today’s facility management world. The concept entails energy efficiency, conservation of resources, quality of life, and the ways and means to sustain business and ecology over time. However, if the word is taken literally and early preconceptions are revisited, sustainable buildings can be viewed from a much different perspective. Buildings can be literally green ... festooned and designed with living plants as part of the facility.

Integrating plant life and natural elements into the workplace to stimulate the senses is called biophilia. The term means “love of life or living systems.” Its premise is that people’s tendency to focus on life and lifelike processes might be a biologically based need, integral to humankind’s development as individuals and as a species. Research shows that subtle, sensory aspects relating to the outside world have a significant impact on the perception, collective well-being, productivity and profitability of a company. As society becomes more and more divorced from the natural world, biophilia provides a powerful argument for the conservation of biological diversity. More importantly, it implies serious consequences for mankind’s well-being. Nature has served as an indispensable part of human development. An “out of sight, out of mind” mentality could result in continuing environmental destruction that would have a significant impact on quality of life, not just materially but psychologically and even spiritually.

BIOPHILIC DESIGN

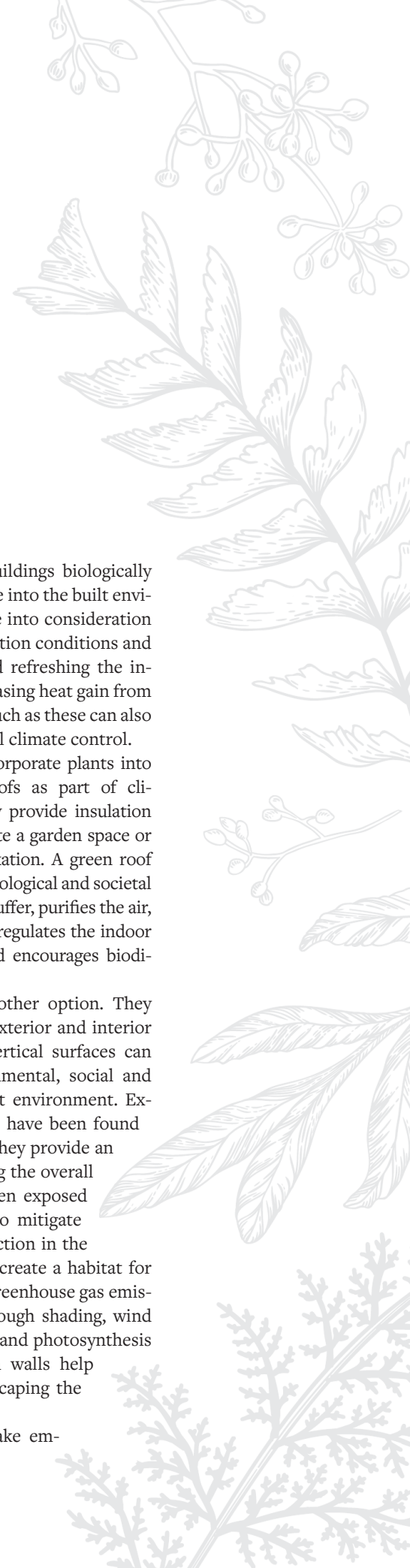
The rationale that encourages biophilic design is based on attributes in the workplace that are critical to people’s health and productivity, as well as their emotional, intellectual and spiritual well-be-

ing. The intent is to make buildings biologically lively and to incorporate nature into the built environment. It takes local climate into consideration to evaluate lighting and ventilation conditions and utilizes plants for cooling and refreshing the indoor environment while decreasing heat gain from the outdoors. Simple actions such as these can also reduce the need for mechanical climate control.

There are many ways to incorporate plants into buildings, including green roofs as part of climate-proof construction. They provide insulation for the building as well as create a garden space or natural lounging area for relaxation. A green roof has benefits at the economic, ecological and societal levels. It provides a rainwater buffer, purifies the air, reduces ambient temperature, regulates the indoor temperature, saves energy, and encourages biodiversity in the city.

Vertical green walls are another option. They can be installed both on the exterior and interior of a building. These green vertical surfaces can contribute significant environmental, social and economic benefits to the built environment. Exterior green walls and facades have been found to be energy cost effective as they provide an increase of insulation, reducing the overall temperature of a building when exposed to the sun. Exterior walls also mitigate outdoor climate through reduction in the urban heat island effect, they create a habitat for birds and insects and reduce greenhouse gas emissions. Climate is adjusted through shading, wind shielding, evapo-transpiration and photosynthesis processes. Additionally, green walls help reduce the amount of heat escaping the building during cold weather.

Interior living walls can make em-



ployees more productive, as they satisfy a primal need to be around nature. The appealing aesthetics and improved indoor quality have been shown to have a positive impact on the well-being of people within a facility. Introducing natural elements can lift the moods of personnel, helping them to be more alert and upbeat. As it happens on the outside, the transpiration process on plants can reduce temperatures during hot days, which works as an additional energy savings solution.

Other environmental features can be introduced when modeling building interiors. The workplace can be enhanced with indoor potted plants, sunlight, fresh air, water, landscapes, natural colors and natural materials, such as wood and stone. Shapes and forms that mimic the patterns and processes found in nature can also be used, as light and space can evoke the sense of being in a natural setting.

Visual access to the outside world is an important element of employee comfort. Allowing people to keep the sun in mind — via skylights, clerestories, solar tubes and windows with outside views — helps maintain circadian rhythms. Often referred to as the “body clock,” the circadian rhythm is a cycle that tells our bodies when to sleep, rise, eat — regulating many physiological processes. This internal body clock is affected by environmental cues like sunlight and temperature. When a person’s circadian rhythm is disrupted, sleeping and eating patterns become unsettled. A growing body of research is examining the adverse health effects of a disordered circadian rhythm, such as increasing the chance of cardiovascular events, obesity, and demonstrating a correlation with neurological problems like depression and bipolar disorder.

FM FACILITATORS

Facility managers should attempt to bring nature, buildings and human beings together in a higher unity within manmade spaces. People’s natural love and appreciation of nature helps sustain their existence, and biophilic design is about strengthening a connection with nature. Biophilia emphasizes the innately emotional affiliation of human beings to other living organisms. It helps supply an inborn need of connection to life and to vital organic processes. Defined as an environment that strengthens life and supports the sociological and psychological component, it provides a sense of calm that can help to unburden our cognitive system, supporting the ability to collect and recognize more information in the quickest and most efficient way.

Research group Heschong-Mahone Group studied a Sacramento call center that had an office with large windows overlooking trees and nature. Some employees had access to the view from their cubicles. They found the employees with a view of nature



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were six to seven percent faster at handling calls. After rearranging the workspace to give every employee a view of nature, they calculated the productivity savings at \$2,990 annually per employee.

Cardiff University researchers reported a similar relationship between nature and productivity in a European study. Comparing productivity in two offices, one with natural elements and one without, they found that the offices with natural elements saw a 15 percent rise in output amongst employees after three months. Workers also reported a 13 percent increase in higher level of well-being.

THE BUILT ENVIRONMENT

Human beings have lived in the natural environment far longer than the 200 years since the Industrial Revolution introduced drastic changes in our lifestyles. Nature cannot be dismissed lightly. However, as lives have become increasingly urbanized, the connections to nature have diminished. Human divergence from the natural world appears to have occurred in parallel with technological developments, with advancements in the last two centuries having the most significant impact. Such “progress” fundamentally changed human interactions with nature. In its most literal sense, this separation from the natural world has been empowered by the construction of enclosed and relatively sterile spaces.

As buildings developed over time, operable windows went away and HVAC systems became more prevalent. Air conditioning has taken the place of fresh air, artificially altering its properties to provide temperature and humidity control to create more comfortable conditions.

This led to the encapsulation of employees in a building envelope completely isolated from the outside world. Cement took the place of grass to accommodate transportation needs for commuters. All in all, concrete and steel have replaced the earth as it existed over time.

As cities continue to expand and high-rise buildings get ever higher, parking is, indeed, more and more part of man’s need to build more work and living space. Because of technological advances, and more time spent inside of buildings and cars, the lack of time spent in nature strengthens the disconnect of humans from the natural world. This engenders a stronger sense of disregard for plants, animals and open wilderness which could lead to further degradation of the eco-system.

The introduction of plants and natural elements in the workplace creates an ambiance that resonates with workers. The integration of the living, organic systems evidenced by green walls and green roofs contrasted with the inorganic and lifeless structures that comprise cityscapes may pave the way for a new type of “living” architecture.

INCREASING PRODUCTIVITY

Biophilic design in facility management aims at creating strong connections between nature and man-made environments, and it has proven benefits, including helping office workers be more productive, encouraging children to learn and helping hospital patients get better. In studies, introducing plants in a facility substantially improved employee performance on memory retention and other basic tests. It has also been shown that a natural environment gets employees psychologically engaged and leads to a happier mind-set and increased productivity.

It is estimated that a one percent increase in productivity across the board would pay the rent for leased buildings. A two percent increase could pay rent and utility costs. The algorithm is based on square footage, square feet per employee and salaries.

In one study, participants who had access to natural accoutrements were 12 percent more productive and less stressed than those who worked in an environment with no natural design elements. Studies have also shown that natural elements can decrease negative behaviors, such as aggression and anxiety, and they have been found to alleviate mental fatigue. Visual exposure to plant settings has produced significant recovery from stress within five minutes. These positive impacts are all attributed to the reaction on the human body to seeing and being around natural elements.

