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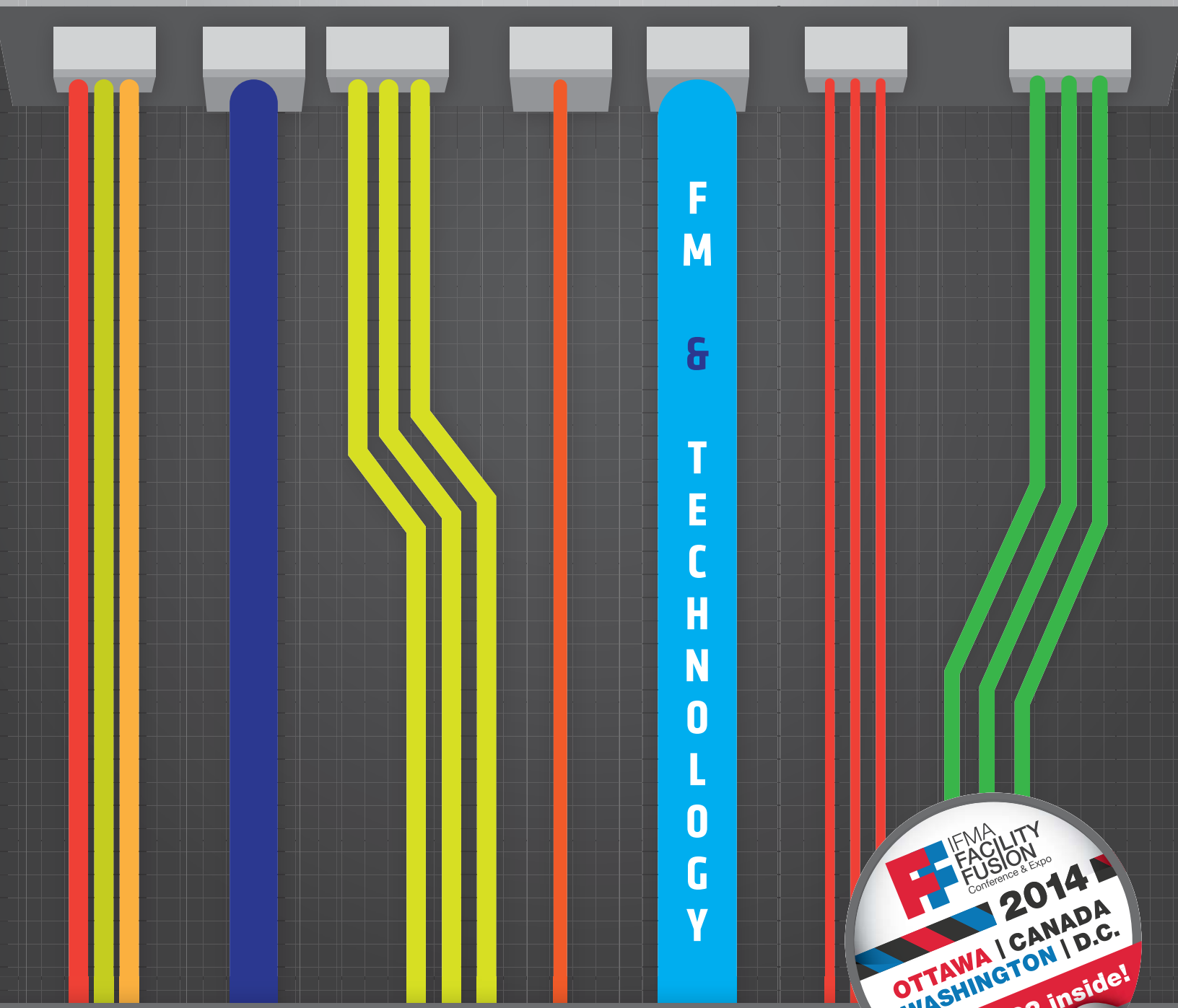




INSIDE

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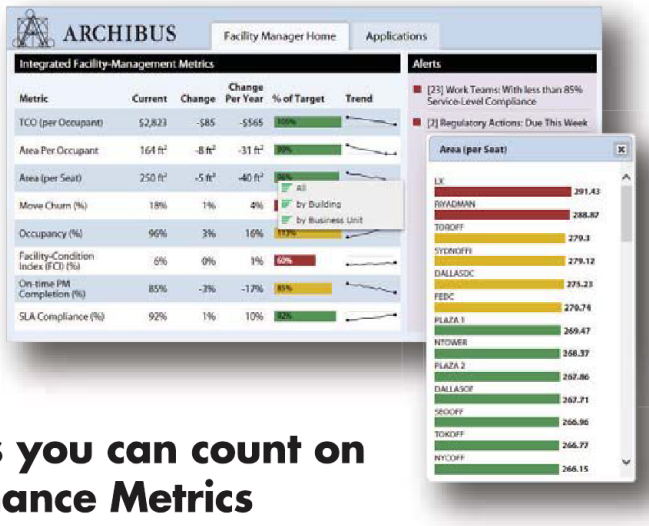