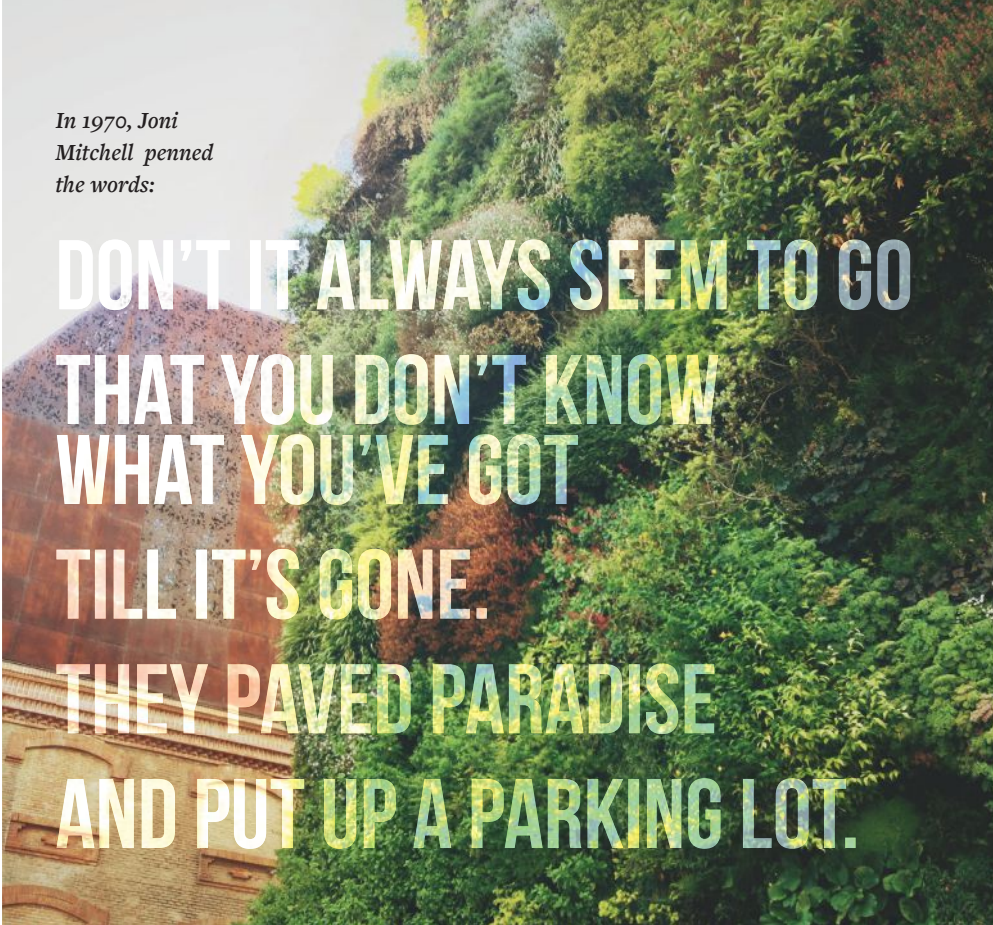
Indoor environmental quality (IEQ) is an important part of a facility manager's responsibility, for good reason. HVAC reliant, sealed office structures are often 10 times more polluted than outside air. Plants clean contaminated office air. It has been suggested that 15 to 20 plants are enough to clean the air in a 1500-square-foot area.

Plant material can also help reduce noise levels. Plants around the workplace can reduce noise by up to 5 decibels, which helps relieve the decibel distraction factor.

AND, IN THE END...

Numerous examples illustrate biophilia has a genetic component. After all, it's


In 1970, Joni Mitchell penned the words:



**DON'T IT ALWAYS SEEM TO GO
THAT YOU DON'T KNOW
WHAT YOU'VE GOT
TILL IT'S GONE.
THEY PAVED PARADISE
AND PUT UP A PARKING LOT.**

not called Mother Nature for nothing! Humankind's predilection to appreciate or fear aspects in nature as involuntary reflexes point to internal reactions to stimuli that are ingrained in the psyche. Mankind has a symbiotic relationship with nature that parallels existence. Life on earth wouldn't be here without the birds and the bees.

Every schmaltzy quote about living with nature, feeling the cycle of the seasons or being in harmony with the earth, happen to be biologically true. Bringing plants and other natural elements into the workplace serves a multitude of purposes and fulfills its own triple bottom line of physical, psychological and spiritual health.

It reminds people from whence they came as well as serves as a reminder that there is more to life than a concrete jungle. It has been said that one touch of nature creates kinship through the workplace. This awareness of natural surroundings may lead to environmental consciousness and sustained resource management. Biophilia is a call back to peoples' roots ... and it's only natural. 

RESOURCES

1. **Work Design Magazine Biophilia and Workplace Design** <https://workdesign.com/2012/07/biophilia-and-workspace-design>
2. **Human Spaces report Biophilic Design in the Workplace** <http://humanspaces.com/report/biophilic-design-in-the-workplace>
3. **Terrapin Bright Green biophilic research** www.terrapinbrightgreen.com



BILL CONLEY, CFM, SFP, FMP, LEED AP, IFMA Fellow, is facility manager at Yamaha Motor Corp. in Cypress, California, USA. Prior to that, he served as owner and chief sustainability officer of CFM2, a facility management and sustainability consulting company. Conley has more than 40 years of experience in the facility management profession 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. He has been a regular contributor to FMJ for more than 20 years and has authored more than 60 FMJ articles.



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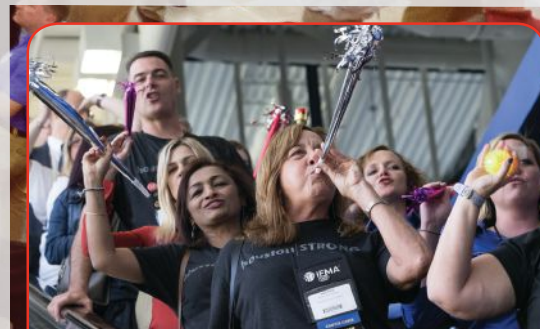
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BY IAN DEMPSTER

Water-Saving Synergies

HOW SMART HVAC
SYSTEMS CAN DELIVER
COST AND ENERGY
SAVINGS WITHOUT
DRAINING WATER
RESOURCES



Conflicts between **energy production** and **water availability** are on the rise, even in areas not traditionally associated with water supply constraints. These two critical resources are inextricably linked. The collection, pumping, conveyance, treatment and discharge of water requires large amounts of energy. Likewise, energy production uses large amounts of water for mineral extraction and mining, fuel production, hydropower and power plant cooling. And the demand for both resources is growing.

The World Resources Institute estimates that by 2050, global economic activity will increase fivefold, the global population will increase more than 50 percent, global energy consumption will increase nearly threefold, and global manufacturing activity will increase at least threefold. Balancing sustainability against conventional mass production creates conundrums for businesses and facilities. One of the biggest is how to spread the benefits of industrialization worldwide without creating unsustainable impacts on water and other natural resources.

HVAC SYSTEM IMPACT ON BUILDING WATER USE

Studies estimate that HVAC systems could account for three-quarters to half of a building's total water consumption.



28-48%

HVAC Systems



31-37%

Restrooms & Kitchens



18-22%

Landscaping

FACILITY SOLUTIONS

Building owners have to be part of the solution. They're already feeling the pressure: rising energy costs and concerns about global warming are forcing some water managers to seek ways optimize the energy efficiency of their water systems and reduce overall water use. One potentially large source of water savings that is often overlooked is HVAC systems.

When considering building water use, people immediately think of bathrooms, kitchens and maybe irrigation, and most stop there. But studies by the California Urban Water Conservation Council and the U.S. Environmental Protection Agency show that an HVAC system may account for 28 to 48 percent of a building's water consumption, with restrooms and kitchens using 31 to 37 percent, and landscaping accounting for only 18 to 22 percent. While water consumption varies by climate and building type, that's a huge source of potential water savings.

Fortunately, cutting this waste is a happy byproduct of optimizing HVAC systems to reduce energy consumption and costs. Improving the efficiency of a building's central plant (a large part of the HVAC system), including automating components for real-time optimal performance, can cut chiller water use by thousands of gallons.

HOW IT WORKS

Water savings from HVAC systems are linked with energy savings, which makes addressing the problem a two-for-one sustainability win. If a facility's cooling tower is using more than 3 gallons of water per ton-hour of cooling, the HVAC system is running inefficiently. HVAC optimization can cut that usage to 2.5 to 2 gallons per ton-hour of cooling while reducing energy use and costs.

Water loss from cooling towers comes mainly from evaporation, and secondarily from blowdown, which is the intentional draining of water from the system. As water evaporates, the dissolved solids in the water become more concentrated — and more detrimental to the system. Part of the reason operators perform blowdown is to limit scaling and fouling and to help get rid of bacteria. Legionnaires' disease, for example, emerges from mismanaged water systems, including HVAC systems. Managers have to add chemicals to stop bacterial growth and then perform blowdown to control dissolved solids and maintain required chemical concentrations. That water must be replaced with fresh water.

The size and efficiency of the chiller plant and how much the building gets cooled are the primary factors in a commercial building's water usage. When a system is more efficient, less water circulates and less water needs to be flushed out, reducing the need for chemicals. When chillers and pump motors function more efficiently, they transfer less heat into the plant's condenser system and thus reduce evaporation.

By improving plant efficiency from 1 to 0.75 kilowatts per ton of cooling, facility operators can cut water usage by 10 percent or more. The end result is cost savings, reduced chemical usage and a decreased carbon footprint.

HVAC optimization also reduces the amount of water the air handling system uses. Advanced optimization software can calculate the right amount of air to condition for a particular space at a particular time. For example, an optimized system might blow less air in the morning and increase the air conditioning as the building heats up during the day.

Reducing the level of cooling also helps,

AN OCEAN OF SAVINGS ...

Water savings from HVAC optimization depends on the size of the central plant, the amount of space being conditioned, the building's geographic location and the flexibility of the building's occupants. In large buildings with temperature flexibility, the savings can be huge:

 = 1 million square feet

 Annual gallons of water saved

 Cooling power (in tons)

UNIVERSITY CAMPUS



 570,800

 3,800

AIRPORT



 918,000

 7,000

BIOMEDICAL FACILITY




 1,509,000

 9,000

OFFICE



 1,200,000

 7,600

because it reduces evaporation. Buildings with some temperature flexibility — such as hotels, warehouses and offices — can save thousands of gallons if managers turn up the thermostat just a degree or two. For instance, nudging the temperature up from 67 degrees to 68 or 69 will reduce the load on air handling systems and cut back on the use of chilled water, and most building occupants won't feel a difference.

Optimizing chilled water production, reducing ton-hours of cooling and automating air handling in an HVAC system together can result in water savings of more than 20 percent, based on Optimum Energy project data. And it can reduce energy consumption and costs by 20 to 50 percent.