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**BEHIND THE COVER:** *Technology is constantly evolving in the FM industry — are you plugged in to the latest and greatest digital trends? In this era of technological development, FMJ is your source (and your server) for keeping up on what's important in the digital realm. With this issue's cover, it's all about staying connected with us at IFMA.*



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Empowering Facility Professionals Worldwide

### ABOUT IFMA

IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting more than 23,500 members in 94 countries. The association's members, represented in 130 chapters and 17 councils worldwide, manage more than 37 billion square feet of property and annually purchase more than US$100 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 facility management conference and exposition. To join and follow IFMA's social media outlets online, visit the association's LinkedIn, Facebook, YouTube and Twitter pages. For more information, visit the IFMA press room or www.ifma.org.

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*Check out the interactive version of FMJ, featuring* ***videos, online extras and more!*** *FMJ can also be viewed on mobile devices.*

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*The online version of the publication includes interactive resources.*

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## FMJ EXTENDED

*This exclusive online section focuses on expanded FM coverage.*



## SOCIAL MEDIA

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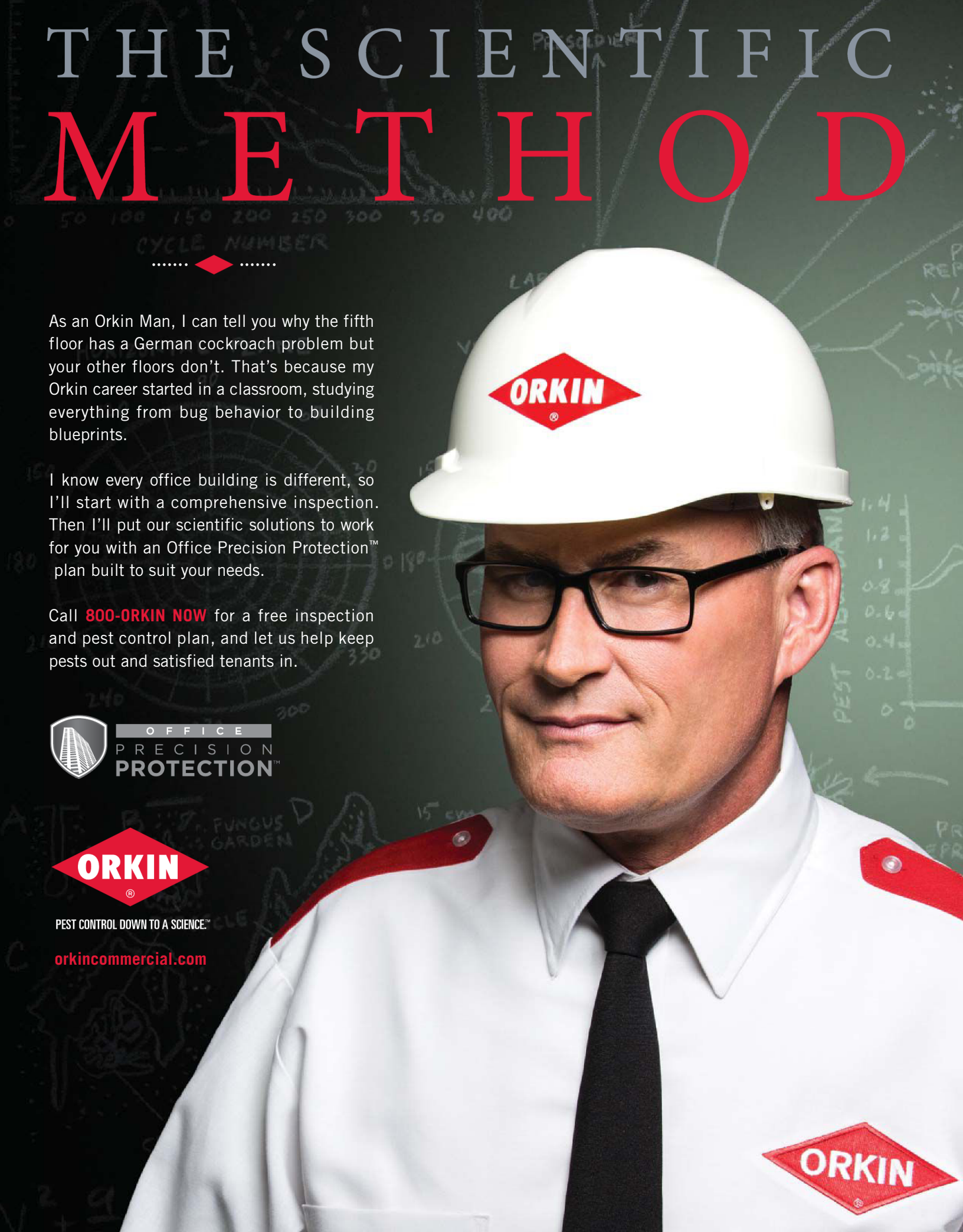
# THE SCIENTIFIC METHOD

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# EDITOR'S COLUMN

**ANDREA SANCHEZ**
Editor-in-Chief
Facility Management Journal

Technological advances have made the impossible, possible.

Ten years ago I would never have imagined being able to successfully work remotely for a Houston-based organization from halfway around the world. The thought would not have crossed my mind, and frankly, most employers would have rejected the idea.

Fast forward to 2014. I start my day communicating with a member from India who shares my same time zone. I am then able to catch up on Houston staff email that took place while I was sleeping, edit the final proof of the upcoming issue of FMJ, present a PowerPoint to IFMA staff through a video meeting and lead a knowledge strategy conference call with IFMA members from different continents.

It is amazing how many online resources, tools, apps and software packages exist to allow someone to work virtually any time and from anywhere. The best compliment I've received from a member is them thinking I still work in Houston. The fact that they did not realize I now live overseas proves that technology is breaking barriers, allowing us to build seamless connections and do business with people we would have never reached before.

## FM and technology

It is no surprise that technology continues to make quite a splash within facility management. From building information modeling (page 40) to self-service systems (page 58), we live in an era which allows us to increase efficiencies, innovations and quality of analytics.

As with any new technological implementation, buy in and basic training are essential to successful onboarding and change management. The issue's feature article "Buy In Before Buying" on page 18 explains that in order to succeed, any software solution needs to be accepted by the employees who will be using it. Managers who are best at maximizing buy in will be the ones who enjoy the highest return on investment.

## Speaking of ROI...

If you haven't heard already, IFMA will host two Facility Fusion conferences this year (March 18-19 in Ottawa, Canada and April 15-17 in Washington, D.C., USA). Compared with other events, these spring conferences provide optimal networking opportunities and top-of-the-line leadership training — refer to page 32 for more information. In conjunction with the April Facility Fusion, IFMA will host a special one-day BIM Conference on April 14 (see page 34).

Lastly, I would like to highlight the growing areas of the magazine. Besides the FMJ Extended section, which provides additional online articles, we have debuted "Behind the Brand" — giving a more intimate perspective on some of our highest level Corporate Sustaining Partners who are dedicated to helping magnify the FM profession (refer to page 36).

I look forward to visiting America in April for the Fusion event. It's always a pleasure meeting and reconnecting with each of you. Until then, let's start some conversations on Twitter. Follow IFMA at @IFMA, @TheFMJ or myself at @asanchez16.

Until next issue,

Andrea


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# CHAIR'S COLUMN

**JON SELLER**
Chair, Board of Directors

As I write this column there are a number of areas in the northern hemisphere that are experiencing extreme or unexpected snow falls. The polar vortex has sent a calling card and disrupted normal business activities across the globe. Recently I was in New York on a day of really heavy snow and it reminded me of the tireless work that is done to move the snow, make the roads and paths safe, and allow business to continue. Next time it snows, take a minute to thank the people who quietly work to restore some normalcy to our commutes.

## Succession planning for IFMA

Any organization the size of IFMA needs to have strong governance, and to place strong emphasis on succession planning. If you are a regular reader of FMJ you will notice that each year the chair's column is written by a different individual. IFMA's succession planning and leadership development is based on a one-year cycle, with our elected officers spending time on the board of directors, one year as second vice chair, another year as the first vice chair and finally one year as chair. In itself this provides IFMA with well-rounded oversight and allows for seamless leadership, particularly should there be any unexpected events.

One of the challenges as the chair is to ensure that new initiatives are commenced during the one-year term. In reality most initiatives do not reach completion in the year that they are commenced due to scale, size, logistics, testing, etc. This year's officers (First Vice Chair Jim Whittaker, Second Vice Chair Michael Feldman and me) have jointly agreed on a number of initiatives that are expected to be completed during one of our consecutive terms. While not entirely new, this early alignment should accelerate the pace of the process.