SELECTING TECHNOLOGIES

A good HVAC optimization solution will calculate the most efficient operation of the whole system — whether that's one building or an entire campus — in real time, automatically and continuously optimizing the performance of the chiller plant. It will also track savings.

In addition, new water treatment technologies can help building owners and operators better maintain their cooling towers, keeping the condenser system efficient and clean. These technologies include continuous cooling tower performance monitoring and data analytics tools that track the efficiency of both water and energy usage.

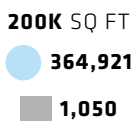
Non-chemical options for cooling tower water conditioning, such as ion exchange and electrostatic field generators, can also be helpful. An ion exchange column (periodically recharged with ordinary salt) can provide softened makeup water with the calcium and magnesium ions removed and replaced with sodium ions, which do not contribute to scale. Electrostatic field generators are a class of precipitation induction devices for water treatment systems that show some promise in reducing scaling potential and minimizing biological growth. These devices enable the precipitation of calcium without the formation of scale, allowing operation of the cooling towers with fewer blowdown cycles.

By improving plant efficiency from 1 to 0.75 kilowatts per ton of cooling, facility operators can cut water usage by 10 percent or more.

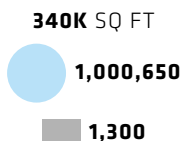
... FOR ALL FACILITIES.

Smaller commercial buildings and those with more exacting temperature standards can see impressive results through HVAC optimization as well, by varying factors such as water flows, pump speeds and fan speeds while maintaining set temperatures:

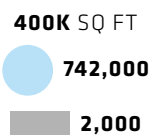
24/7 RESEARCH LAB



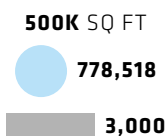
MANUFACTURING FACILITY



HOSPITAL



DATA CENTER



Owners should select a water treatment vendor based on their commitment to water conservation and the cost to treat makeup water and maintain a cooling tower to the highest recommended system water cycle of concentration. Make sure the vendor understands that water efficiency is a priority, and that the vendor has a solid reputation for results in this area. Not every vendor wants to serve a conservation-oriented client because that usually means selling fewer chemicals – and savings on chemicals is an indirect but not insignificant additional benefit of water conservation.

LEED OPTIMIZATION STRATEGIES

Taking advantage of these techniques to help ensure that an evaporative heat rejection system uses the least amount of water required will also ensure that the system is saving energy, help maintain optimized system performance, minimize system maintenance and maximize system life.

On top of those benefits, if a building's LEED rating is important, all of these measures provide additional LEED points.

Cooling tower water management has been part of LEED for Existing Buildings: Operations & Maintenance (EB:O+M) for years, but LEED v4 also brings it into the building design and construction (BD+C) rating systems, such as LEED for New Construction (LEED-NC).

Reducing water lost through blowdown is the focus of LEED v4's cooling tower credit. Projects pursuing the credit need to increase the number of cycles through which water can recirculate

before it is removed by blowdown. Depending on its chemistry, the blowdown water can be captured and reused in appropriate applications, such as irrigation — particularly if it is mixed and diluted with captured rainwater or other water sources. Taking this extra step earns the Cooling Tower Water Management credit, which adds up to two points for BD+C projects, and up to four for EB:O+M.

Optimizing HVAC systems to power buildings with the least possible energy and water use — while maintaining comfort and staying within required operating parameters — clearly has enormous financial and sustainability advantages. Realizing those advantages is becoming more and more urgent as water supplies throughout the world face growing demand. It is critical that all water-consuming systems — including hidden users like HVAC systems — optimize their use of this resource. FMJ

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Ian Dempster is senior director of product innovation at **Optimum Energy** and a certified energy manager (CEM). He directs multiple simultaneous R&D projects, drawing on a 16-year engineering career that spans three continents.

SAVE
THE DATE



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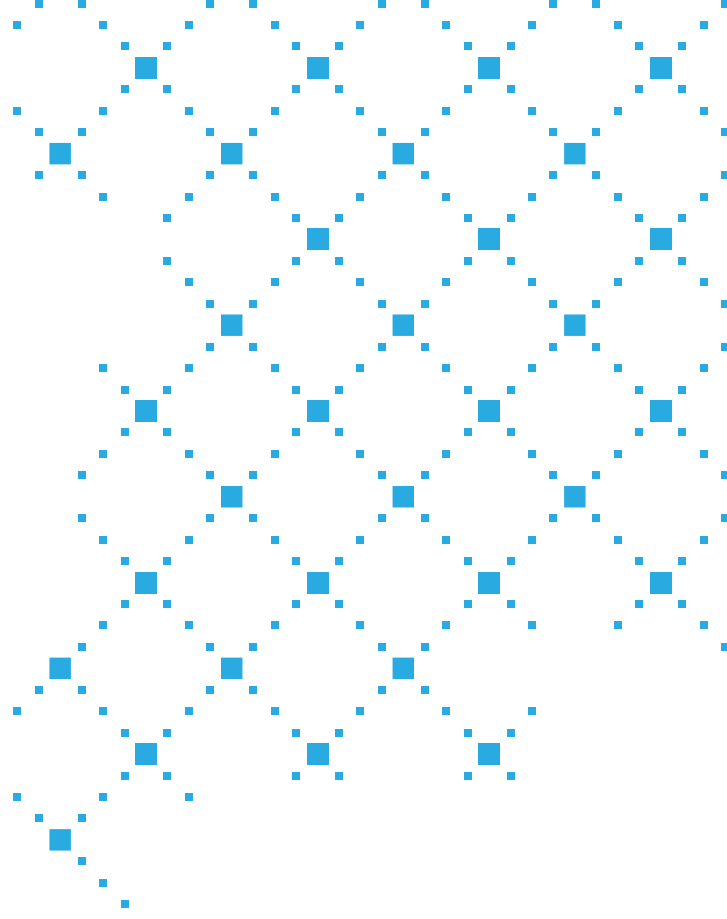
EXPLORING
NEW RESEARCH
FROM IFMA
AND JLL

BY MAUREEN EHRENBERG

In recent years, the Internet of Things (IoT) has transformed nearly every facet of our lives.

If you use a fitness tracker, a digital “learning” thermostat or a smartphone map application, you personally benefit from the IoT every day. Through embedded devices that send and receive data by way of the Internet from objects (or things) that we use regularly, the IoT creates real-time interconnectivity and the ability to automate. You may have already put the IoT to work in the facilities you manage, in the form of a smart lighting system, remote-controlled HVAC, digital security or a more interconnected building environment that responds and interacts with building occupants or facility employees.

Some experts estimate that as many as 1 trillion building sensors will be in place by 2025, or about 120 per every living person. For facility management professionals, the insights made available by the IoT could help make our buildings more efficient, sustainable and responsive to the needs of the people who live and work in them. In addition, the data we retrieve from the embedded devices can make the environments we create better, smarter, and more responsive and predictive. The property information we collect is valuable for budgeting, planning, forecasting, and new productivity and cost savings initiatives. So, having a strategy for collecting, storing and using data is an important part of IoT activation, planning and operations.




IFMA'S IOT RESEARCH

To understand what the IoT means for the FM profession, IFMA and JLL undertook a global research survey with 700 IFMA members, focus groups and interviews with the industry's leading subject matter experts. The resulting white paper, available on the IFMA website, reveals where our industry stands with regard to IoT adoption.

Overall, survey respondents identified an improved end-user experience as an important driver for IoT adoption, second only to improving building operations. More than 60 percent of IFMA members are somewhat or extremely knowledgeable about IoT, with nearly 70 percent saying your organizations are already using the IoT in some way.

To continue the discussion, IFMA has launched an IoT portal where FM professionals can interact to pool knowledge and best practices, and engage with other interested individuals and organizations relating to the IoT. IFMA also has created a dedicated task force to explore how FM professionals can exploit the vast potential of billions of interconnected physical things, each generating millions of data points.



More than 60 percent of IFMA members are somewhat or extremely knowledgeable about IoT.

THE HUMAN POTENTIAL

The global IoT survey reveals that FM professionals are most aware of the potential of the IoT as it relates to building automation, energy management, maintenance, security and physical access and safety. Until recently, that's what most of the IoT conversation was about, at least with regard to buildings.

However, the IFMA survey reveals growing awareness of how the IoT also can improve the human experience in the workplace — an impact that goes far beyond saving energy or the reduced maintenance costs that come from IoT-driven continuous commissioning.

And, the IoT has much to offer the human experience. As described by John Smart, a Smarter Buildings Strategist at IBM and one of our research interview subjects, “The IoT opens up a whole new world for cognitive workplace design, where building and

workplace systems can anticipate an individual's needs or desires and adjust accordingly.”

Exploiting IoT capabilities means expanding your focus beyond buildings and assets to encompass the people inside. We need to think big when it comes to the human experience: how can we leverage IoT solutions to help our end-users feel engaged, empowered and fulfilled at work, and, ultimately, happier and more productive?

New IoT technologies have created access to vast amounts of real-time data that connected devices generate. With the application of analytics, you can use this data to make workplace decisions. Data from an intelligent lighting system, for example, can show how many, how often and how long employees are using a particular work area, providing valuable insights for space planning and workplace strategy.

PUTTING IOT TO WORK

What the IoT will look like in your workplaces and properties depends on the business objectives of your organization and how you can help advance them. It also depends on the kinds of productivity obstacles, or “friction,” that you hear about from the people in your workplace.

For example, parking generates many complaints in some workplaces. Today's “smart” IoT-based parking technologies make it possible to use a single mobile app to enter a parking lot or garage with a digital pass, locate a convenient spot and pay.

Another source of friction is the search for a workspace in offices that don't have assigned desks. According to research firm CEB global, a typical employee spends 27 hours per year looking for a workspace. However, it's possible to create a mobile app that enables employees to book a conference room or a

workspace for an hour or a day.

Similarly, an employee could use a mobile app to adjust the temperature or lighting around their workspace — to whatever level enables them to be most productive — or to request a workplace service. Then, you can analyze data generated from the mobile apps to uncover additional ways to improve the workplace experience.