We are planning to announce some exciting new initiatives at the Facility Fusion conference in Washington, D.C., USA in April. The initiatives relate to sustainability, global outreach and more. I hope to see you in D.C., but we will be sending updates to those who cannot attend.

The new IFMA logo is being rolled out, and a number of chapters have already integrated this into their websites and collateral (to see some examples, turn to page 48). The feedback from members is good — what do you think?

## Succession planning for FM

At a recent conference in China a senior government official presented on the current leadership's vision for the future. The message was that China sees itself as moving from a manufacturing economy to a service economy. What does this mean for the rest of the planet? In my way of thinking this is a catalyst to the growth of facility management in China and echoes what we have seen in other developed economies: smarter use of the built environment by adding science to managing facilities. There has never been a better time to become a facility manager.

On that topic I would like to take a moment to recognize the invaluable work done by the IFMA Foundation. Under the dynamic leadership of Chair Jennifer Corbett-Shramo and Executive Director Jeff Tafel the outreach continues to grow through accredited FM degree programs, scholarships and education. Last year approximately 800 students passed through university/college facility management degrees, and at graduation 100 percent of these graduates were placed in jobs. Can there be any other industry that has this level of job placement? More universities have applied to become IFMA accredited and will shortly be helping to develop future facility managers. Stay tuned for more updates.

I have really enjoyed the opportunities that I have had to meet with a number of our chapters in this past year. Each chapter has unique and inventive ideas about member engagement, growth and the promotion of FM. The amount of effort and energy that the chapter and council leaders contribute to our organization is exceptional and every touch point helps to promote the profession of facility management. Thank you for all the exceptional things that you do for IFMA.

Take care,

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# **PRESIDENT'S** COLUMN

**TONY KEANE, CAE**
President and Chief Executive Officer

What a wonderful world we live in! Most days I am in awe of how much technology touches our lives moment to moment. Other days when technology does not work the way I want it to I am in a state of total frustration. Either way we are truly living in an age of technological innovation.

Facility management is impacted by this tech revolution just like any discipline. The recent FM Trends Report (released in February 2014) predicts that many candidates for FM positions in the future will be from information technology backgrounds. At a minimum the next generation of FM professionals will have to understand the impact of technological systems to a much higher level than today's expectation.

A few questions we need to ask ourselves:

1. What am I doing to prepare myself to meet the challenges created by an ever-changing technological environment?
2. What am I doing to help prepare my successor for the future challenges of FM?
3. What am I doing to support the next generation of FM professionals?

Only you can answer these questions; however my hope is that your responses include at least some of the following items:

1. You spend time, on a regular basis, familiarizing yourself with new technologies and products. You may take classes that provide an overview of how technology can improve efficiency or strategically align with your organization's goals.

   My favorite answer would be that you are planning to attend one (or several) of IFMA's World Workplace or Facility Fusion events to see the latest product innovations.

2. Before you can prepare your successor you have to identify who on your team you want to be considered as your successor. If you can't answer that question then that is your first task.

   Once you identify your successor, look at this person's professional development plan to make sure he or she has the tools necessary for the job. Identify opportunities that can make this person shine within your organization's leadership, especially in front of your manager. Help him or her gain a better understanding of what is required in your position through shared involvement in current and ongoing projects.

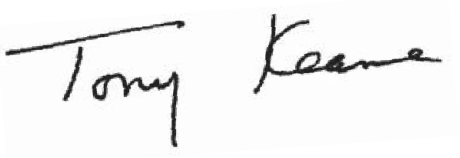
3. Facility management as an integrated discipline is still a young profession. Fifty years from now you will be considered one of the early adopters of FM. By participating in your local chapter or council you have opportunities to reach out to students and young professionals who need mentoring.

   Be seen as a leader by the next generation of FM professionals. Contribute to the IFMA Foundation to assist its efforts in workforce development and scholarships. Give back to your profession and industry with your resources. Consider becoming a more active volunteer. Exemplify the best practices within FM and share your experiences with young professionals.

Working together through IFMA we can help evolve FM into an absolute must have for any organization. Make your mark on FM's next generation and prepare for an ever-changing environment that will see new breakthroughs as a result of advances in technology.

I would like to say thank you to the Greater Triangle Chapter for hosting Second Vice Chair Michael Feldman and I recently. They have a wonderful chapter and are utilizing technology to make chapter administration and communication much easier. I also would like to thank IFMA's longtime partner Japan Facility Management Association for hosting the FM Asia Congress in Tokyo, Japan in mid-February. Chair Jon Seller and myself appreciated being able to participate and represent IFMA at the event.

Please invite a colleague to join IFMA and share the IFMA experience!



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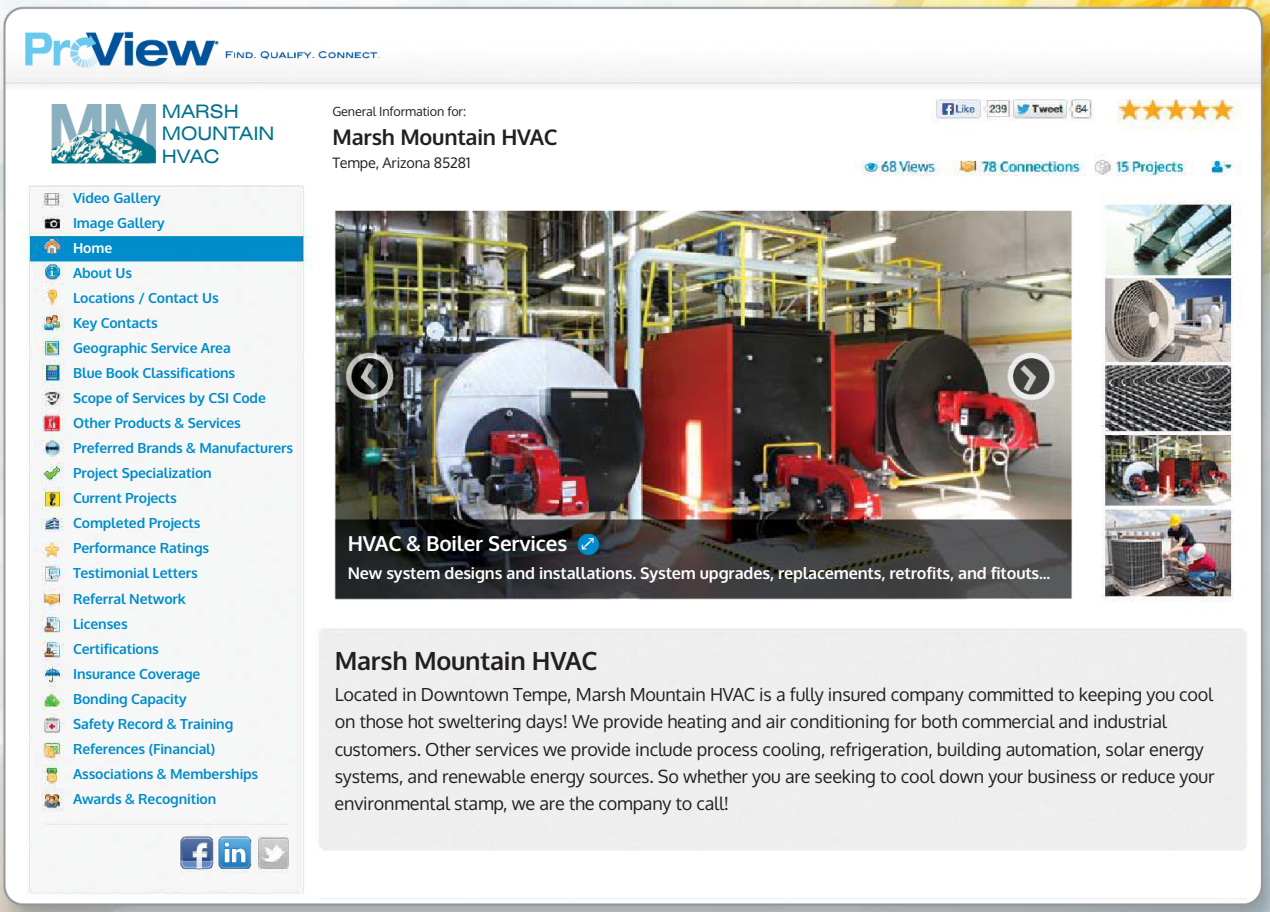


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## Sodexo 2014 Workplace Trends Report reveals business-critical forecasts

With 54 percent of our waking hours spent at work, the employee of the future will expect to spend more time enjoying a series of memorable events and interactions that are company-initiated, according to the 2014 Workplace Trends Report, released in January 2014 by Sodexo. Now in its third year, the report examines key trends and solutions linked to higher employee retention, engagement and increased productivity in more efficient, intelligent buildings. It is critical business intelligence, considering that of the approximately 100 million people in America who are employed full-time, only 30 percent of them are engaged and inspired at work.