The IoT also can power workplace tools and amenities. Digital signage, wayfinding tools, wireless audio-visual systems and other connected devices can go a long way toward creating a more engaging and empowering experience for employees. Even something as simple as a printer that orders its own toner or ink refills can make an office more productive and less frustrating.

GETTING STARTED

Your IoT journey doesn't have to be comprehensive or high-risk. Instead, take incremental steps toward adopting the right IoT solutions for your organization.

Let your business objectives guide your IoT technology roadmap

What is the business case for IoT in your facilities? It's easy to get hung up on the technology and focus on getting the best systems in place instead of focusing on what makes sense for your environment. Keep your organizational goals up front and center.

Think big, but don't be afraid to start small

Balance short-term goals and strategies with long-term objectives. Think targeted pilots, rapid iterations and test-and-learn cycles to refine ideas and work out the bugs before investing in large-scale deployment. Collaborate with your IT peers about how to best set yourself up for potential IoT expansion opportunities down the line.

Invest in talent and skills

The lack of capabilities and talent with the right training continues to hold back IoT deployment. Not everyone on your team needs to be a coding ninja, but everybody will need to understand at a high level how IoT-based systems work, how to interpret the data, and how to talk to the tech experts so they can address your business needs.

Be smart about security

Don't let security concerns deter you from pursuing IoT solutions altogether. However, your team will need to learn and apply best practices in data governance. FM should work with IT and security experts to protect all building systems – and then trust the professionals and get on with IoT implementation.

Partner closely across your organization

IoT applications cut across many functions – including IT, HR and finance – and implementation requires close collaboration with IT.

Don't underestimate the degree of change management and ongoing investment involved in adopting IoT

For changes with significant impact, you'll need proven change-management approaches to build support, ensure that everybody has the capabilities and tools they need, and demonstrate that top management is on board. You'll also need a strategy for continual improvement. Can you leverage employee feedback and the IoT's data-collection and analysis capabilities to fine-tune your approach?


Start thinking creatively about experience

How can building and workplace technologies help create a more positive, productive, happy work environment for the people in your facilities? FM professionals are in a unique position to help organizations use IoT technology to foster high-touch, dynamic workplaces. FMs also need to start thinking creatively about how to measure and quantify the impact of experience – Experience Level Agreements, anyone?

Tap your IFMA resources

Visit IFMA's new Engage platform and its new IoT portal to learn more about how the IoT can transform your FM practices.

As the IFMA global survey found, adoption of the IoT will create opportunities for you to learn how to exploit new IoT tools and technologies to benefit your end-users. Eighty-five percent of survey participants agree that the IoT will influence the skills required of CRE and FM professionals in the future.

The big picture? The IoT is accelerating the evolution of the FM function and its strategic significance to an organization's core business and brand. The more you can learn about its application in your workplaces, the more ready you will be to lead transformative improvement in your organization. 

RESOURCES

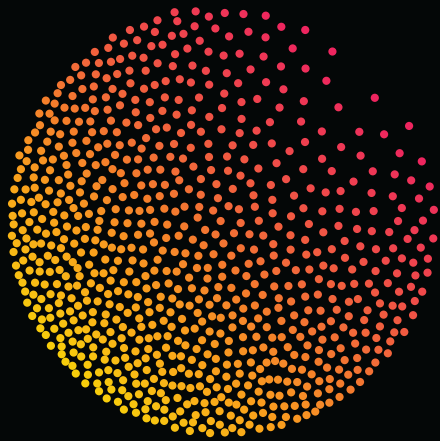
1. **IFMA-JLL white paper**
2. **IFMA Engage** <https://engage.ifma.org>
3. **JLL white paper: Reinventing Facilities Management for the Digital World**
4. **JLL video: The Future of Work is Now**



Maureen Ehrenberg, FRICS, CRE, is President of Global Integrated Facilities Management (IFM) at JLL and is the Immediate Past Chair of IFMA's Global Board of Directors.

BY BRUCE BARCLAY

W O R K I N G A S



ONE

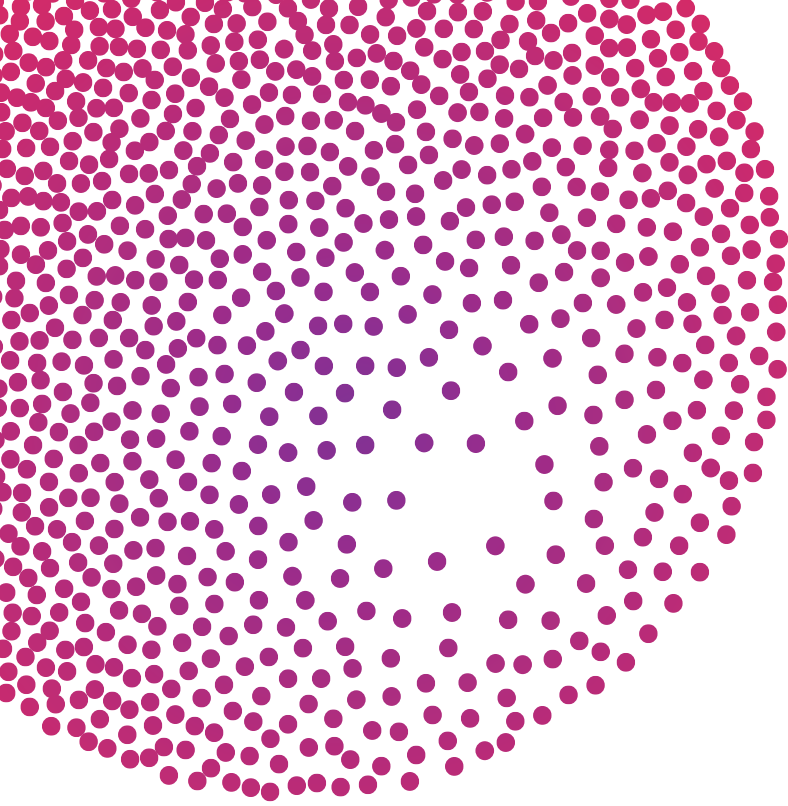
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B U S I N E S S ,

F M A N D

T E C H N O L O G Y A S

" O N E T E A M "



FMJ EXTRA *Video*

A Moment in Time:
An opportunity
for real estate and
facilities to change
the conversation

Change is one of the fundamental laws of nature; it is what drives evolution. Humans are living in an era of unfathomable change. No longer are there great paradigm moments of epic change, but now there are innumerable, micro-changes happening at an exponential rate. Change is surreptitiously, irrevocably altering ecosystems and causing economic, political and social revolution. And nowhere is change on the personal level more evident than in the work environment.

Digital technologies have allowed us to work whenever and wherever we want. Alongside technological change, management structures are changing — getting flatter, more autonomous and leaner — leading to an increase in the outsourcing of skill-specific expertise. There is a departure from traditional organizational structure which blurs how teams are formed and structured. The pursuit, development and retention of talent required to succeed in this environment has become one of the biggest business imperatives.

The culture of an organization — its brand and brand values — are now key criteria in attracting and retaining top talent. Brand, culture and values are increasingly being epitomized in the workplace, including how it's designed, structured and managed, the services that are provided, and the environment that's created as a result. That means businesses are radically rethinking their HR and workplace experience strategies to align more closely with these new, evolving set of business drivers.

OUTPUT FOCUSED

The physical workspace required for the talent of the future must be completely re-thought, re-designed and maybe even relocated. The focus must be on output, or how a workplace engages its people and helps them be at

be at their most productive.

The low level of productivity worldwide is a chronic problem. The Organization for Economic Co-operation and Development (OECD) reported in 2017 that the global economy is still below the four percent average growth rate between 1987 and 2007¹. The Bureau of Labor Statistics reports² that U.S. worker productivity declined by 0.6 percent in the first quarter of 2017.

Productivity is anaemic and getting progressively worse, so the Confederation for British Industry in the UK called for a productivity boost to be the number one priority for business and the government, and the OECD added that only by investing in organizational infrastructure can the productivity puzzle be solved.

While economic imbalances, political unsettlement, geographic distribution and skills shortages are often blamed for low levels of productivity, the physical workplace must also take some blame.

The Stoddart Review³, a not-for-profit initiative formed to raise awareness among business leaders of the importance of the workplace as a key performance lever, revealed that a good workplace can improve business productivity by as much as 3.5 percent. Economist and former BBC Newsnight economics correspondent, Duncan Weldon, cites in the report that this could add almost £70 billion to national output. Small rises in workplace productivity could therefore contribute to boosting global GDP.

A report from Harvard Business Review⁴ argued the most transformational thing a company can do for its workforce is “to invest in creating working environments that unleash intrinsic inspiration.” An inspired employee is more than twice as productive as a satisfied employee⁵ and more than three times as productive as a dissatisfied employee. Yet, only one in eight employees is inspired.

Creating an engaging work environment, the report argues, requires holistically addressing the factors

that drive employee inspiration. This includes more autonomy and agility as well as inspirational leadership.

There’s also the need to focus on practical measures. Statistics from the Leesman Index⁶, the world’s largest independent database on workplace effectiveness, reveal that just 58.2 percent of the 250,000 employees surveyed around the world agree that the design of their workplace enables them to work productively. This means just under half of all workers find their workplace inhibits them from doing their job effectively. Only 51.5 percent say they are proud to bring visitors to their workplace.

Ambient temperature, noise levels, natural light and good air quality are cited as occupiers’ key productivity aids, but those are also most lacking in today’s workplaces. In addition, the lack of a variety of spaces to work, depending on the activity being undertaken, is also an issue.

Research from JLL⁷ demonstrates that engaged employees add 147 percent to business value through higher performance. The research shows that higher levels of employee engagement not only improve the bottom line through increased customer satisfaction and enhanced productivity, but also lower unproductive elements that are a drain on business performance, such as absenteeism or employee turnover.

Currently, perceived productivity is the closest we can come to measure productivity in the work environment⁸. If people believe an environment allows them to be productive, then the chances are they are more productive. But many organisations are going a step further. A team at Nokia developed a mathematical model based on pre- and post-occupancy statistics which revealed not only that workplace design and employee satisfaction impacted perceived productivity levels, but that an increase in perceived productivity correlated to an overall improvement in business output⁹.