Sodexo's 2014 Workplace Trends Report identifies 10 significant trends:

1. Workplace experience design
2. Creating an engaging work environment through gamification
3. Health-centered buildings: A paradigm shift in buildings and operation
4. Cross-cultural understanding and management
5. Always on: Managing the challenges of work-related communication technology
6. Demonstrating value in employee recognition programs: Why VOI is the new ROI
7. Constructing "smarter" buildings
8. Creating the future of work: Getting started
9. 30 jobs of the future and how to create them
10. Total health: Integrated approaches to worker health promotion and protection

The Sodexo report finds that today's workforce is looking for more meaningful, relevant work; flexibility, training, civility among peers; and rewards and recognition germane to personal values. Employees want an "experience" — one that creates an attachment to their organization. The report provides insights on how companies can create that experience, and why not doing so will have significant bottom-line implications for every business.

The report examines how successful businesses will need to: design employee-centric office buildings and workspaces, tie workplace environments to the employee's "experience;" develop a workforce with a global perspective; incorporate games into employee training; develop processes that don't overwhelm employees in an "always-on" environment; and adopt an approach to employee well-being and health that is truly holistic.

The work world is rapidly changing, with a variety of trends coming into play — trends that did not even exist 10 years ago. Sodexo's report also includes an article authored by the World Future Society called "30 Jobs for 2030." Many of the emerging careers it addresses (e.g. chief experience officer, energy harvester, office concierge, green career coach, etc.) are based upon what will likely be core organizational needs by 2030, and the sooner organizations plan for these contingencies, the better.

Sodexo's 2014 Workplace Trends Report combines insight from principal research, clients, academia and leading facilities management and human resource trade organizations. The company's researchers used mixed-method research to monitor and collectively examine trends that affect the quality of life of consumers in the workplace. This approach included traditional quantitative measures such as end user satisfaction and preference surveys, psychographic analysis at client sites, social media monitoring and a literary review consisting of consultant reports, academic and trade journals, and information from industry associations.

The full 2014 Workplace Trends Report and video, including the entire list of "30 Jobs for 2030," are available at www.multivu.com/players/English/62478-sodexo-workplace-trends-2014.

## DTZ appoints Paul Bedborough as president of facilities management for the Americas

DTZ, a leading global property services firm, has announced the appointment of Paul Bedborough as president of facilities management, Americas, effective immediately. In his new role, Bedborough will lead DTZ's high-potential facilities management operations, a nearly US$1 billion business in the Americas. He will be based in both Boston, Mass. and Chicago, Ill., USA.

With 14 years' executive experience in the global facilities management and real estate services industry, Bedborough joins DTZ from his former position as vice president of global operations americas at Global WorkPlace Solutions, where he was responsible for driving operational excellence, improved customer satisfaction and increased profitability across 12 countries and 7,000 locations.

Bedborough takes over from George Keches, who stayed on at DTZ for several months to ensure a smooth transition to the new leadership.

Bedborough's experience includes developing and implementing global FM programs in the areas of safety, critical environments, continuous improvement and workflow. Earlier in his career, he served as vice president and general manager of Global WorkPlace Solutions' USA facility management business. Based in the U.S. since 2003, Bedborough also served as director of operations for the company in the U.K. He earned his MBA at the University of Leicester, U.K., and is a member of CoreNet and IFMA.

## Hope for Vietnam real estate market in 2014

Last year ended with some positive signs for the outlook of the Vietnamese real estate market. Lower interest rates gave further potential for mortgage lending to increase as well as providing impetus for investors to adjust asset allocation away from deposit accounts into other investment channels. With the local gold price decreasing 25 percent year-over-year, local investors have started to turn their back on buying gold in favor of other assets such as property.

Looking forward to 2014, we can see a range of themes in different areas of the Vietnamese market:

- **The office market:** Because of limited new supply to be completed in HCMC in 2014, there is little reason to expect any softening in rents and reason to believe some landlords positions may strengthen. Conversely in Hanoi, landlords are still suffering from a large amount of new supply, which will put downward pressure on rents in the market, especially for Grade B office space.
- **The retail market:** In 2015 Vietnam will have to accede to its World Trade Organization obligation to permit the opening of wholly foreign-owned restaurant businesses, which will generate demand for retail space from foreign food and beverage retailers entering the Vietnamese market. Food and beverage/supermarkets is a non-cyclical sector which provides necessities and is expected to remain active. More affordable supermarkets also continue to expand to second- and third-tier districts with high population density and low to medium income.

Foreign retailers and foreign developers are confident over the long-term growth of Vietnam, especially in its 90 million, predominantly young population. A warming of government policy, especially the Economics Needs Test, will welcome retailers and instill confidence in investors to tap into the under-served retail market in Vietnam. Vietnamese developers and retailers will retain the competitive edge on account of their understanding of the local market, the speed with which they can get their product on the market and their access to the best real estate. However, as the market develops and becomes more competitive, quality of design, tenant mix, marketing and management will play a much greater role.