Two universities — Harvard TH Chan School of Public Health and

Only **58.2 percent** of the **250,000** global employees surveyed from the Leesman Index agree that the design of their workplace enables them to work productively.

vSUNY Upstate Medical University — are supporting a global study to examine how the indoor environments of 100 office buildings impact employee productivity and health. This builds on previous studies which showed a doubling of cognitive test scores when participants worked in a setting optimised for indoor environmental quality.

This type of activity will only increase in the future workplace. Organizations will want to see a clear return on their investment in the workplace through increased business performance.

NATURE OF WORK

Over the past two decades, the nature of work has changed. This resulted in organizations allowing people to work from home, both to reduce commute and improve work/life balance. The employer benefitted from reduced real estate cost and improved motivation and productivity.

Now, many are promoting a balance between time in and out of the office as there’s a recognition that competitive advantage is largely about innovation, and that usually comes about through face-to-face collaboration. Innovators and creative thinkers need to come together, and that collaboration tends to happen in the office.

Therefore, the workplace of the future will be, for most knowledge workers, a hub where people go to collaborate when needed. As a result, there's a resurgence in the importance of the workplace experience in attracting and retaining talent.

At the same time, this is challenging for real estate and facility professionals. The FM team must have real engagement with the business to understand its utilization dynamics.

CHANGING DYNAMICS

Better work-life balance is often cited as the reason people enjoy working at home, as it is typically the control they have over their own environment which makes them feel more productive. Studies by the University of Exeter's School of Psychology¹⁰ revealed employees who have control over the layout of their workspace are not only happier and healthier — they're also up to 32 percent more productive. The research challenges the conventional approach taken by most companies, where managers often create a "lean" working environment that reflects a standardized corporate identity.

What this means for the workplace is workers should be consulted over changes to their office, and they must have the ability to personalize their working environment. This need not be through personal photos and cuddly toys, as in previous decades, but through the ability to choose the right space for the type of work they are undertaking. Providing a variety of spaces to work also helps to dispel the issues around temperature, noise, light, and air quality as people can choose an environment which suits their needs.

A NEW FM

In response to this business landscape, the contribution of real estate and facility professionals will elevate. There is a growing urgency to evolve the FM position to stay rel-

evant. New skills are required, based on business enablement through vision, values and strategy alignment, to become a more strategic partner to business. To do that with credibility, facility management must reinvent its value proposition and present its case in business-relevant language.

There must be an end to turf wars between business support functions: real estate, FM, HR and IT — and the start of a deep collaboration to support the business, drive change and enable the workplace to transform and deliver tomorrow's business objectives. The Stoddart Review called for the FM, real estate, HR and IT teams to work much more closely together to support the core business and this vision must be achieved.

In addition, FM service providers must think more innovatively not just about the product and service they are delivering to clients, but how they are delivering them. This could involve competitive service partners forging strategic alliances to deliver exceptional service. New partnerships and business models with similar-minded or complementary providers can set the agenda for a new way of working that shares best practice, knowledge and experience in an open and collaborative way.

This "One Team" approach delivers results, as was seen in a recent award-winning program undertaken by Dell EMC. Over a three-year program, a group of internal stakeholders and service providers became a One Team Real Estate and Facilities business family working together in EMEA. Harnessing technology and using the information they already had, but in a different way, produced the edge they were looking for. The benefits were significant and immediate.

An increasingly close relationship between FM and IT will also help to boost workplace productivity. Research from Sungard⁹ reveals that 69 percent of workers feel the right digital tools help them do their job better. There is also a link between recruitment and retention of talent

and IT. Just over a third of employees would leave their organization if offered a job at a more digitally-progressive business and 51 percent believe that career progression is faster at digitally progressive companies.

In the same way that technology is a driver of business change, it can also be the platform for thinking differently. FMs are custodians of essential data and the advent of the Internet of Things will only speed up that transformation. The first few pilot case studies of the impact that a smart, connected building can have on occupier performance are beginning to appear. In the future, the workplace environment will be based very much on strong, reliable statistics demonstrating the most productive and effective conditions.

The evidence is already there. By working together to collect, mine and analyze critical data, real estate and FM will maneuver into position to accelerate change, not just support it.

FM is at a critical moment. An inflection point that offers a unique business opportunity. It is there to be grasped, if we have a confidence to grasp it. **FMJ**



Bruce Barclay is a facilities professional who most recently worked for Dell

Technologies. His international career in business leadership and development includes 20 years at senior management level for organisations in a variety of business sectors from financial services to hospitality. In addition to running his own businesses in property development and telecoms, he is an experienced international speaker and author of the *British Institute of Facilities Management's Good Practice Guide to Managing FM Teams Across Borders*. Bruce has won the *EuroFM Partners Across Borders* award. He is a member of IFMA, CoreNet Global, the British Institute of Facilities Management (BIFM), and past member of the *Building Owners and Managers Association (BOMA)* and *Chartered Institution of Building Services Engineers (CIBSE)*.



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



IFMA[™]

International Facility Management Association

New app simplifies janitorial inspections with the swipe of a finger

Smart Inspect™ is making large-scale custodial programs simpler and more efficient on the campuses of hospitals, hotels, major universities and corporate buildings.

Organizations equipped with Smart Inspect™ can maintain the highest health-and-safety standards, efficiently report and identify areas of deficiency, and increase staff accountability.

Smart Inspect™ was developed by janitorial consulting firm Core Management Services to help organizations fully understand how to maximize their janitorial resources to foster peak performance. It is compatible with most smart phones, tablets and other leading handheld devices, and is entirely Web-based once installed, with all inspection data stored on a secure and stable server.

The inspection process is simple. Smart Inspect™ saves clicks by defaulting all items within an area to “acceptable.” Clients simply need to record “deficient” items and any associated notes or pictures. When the inspection is complete, data is uploaded wirelessly.

Thousands of users have implemented the Smart Inspect™ tool as their janitorial and custodial quality inspection solution, including the University of Florida, Nationwide Insurance, LinkedIn, NASA and Marriott Hotels.

The University of Vermont’s custodial program has been revolutionized by Smart Inspect™. Approximately 170 custodians serve more than 100 buildings on the UVM campus, totaling over 2 million square feet. UVM reports that inspections and reviews only take up two hours of each inspector’s week. UVM credits the application with the university’s excellent quality levels, with an outstanding average score of 92.65 percent, year-to-date.

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pinta acoustic inc. ceiling clouds enhance aesthetics and acoustics

The new combined headquarters for companies PlayCore and Dero in Minneapolis, Minnesota, USA, was designed as an open-plan, “industrial-chic” space with concrete floors and exposed ceilings. To minimize unwanted sound reflecting off the hard surfaces, the office needed acoustic absorbers. Architect Brian Hunke, AIA from Mohagen Hansen, recommended pinta acoustic inc.’s BALANCE and WHISPERWAVE ceiling clouds.

For the combined company office space, two 42-by-96-inch WHISPERWAVE Ceiling Clouds were suspended over the reception desk to absorb sound reverberating off the hard surfaces in the lobby. Eighteen BALANCE Ceiling Clouds were hung over the breakroom to help absorb sound within the space.

WHISPERWAVE ceiling clouds, panels and baffles provide design flexibility and acoustical control across all frequencies. Class 1 fire-rated and lightweight, WHISPERWAVE products are offered in standard and custom wave designs. The products are easy to install and are available in standard and custom dimensions in natural white and grey. WHISPERWAVE acoustical products can also be HPC-coated in standard, premium or custom colors.

BALANCE ceiling clouds provide acoustical control, while maintaining the appearance of an open ceiling. Completely preassembled, BALANCE products are easy to suspend from any ceiling or roof deck, and are ideal for open-office environments and loft spaces. Panels are available in white, black or custom colors. Offered in natural aluminum and white, BALANCE frames are available with non-exposed or exposed 3/8 inch-wide flange around the perimeter.

— VISIT pinta-acoustic.com



pinta acoustic inc. manufactures a broad range of attractive direct-apply, glue-up and suspended ceiling and wall panels, clouds and baffles for residential, commercial and industrial applications.

New CO₂ sensor from Schneider Electric improves indoor air quality and occupant productivity

Schneider Electric announces the availability of a new CO₂ sensor module for its SE8000 Series Room Controllers. The sensor is designed to detect CO₂ levels in environments such as hotels, schools, office buildings and restaurants to help facility managers improve occupant comfort and create opportunities for energy savings.

High CO₂ levels mean high risks within building environments. Occupants in high CO₂ situations can experience lethargy, decreased productivity and fainting. The sensor identifies opportunities to reduce air changes and adjust lighting and temperature settings when rooms are not occupied, which leads to significant energy savings.

“Keeping a close eye on CO₂ levels within buildings is a critical responsibility for today’s facility executives,” said Henry Zebrowski, Senior Offer Manager, EcoBuildings Division, Schneider Electric. “The new embedded CO₂ module optimizes the level of fresh air flow within buildings so facility managers can focus on providing the optimum environment to increase comfort and productivity.”

CO₂ sensors can help building owners achieve LEED, BREEAM and Green Star certifications that promote their dedication to sustainability and attract and maintain tenants. Other benefits include:

- Installation and configuration in minutes
- No external wiring required
- Automatic calibration to ensure extremely high accuracy
- Conforms to ASHRAE specifications for green building standards
- Achieves optimal ventilation and reduces stagnant air
- Adapts to a multitude of environments
- Requires no after-service maintenance
- Low power consumption



Schneider Electric's SE8000 Series Room Controllers integrate a thermostat/temperature sensor and programmable room controller in a single unit, delivering the comfort and control functionality found in multi-component systems, but in a small, easy-to-install package.

— VISIT schneider-electric.com/en/product-range/62240-room-controllers

Haws Integrated® launches ANSI Z358.1 compliant emergency overhead tank shower

Adding to its line of emergency response tempering solutions, Haws Integrated's Model 8740 is a pre-engineered and self-contained overhead tank shower designed for indoor and non-extreme outdoor climate installations. Starting with a standard base model, the 8740 allows for enhanced options to meet customers' needs.

The compact height and modular frame design allows for placement in areas not normally considered for shower installations or in areas where there is no or insufficient water supply. This model is ideal for projects where mobility, fast delivery and low-cost solutions are needed. The unit is ANSI/ISEA Z358.1-2014 and EN 15154 compliant as a stand-alone unit at 60-100°F (16-38°C) ambient temperature.

Enhanced options include AXION® MSR eye/face wash, fiberglass privacy panels, tank temperature gauge, scald and freeze valves, light and alarm, immersion heaters, auto-fill valve, level indicator, proximity switches and chillers.

For more than 110 years, Haws has been committed to inventing, designing and manufacturing hydration and emergency response products. Headquartered in Sparks, Nevada, USA, Haws is globally represented with locations in Switzerland, Singapore, China, India and Brazil.



Made with a chemical-resistant, water-proof coating and protected with UV inhibitors, Model 8740's 423-gallon tank allows for more than the required 15-minute shower, and is fitted with an overflow connection to prevent overflowing.

— VISIT hawesco.com

New features with ResourceXpress meeting-room booking system version 4.8

An estimated 20 percent of meeting rooms that are booked are never used, 2:1 staff-to-desk ratios are now commonplace, and 40 percent of office space is under-utilized. Providing meeting-room booking systems and an innovative desk-booking system that can also be used to manage any flexible workspace more efficiently, ResourceXpress helps maximize productivity and minimize real estate overhead. ResourceXpress 4.8 is the latest version of the meeting-room booking system, offering four new features.

- **Reporting charts.** With improved graphical and analysis reporting, you can filter by date, location, resource type, exclude weekends and choose working hours to create insights into the effectiveness of the workspace. Highlight under- or over-used resources to extract every drop of productivity from the office floor. Four new graphical reports are available from the RX administration console, including Actual vs. Available, Utilization vs. Date, No Shows by Date and Pre-booked Occupancy by date.
- **Future booking using maps.** Book workspaces for future meetings directly from the Maps feature of ResourceXpress on a floor-standing kiosk and using the mobile Web application. This is a major improvement in functionality for kiosk users.
- **Enhanced RFID code manipulation.** Now directly controlled from the ResourceXpress Administration console, it offers the ability to apply a formula against an RFID-swiped code to match it to the right authentication record in the corporate directory.
- **Hybrid-local booking mode.** Designed for clients who want a mix of integrated/non-integrated resources, this enables resource management without integration to booking systems such as MS Exchange, Office 365, Google or IBM (Lotus) Notes. For example, an organization can have meeting rooms set up as resources in Office365/Exchange, while bookable desk resources are created solely within ResourceXpress. Organizations with thousands of desks will appreciate removing the need for defining and managing simple resources like desks in Office365.

All versions of ResourceXpress meeting room booking software are designed to be flexible and to seamlessly integrate with core calendaring and scheduling systems. ResourceXpress communicates in real time, ensuring optimum productivity for all resources. Choose from an extensive range of meeting room screens and/or the innovative Qubi desk booking device.

— VISIT resourceexpress.com

Using electrostatic technology, Clorox® Total 360® System kills cold and flu viruses in hard-to-reach surfaces

Flu viruses are most common during the fall and winter months. In the United States, cold, flu and norovirus season peaks between December and March, and can last as late as May.

Each year, productivity losses linked to absenteeism cost employers an average of US\$225.8 billion. Schools are often among the hardest hit, with nearly 60 million school days lost each year due to cold and flu. Surface disinfection is an important measure in preventing the spread of illness; but it is nearly impossible for building staff to completely disinfect all surfaces manually.

The Clorox® Total 360® System combines patented electrostatic technology with scientifically tested Clorox® disinfecting and sanitizing solutions. The system works by charging and atomizing the sanitizing solution, delivering a powerful flow of charged particles that are attracted to surfaces with a force stronger than gravity. This allows the solution to easily reach and uniformly coat surfaces, including germ hotspots like the sides, underside and backside of surfaces. It covers up to 18,000 square feet per hour, providing superior surface coverage up to four times faster and using up to 65 percent less product compared to conventional trigger sprayers.

In September 2017, Clorox® Total 360® won the ISSA Innovation of the Year Award, and the ISSA/INTERCLEAN Visitors' Choice Award.

— VISIT CloroxTotal360.com

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www.ifma.org/intern-net

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Ask the Experts **086**

Contributed by IFMA's Facility Management Consultants Council

Profiles in FM Success..... **089**

Components in Focus..... **092**

A Second Look at Smart Buildings..... **094**

*Contributed by IFMA's Environmental Stewardship, Utilities and Sustainability
Community Strategic Advisory Group*

Vendor Profiles **098**

FORM MEETS FUNCTION

Ask the Experts

In each issue of FMJ, IFMA's Facility Management Consultants Council shares some commonly asked FM-related questions accompanied by advice from top FM consultants. The questions and answers presented in this section align with IFMA's core competencies following the themes outlined for the given edition of the magazine.

While the following answers are intended to be helpful, these responses should not be deemed complete and are limited in context by the space allocated. Please contact the individual consultants directly for further explanation of the opinions expressed.

CONTRIBUTED BY



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

Q: An innovative, cutting-edge, young and growing manufacturing company is contemplating moving from their existing over-crowded and outdated corporate headquarters. The most important factor in their building selection and space plan is that it must reflect their culture and brand. As an FM consultant what advice would you give this company *before* they enter the search/selection/design phase?

A: First of all, I think re-visiting the concept that the employees have of their culture and brand would be important. Orchestrating a Visioning Workshop could be the vehicle to bring a cross section of key individuals together to review the current elements of the brand as they see it. Within the Visioning Session a good facilitator would bring out any issues as well as solidify a bit the understanding of where they are today. However, the next step and the most important is creating a solid roadmap of moving forward with all of the dreams and aspirations they have for their new headquarters. Here again, the facilitator would be certain to coach them in infusing the thread of the brand and culture elements within the final visioning statement.

ANSWERED BY

Teena Shouse
CFM, IFMA Fellow
FM Transitions

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teena.shouse@fmtransitions.com

A: First, determine your production growth rates at various probabilities over a ten-year time frame. Based on that, establish the plant layout that offers expandability, ensures logistics for materials in/out, and meets current/emerging EHS requirements. The plant's factors must drive all considerations of a future facility, since they will be the most difficult to change.

Second, the HQ are people-related spaces and will likely be on the ground adjacent to the manufacturing area. These can be designed to meet the culture/brand goals, but avoid having that tail wag the production dog ... it's the money-maker.

Finally, as a general rule, be careful not to integrate the two major building functions too closely, but rather design them to be compatible while being adjacent. When the plant prep is done, you're ready to conduct the search process, looking for firms that share that experience.

ANSWERED BY

Dr. Doug Aldrich
CFM, IFMA Fellow

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doug.aldrich@comcast.net

A: You must pin down the new space standards and programming requirements. If you are considering a different ratio from 1:1 due to hoteling and a telework program, that too must also be determined before touring real estate.

ANSWERED BY

Richard Fanelli
AIA, CFM, IFMA Fellow
Principal

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Have a question about the Ask the Experts section?

Contact **Mark Sekula**,
IFMA Fellow, CFM, FMP,
LEED AP, president of
Facility Futures, Inc., at
msekula1@wi.rr.com.

A:

Edgar Schein, recognized as the grandfather of corporate culture said, "Culture matters. It matters because decisions made without awareness of the operative cultural forces may have unanticipated and undesirable consequences."

Before you begin your search for new space you must understand the culture of your company. Why? Because your buildings and the physical workplace, when properly designed with corporate culture in mind, helps to keep the spirit of the culture visible to everyone.

You won't find corporate culture written down. Instead, it's the way things get done in your organization. It's about the company's organizational structure and how decisions are made. It's the embodiment of how employees behave, their attitudes, their actions and habits, their beliefs and the assumptions they make based on those beliefs.

Corporate culture manifests itself in the common, shared values, beliefs and practices. It is developed over time and evolves as the company grows and matures.

For the newly hired FM, clues about what your company's culture is like can be derived from its mission and vision, its web site, how job interviews are conducted and how people dress. Evidence of culture can be suggested in the way people get their work done and how they interact with each other.

Examples of how corporate culture is manifested and supported by the physical workplace abound. For one mid-western U.S. manufacturing company, the family culture was reinforced and supported by providing a large enough dining area so that all 400 employees could share meal times and co-mingle when the plant was closed for lunch.

For a small technology company located in mid-town Manhattan, New York City, collaboration and interaction among employees was paramount to their success. They leased enough space to accommodate a game room and lounge where employees could relax and collaborate. It cost the company tens of thousands of additional dollars per year to lease this additional space but the importance of having it from a cultural standpoint clearly outweighed the cost.

Finally, a large banking institution in the U.S purchased a multi-story building and consolidated five corporate spaces into it. Their existing space was comprised of large cubicles with high walls and private offices along the outside walls. The bank was in the process of changing their culture from a very formal siloed organization to a more collaborative space that inspired innovation and creativity. Their new space consisted of 6' x 6' cubicles with low walls for most employees. Some people who were in private offices moved into 6' x 9' low-walled cubicles. Private offices were built in the central; core of the building so all of the cubicles could benefit from the natural light. All the private offices had glass fronts as well. No one could hide. It was a huge cultural change for the organization and their new space was designed to fully support the cultural change.

So, before you begin the search for your new space, stop, look and listen to what the culture of your company is telling you and let it inform your selection criteria and the design process.

ANSWERED BY

Mark Sekula

*FMP, SFP, LEED-AP, CFM, IFMA Fellow
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FM SUCCESS

University breaks FMP certification records, builds an SFP fan base

This past May, FM certification history was made for a second time at the Washington University School of Medicine in St. Louis. The school became the first to surpass 150 successful recipients of IFMA's Facility Management Professional (FMP®) credential program. Back in 2015, the WUSM department of facilities management set its first historic record in FM professional development. That year, shortly after it launched a strategic partnership with IFMA, it saw 79 WUSM staff members earn the FMP credential in less than three months.

N the March/April 2015 issue of FMJ magazine, Melissa Hopkins, the school's assistant vice chancellor and assistant dean of facilities operations, discussed the success of the institution's partnership with IFMA and their FM credentialing program. Now, Hopkins and Michelle Gubin, WUSM communications coordinator, FMD, are back to provide an update on the program's continued success after three years.