## IFMA, CBRE release white paper: Facility Management Trend Report

IFMA, in conjunction with CBRE Group, Inc. has produced a white paper identifying key trends and opportunities within the facility management industry. The full report, titled Facility Management Trend Report: Emerging Opportunities for Industry Leaders, gives a data-supplemented account of a two-day workshop held at IFMA's 2013 World Workplace Conference and Expo, Oct. 2-4, 2013 in Philadelphia, Pa., USA. The workshop included more than 20 facility management practitioners, real estate leaders, service partners, academics, consultants and members of IFMA who explored facility management trends in leadership, sustainability and technology.

"As facility management professionals come together to create and define their discipline, a clear, unified picture of the industry is emerging," said IFMA president and CEO Tony Keane. "Recently, FM has grown in prominence as the opportunity to identify shared solutions to shared problems has elevated the profession. Organizations like IFMA and CBRE support the network that is crafting the developing standardization. This timely white paper provides invaluable insight into FM opportunities that will shape the industry for decades to come."

FM professionals utilize multiple disciplines to ensure functionality of the built environment by integrating people, place and process. Around the world, the industry continues to advance to new levels of importance as the built environment grows more sophisticated.

The white paper offers insight into trends and opportunities across three subject matters:

- **Leading the Conversation –** Expanding the scope of subjects with which FM is involved. Showcasing FM relevancy and impact in areas such as business continuity, corporate social responsibility initiatives and employee wellbeing.
- **Speaking the Right Language –** Relaying FM opportunities and challenges in ways that resonate with the C-suite.
- **Building the Future of FM –** Directing the advancement of people, processes and systems to advance the profession in the long term. Identifying talent, building integrated systems that connect data from disparate resources and cultivating agility to meet continuously changing business and culture.

The full report can be purchased at the IFMA Store (online at http://www.ifma.org/marketplace/store; US$120 for IFMA members/US$180 for non-members). The executive summary is available via the IFMA Knowledge Base (online at http://www.ifma.org/know-base/fm-knowledge-base; free for IFMA members/US$0.99 for non-members).

## IFMA offers enhanced Benchmarks Exchange platform

IFMA has introduced an enhanced Benchmarks Exchange (BEX) platform with quicker, more convenient data entry, access and export for the benchmarking and reporting needs of facility management professionals around the world. IFMA's online benchmarking portal allows facility professionals to compare building data filtered by industry, facility type and geographic region.

Benchmarking is a process of comparing the performance and processes of a specific facility and facility management team to those of a similar or related industry. It is one of the valuable tools facility management professionals have at their disposal to identify industry best practices and measure relative performance. As the largest professional association for facility managers in the world, IFMA's benchmark software, BEX, offers a unique and powerful tool to the FM industry.

In February, IFMA's BEX was enhanced to empower FM professionals to achieve the benefits of benchmarking as efficiently and conveniently as possible. Updates to the overall look and feel of BEX offer a more streamlined and expedient way to enter, access and report data in the areas of annual facility costs, O&M practices, space and staffing.

BEX
IFMA'S BENCHMARKS EXCHANGE

New and improved features include:

- Users have the ability to create a portfolio so they only need to enter their facility description once.
- Users may complete data entry at a time that is convenient for them.
- Users can save their facility data to compare with a range of facilities.
- Users can easily save and export queries to aid in regular reporting efforts.
- Users are empowered to conduct benchmarking annually.

There is no charge for use of the enhanced data-entry interface and those who complete all required data will have complimentary extended access to the reporting function as well. The reporting function is also available by subscription, with a discount offered for IFMA members.

## Survey shows that most Americans are in the dark about lighting options in 2014

Under a little-known requirement that went into effect in January, the last of the "general service" incandescent bulbs — descendants of the original light bulb invented by Thomas Alva Edison in 1879 — can no longer be manufactured or imported into the U.S.

This requirement marks the final stage of the Bush-era Energy Independence and Security Act legislation (EISA) of 2007, spelling the end of the 40- and 60-watt standard incandescent bulb. The 100- and 75-watt bulbs were phased out previously in 2012 and 2013.

To explore some of the ramifications of the phase out — outlined in a recent survey — a panel of experts gathered in New York City just before the law went into effect. Their purpose was to discuss the dimensions of the problem as well as options available.