Hopkins and her team established the FMP training program to help WUSM overcome several challenges around using the knowledge, confidence and strategic insight — challenges that have been addressed as more staff members have earned the FMP designation.

Since the program launched, the WUSM facilities management team experienced so much success with FMP training, as well as IFMA Sustainability Facility Professional™ (SFP®) training, that they said it warranted a second look at what they are achieving with credentials. Their goal became to break as many credentialing records as possible.

Since the department's increase in FMP credentials, they report WUSM facility managers have gained the skills and knowledge to break down silos among functional groups, get on track with common terminology, create positive outcomes with proven FM strategies and empower staff to take on leadership roles on project teams and committees. Since the program was implemented, they report cross-functional teams have become increasingly collaborative and knowledgeable about one another's areas of responsibilities, making project times shorter with more effective outcomes.

The positive changes in the department were soon reflected throughout the School of Medicine. Several months after the first wave of FM staff earned their FMPs in 2015, the WUSM facilities management department conducted a customer service survey to gauge effectiveness. The survey results reported that 26 types of work orders out of 35, including electrical services and emergency management tasks, rated better in 2015 than in the previous year. It added up to a perception of more than 74 percent improvement in customer service.

Furthermore, a university survey of the WUSM leadership team on credential training yielded even more positive feedback. About 80 percent of those surveyed indicated that they felt very satisfied with department outcomes since FMP training. An additional August 2015 survey of WUSM FMPs, taken after the first group was trained, indicated that the students felt the training was very beneficial to them in their staff roles.

In addition to the training timeframe being well received, students also indicated that they gained much more beneficial FM knowledge than they had anticipated. Some FMPs commented that the credential training exposed them to all areas of FM, helped them develop a common language among functional groups, and contributed to positive inter-departmental interaction.

Gubin said university leadership, including the vice chancel-

SERVICE EFFICIENCIES GAINED

With increased training and cross-functional efficiencies, WUSM was able to combine three call centers into one. Survey results showed a 74 percent improvement in customer service.

Facilities Integrated Services Center

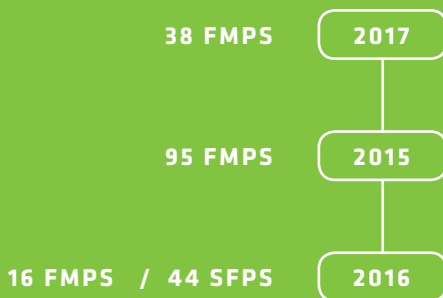
CUSTODIAL SERVICES

FACILITIES ENGINEERING

PARKING AND TRANSPORTATION

WUSM FM CREDENTIALS EARNED EACH YEAR

The FM professional development and certification program at WUSM has led to more than 150 staff members becoming certified.



lor and dean of the school of medicine, have expressed support for WUSM’s FMP and SFP programs. The program has been commended as credential-holding FMs have had a positive impact on project outcomes, positive organizational changes, community well-being, departmental empowerment and the competitive edge that lends to the high profile of the university and the School of Medicine. The facility management team has become a highly-visible and respected department due to WUSM’s IFMA credential training program.

Because of the program’s achievements, WUSM’s credential training program has grown to include trainees from fifteen partner organizations, including the Federal Reserve, Boeing and Pfizer. Recognizing the benefits to both the individual and the organization has allowed WUSM to attract trainees from both the public and private sectors. Additionally, WUSM FM training has recently grown to include IFMA’s Sustainability Facility Professional® (SFP®) credential program.

Sustainability became a larger part of the university’s goals and initiatives with publication of the Washington University in St. Louis 2015-2020 Strategic Plan for Sustainable Operations. This strategic plan outlines the university’s goals for energy conservation, decreased emissions, Leadership in Energy and Environmental Design (LEED) certified buildings, sustainable communities and more. Because SFP training covers many of the same topics, it was an ideal fit to propel the WUSM team of 44 SFP-credentialed FMs to meet sustainability challenges head on.

“Now there are several SFP holders on the university’s sustainability committee, participating in important decision making for the campus in a high-visibility role. In particular, one SFP worked closely with energy engineers to focus sustainable efforts to align with strategies outlined in the Plan for Sustainable Operations,” Grubin says.

She adds the FMPS and SFPs within the WUSM facility management department have become equipped to make important decisions efficiently and with an acute understanding of the future impacts of actions taken in the present. As credentialing has grown, the FM department’s continued success supports the program’s goals, as well as the professional development goals of each person on the team. **FMJ**



In 2014, the department began an extensive reinvestment program, achieving significant operational efficiencies totaling US\$4.8 million, with a five-year cumulative savings of US\$18 million to the School of Medicine. Additional efficiencies of US\$1.9 million achieved also allowed for the department to reinvest in improving campus technology, reinvest in employees through improved wages and annual training programs and enhance campus services levels in the areas of planning, custodial operations, campus safety and public realm.

Components in Focus

IFMA St. Louis Chapter provides holiday funds, clothing for winter



The St. Louis Chapter of the International Facility Management Association (IFMA) provided some warmth to the region's needy this winter. The donations of money, clothing and blankets were made at the organization's holiday social in December.

Representing facility managers and suppliers who maintain the region's commercial buildings, IFMA St. Louis presented a check for \$1,000 to Heat Up St. Louis. The nonprofit organization builds awareness and provides resources to help those in need, especially the elderly and disabled, and needy families with critically ill children, avoid illnesses and deaths during the area's bitter winter season. IFMA St. Louis also funds the organization's Cool Down St. Louis, which provides services and support to keep residents cool during the hot summer months.

IFMA St. Louis has supported the weather-related assistance programs for the past four years. The nonprofit organization helps defray the cost of energy to heat and cool residences, serving more than 300,000 area residents since the programs' inception in 2000.

To further spread the warmth this holiday season, IFMA St. Louis members donated gloves, mittens, scarves, hats, ear muffs and blankets. These items were distributed to various charities that help keep the St. Louis region's most vulnerable warm during the winter.

Backpacks for Students Donated by IFMA Capital Chapter

The Catholic Charities of the Archdiocese of Washington sent a letter of thanks to the Capital Chapter of IFMA for their donation of 72 backpacks and school supplies for Montgomery County residents. The fall donation was made possible by donations made during the chapter's annual meeting and happy hour in August.

IFMA ATLANTA CELEBRATES 35 YEARS AT ANNUAL HOLIDAY GALA & AWARDS BANQUE

The 2017 Annual Holiday Gala & Awards Banquet marked 35 years for the IFMA Atlanta Chapter, held at the Trolley Barn in Inman Park on December 7. The black-and-white event featured dinner, dancing and an address by IFMA President and CEO, Tony Keane. The event also collected new, unwrapped toys for the local Toys for Tots chapter.

The Atlanta Chapter, founded in 1982, is one of the original and oldest IFMA chapters. Only six chapters have an earlier founding date: Houston, Southeastern Michigan, Toronto, Denver, Lehigh and Chicago.





LORRINE BABAUTA

A resident of Santa Clara, Calif., Lorraine Babauta has been working in corporate facilities for nine years. Her first FM position was as a facility manager, and she knew immediately she wanted to continue to grow her career. The excitement and change of each day's challenges have helped her become an expert in her field and industry.

LORRINE: I accomplished a lot of wonderful things in my life while being a mother of four handsome boys and going to be a grandma in October.

— CONNECT ON [LINKEDIN.COM/IN /lorrinebabauta/](https://www.linkedin.com/in/lorrinebabauta/)



MARLON HAREWOOD

As a NYC engineering manager, New York-based Marlon Harewood says FMs have a unique place in the workforce because they serve as the backbone of a company, keeping all essential elements in place. He has been in corporate facility management for seven years.

MARLON: I'm passionate of my Caribbean heritage and culture. My definition of a vacation is traveling to a Caribbean island.

— CONNECT ON [LINKEDIN.COM/IN /marlon-harewood-73293319](https://www.linkedin.com/in/marlon-harewood-73293319)



YASIR MOHAMED

Riyadh-based finance and physical resources manager, Yasir Mohamed, has been involved in diplomatic foreign mission facility management for more than seven years. He chose a career in FM because the industry continues to evolve and is dynamic and fluid. Learning something new every day has provided a challenge that keeps him going.

YASIR: I am an avid hardcore motorcycle biker who is always up for a ride and someone who has traversed on a motorbike the two most treacherous and dangerous roads in the world three times over.

— CONNECT ON [LINKEDIN.COM/IN /yasir-mohamed-25782512/](https://www.linkedin.com/in/yasir-mohamed-25782512/)



GITTE ANDERSEN

Gitte Andersen founded SIGNAL — a global ISS excellence center — 17 years ago. When she started out, she said no one talked about programming rooms focused on human performance. She established a new type of consultancy in construction and real estate that focused on the value of creation and using space as a strategic tool for better organizational performance.

GITTE: When I talk, I often use metaphors and have a dark sense of humour. It's a Danish thing and very hard to translate — I'm still practicing!

— CONNECT ON [LINKEDIN.COM/IN /gitte-andersen-204a552/](https://www.linkedin.com/in/gitte-andersen-204a552/)

www.signal-arki.dk/en

Member Spotlight

A SECOND LOOK AT SMART BUILDINGS

CONTRIBUTED BY IFMA's Environmental Stewardship,
Utilities and Sustainability Community Strategic Advisory
Group members | Erik Jaspers, John McGee and Eric Teicholz

In the March/April 2016 issue of FMJ, authors Teicholz and Jaspers wrote an article entitled “The Quantified Building.” At the time the article was written, there was much confusion within the IFMA community regarding what basic terms meant such as **Smart Buildings**, the **Internet of Things (IoT)**, **Machine Learning**, **Big Data** and **Artificial Intelligence (AI)**. The original article defined these terms and speculated as to the FM implications resulting from the collection, modeling and reporting of sensor and meter data on people, buildings and cities. The growth of the installed base of IoT devices and IoT-enabled features and functionality (e.g., smart sensors, meters, systems, models, algorithms and highly visualized dashboards) in the period since that article was published has resulted in an explosion of new FM products delivering smart building solutions. There are currently IoT-based products impacting almost every component of a building, and its management, including windows, floors, lighting, security and utilities (e.g., water, gas, electricity, steam) – to name a few.¹

According to Juniper Research, the number of installed smart devices is expected to reach

**46
BILLION
UNITS**

by 2021 – a continual increase that has surpassed everyone's previous optimistic expectations.

SMART BUILDING TECHNOLOGY

To prepare the future to achieve this growth, there is no aspect of the current built environment that has not benefited from recent technology advancements. Such advancements include smart materials in building construction, infrastructure upgrades (e.g. from conventional to smart lighting), building automation systems, networks and connectivity, HVAC systems and sub-systems, controls, sensors, end-user devices, advanced modeling, analytics and data visualization.

Looking ahead to 2018 and onward, we see definite trends emerging when we think about Smart Buildings. This article recognizes five of these trends:

- 1 Asset Optimization.** Smart Buildings increasingly use sensors to understand and improve the operational efficiency of building assets. The ability to replace existing proprietary systems with intelligent sensors that send data to the cloud for modeling and analysis will allow FMs to fine tune their buildings to improve customer satisfaction, employee effectiveness, occupant wellbeing and operational optimization.
- 2 Integration and connectivity.** We are seeing accelerating advancements in the integration of building control systems and networks of installed connected devices where data is transferred in real-time through 5G networks.² The promise of 5G networking is a significant rise in available bandwidth, in principle providing a thousand-fold increase.³ The result is that information is communicated in real-time to applications and mobile devices that empower FMs to make the right operational changes in time to best manage costs and provide the best possible environment for customers, users and occupants of their buildings.
- 3 Advanced technology.** supporting sustainability initiatives with much lower payback periods. Vendors of Smart Building products will continue to focus on the increased reduction of utility costs (and particularly energy costs) and greenhouse gas emissions. This will be accomplished by better employment of interval data from intelligent sensors and metering, energy modeling, advanced analytics and high-quality data visualization tools. Data collected by advanced building management systems will be more effectively used to calculate and optimize utility expenses, reduce waste and optimize consumption.
- 4 Research & development to deployment.** Developments in information technology are evolving at increasing speeds. Leading product innovators are commercializing AI powered products and services that support Real Estate and Facility Management initiatives. Some of these technologies are shaped by collaborations between commercial companies and the open source community (e.g. Google with its TensorFlow machine learning library).
- 5 Increased Artificial Intelligence.** The authors have seen a remarkable increase in the use of AI in the business-to-business and business-to-consumer marketplaces. We see examples of AI in applications such as game playing, computer vision/pattern recognition, expert systems and natural language processing. Although AI is still in its infancy with regards to FM. It is only a matter of time before FM applications with embedded AI technology will be more broadly available and used to automate complex FM activities. Among the first applications of AI for FM will involve condition assessment where asset-level analytics will facilitate the generation of more accurate data for predictive maintenance.

BUILDING INFRASTRUCTURES

We can see the impact of the evolution to an inter-connected world of the environment, buildings and people. What is emerging is not merely a global “network” but a transformation to an infrastructure of multiple platforms, applications and devices that connect and interact with each other. Applications and assets that relate to real estate and facility management will increasingly depend on such connectivity, automated control and decision-support to carry out their roles and move them from being managers to being conductors or pilots of the built environment.

This requires ubiquitous connectivity within and between buildings. This, in turn, implies that technology needs to mature so that data, control decisions and advice flow seamlessly to the point of execution with no connectivity “dead spots.” There are still challenges to overcome and new breakthroughs in connectivity to be yet achieved (e.g. fully connecting and empowering building field services to complete work that cannot be automatically executed).

It does not help when diagnostics and decision support are no longer available to field personnel because their mobile devices cannot access central knowledge libraries or the results of diagnostic modeling. Consequently, solutions that address losses in connectivity need to be built into workflows that address the maintenance and operation of the connected world, which includes the environment, buildings and people.

Field services sometimes require that mobile applications work offline (e.g., if there is no connectivity in certain spaces). Providing services in this environment (without the web) might reduce the benefits of the application used. Operating offline implies that important documents (instruction manuals, BIM models, safety and security guidelines, etc.) need to be previously downloaded to mobile devices. This does not only incur the risk of error (think of document version management and completeness of documents) but also could increase the risk of data loss or theft if devices get lost. The data management around providing documents on devices also implies additional cost in terms of setup time as well as data management. The consequence of this is that smart and intelligent Buildings require pervasive network connectivity.

ARTIFICIAL INTELLIGENCE FROM SMART TO INTELLIGENT

With the emergence of AI in the field of software applications, the question arises as to how to define the use of AI? The use of the word ‘smart’ has already been applied to label things that are connected and communicate with each other, but how should we differentiate smart with AI-based applications and things? The IT industry seems to adopt the label ‘intelligent’ to indicate the use of AI. At present, there are many interpretations and definitions as to what intelligent means.

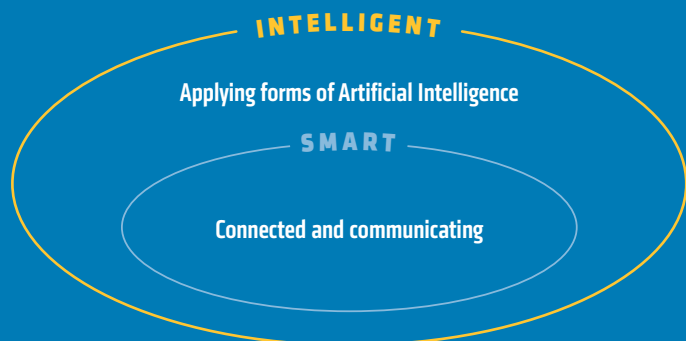
The availability of large amounts of data is a prerequisite for the application of AI. The authors take the position that ‘intelligent’ devices are implicitly ‘smart’ in that intelligence incorporates the accepted definition and functionality of smart (for example, communication networks, sensors, devices) that can be accessed and controlled, as appropriate, locally and remotely.

The qualification of “smart” for things that merely communicate was introduced almost ten years ago at a time when we were probably not anticipating the emergence of distributed intelligence in computing. As such this can be seen as a proof of the astonishing speed that innovations can occur.

The distinction between “smart” and “intelligent,” however, is even more significant. A “smart” camera, for example, will merely be able to relay its images to other devices or applications whereas an “intelligent” camera will use the camera data to analyze images as well as describe what can be seen.

The implication of this would be that, in the future, we can and should develop clear definitions so that communicating on these topics is clear. The confusion between “smart” and “intelligent” buildings is an example of the need for a well-defined taxonomy of important terms.

FIGURE 1 Relationship between “Smart” and “Intelligent”



NOT SO FAST: SECURITY, BOTNETS AND CYBER ATTACKS

The thousands of connected devices in Smart Buildings create ever increasing cybersecurity risks. An IoT survey initiated by IFMA indicated that security was the primary impediment to IoT implementation. IFMA stakeholders do not have confidence that their connected assets are cyber secured and therefore the improved availability of needed information is more than offset by the negative impact on the overall business from a hacking intrusion through the connected building systems (for example, the hacking of Target stores' U.S. cash registers in December 2013).

The nature of these type of threats are complex. For example, Botnets (robot networks) are computers infected with externally-controlled software and are relevant to FM. Such networks are primarily used for distributed denial-of-service (DDoS) attacks. This has already occurred, for example, with chillers being shut down and the result of a building having to be evacuated. However, Botnets are capable of much more serious actions (e.g., destruction of assets). Unless we learn to mitigate such elements of risk, the potential for data theft, as well as service and asset disruption, remain high and will dramatically slow the adoption of the enabling solutions, and therefore benefits associated with, smart buildings.

Building owners need to treat asset security as both an IT problem to be solved and the control of business risk exposures which need to be managed in a way that allows Smart Building driven financial returns to occur.

UNDERSTANDING AND SELLING BENEFITS TO THE CFO

As buildings increasingly collect and consolidate data from devices, as analytics and data mining tools become more sophisticated, as AI and machine learning matures, FMs will have access to a vast amount of knowledge and actionable recommendations about how their building operates and how employees use them.


In fact, FMs will be able to focus primarily on handling exceptions since most standard operations will be automated. This will free up time for real estate and facility managers to address topics around providing more value to their organizations instead of spending time on operational fire-fighting.

Smart Buildings will optimize or support critical parts of a business, including employee satisfaction, space and asset utilization, utilities consumption, building security and safety. Much of the future is available to FMs today. Sensors can, for example, monitor assets and then, when needed, trigger maintenance recovery procedures even before an alert has been received. Smart lighting and HVAC systems can sense when spaces are occupied and adjust lighting and air flow/temperature levels based on space utilization.

This same data can also be used to optimize space from planning and utilization to ensuring a clean, comfortable environment. All of these benefits will be quantifiable and directly impact an organization's bottom line. By extension, facility managers will have the responsibility to communicate these benefits to management in order to get the financial and administrative support needed to effectively implement the technology solutions required.

CONCLUSION

As illustrated by Maureen Ehrenberg, past IFMA Board of Directors chair, at World Workplace in 2016, IFMA recognizes the technology tsunami underway. FM is increasingly becoming a technology and IT-based business. As buildings are digitized, connected and "learn" to adopt their behavior to changing circumstances (like weather and occupancy patterns), it is important that real estate and facility management leaders acquire a deeper understanding of technology and obtain the ability to deploy constantly evolving technologies.

The world of connectivity between environment, people and buildings will indeed occur and the reality of sophisticated hackers will not go away. Consequently, when implementing IoT initiatives and other digital building technologies, the emphasis on security and digital resilience will need to be balanced with the gains expected from its adoption. To gain the most advantage, FM and IT will need to join forces and can no longer operate as separate silos. 

REFERENCES

1. For information about specific new IoT products, see "50 Emerging Players in the New Buildings Ecosystem," BuiltWorlds, Sept., 13
2. The next generation of mobile networks or wireless systems. The standard is still quite fluid and will probably not be commercially available for two years.
3. See the following for a good and simple explanation on 5G: <https://spectrum.ieee.org/video/telecom/wireless/everything-you-need-to-know-about-5g>

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