According to the survey, which was conducted for Lutron Electronics, the company that organized the New York panel, very few Americans are even aware of the phase out. The Lutron survey, which polled 1,000 adults in the U.S. in November 2013, revealed that fewer than one in three understood that the familiar 40- and 60-watt bulbs were soon to disappear.

The Lutron survey, conducted by The Futures Company, an independent research organization, also found that only one in 10 adults is familiar with other options, including light-emitting diode (LED) lamps and compact fluorescent lamps (CFLs). This corroborates a recent report by the National Electrical Manufacturers Association to the effect that CFL market penetration remains flat and LEDs are being used in only about one percent of all U.S. sockets.

While most people seem to be in the dark about their options, three-quarters of those surveyed said it's important that the new energy-efficient bulbs be dimmable.

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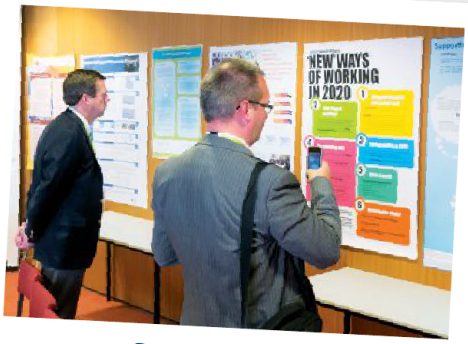


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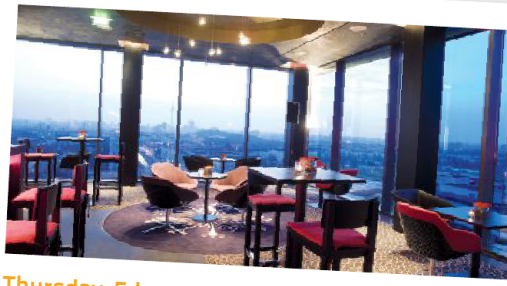

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How Stakeholder Buy-in Leads to Project Success

# BUY IN BEFORE BUYING

## *STAKEHOLDER SUPPORT KEY TO* SUCCESSFUL SOFTWARE IMPLEMENTATION

BY CHRIS MUMFORD

Explosive growth in mobile, SaaS/cloud and other smart computing innovations helped make 2013 a banner year for enterprise software solutions — a category that includes facility management applications like computerized maintenance management software (CMMS) and building information modeling (BIM) systems. According to Gartner, a technology research firm, businesses worldwide spent nearly US$300 billion on these products last year — a 6.4 percent increase over the previous year — and growth is expected to accelerate further through 2014. In the U.S., overall investment in software has risen 19 percent since its previous peak in 2007.

A number of factors have contributed to this surge in popularity. Mobile and SaaS/cloud platforms provide broad, flexible access to these solutions, which has cut down on hardware costs and made it easier to add users and sites. User interfaces are becoming more streamlined and customizable. Feature sets are growing more powerful, and encompassing larger, more complex workflows, processes and operations.

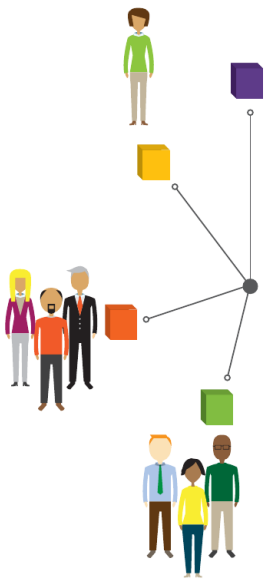
Each of these factors carries different benefits for different people, but for the typical executive or manager, they all spell one thing: ROI. The case for investing in enterprise software solutions is, in other words, getting stronger and stronger, and the amount of money being spent on them suggests that facilities executives and managers are buying in.

But this can actually present a problem: In many cases, the process of investigating the value and need

ONE OF THE MOST COMMON MISTAKES MANAGERS MAKE IN THE IMPLEMENTATION OF NEW SOFTWARE IS ASSUMING THAT END USERS DON'T NEED TO KNOW WHY THEY'RE USING IT.

for such solutions begins with the executive/management team and ends with the final purchase. The end users who will be chiefly responsible for the success of the software are often only involved late in the process, if at all.

Denied the opportunity to voice their opinions early on, these key stakeholders often balk when they're asked to substitute familiar processes for new software-based ones, even if doing so will make their jobs easier.



This helps explain why, according to surveys, rates of satisfaction vary widely for these solutions. Companies are spending on the promise of high ROI, but failing to secure the staff-wide buy in necessary to achieve it.

The best way to reverse this trend is to extend the product selection process to the rest of the organization in order to convey value, minimize apprehensions and invite feedback. This process consists of three key components: communicating value and involving key stakeholders early, investing in proper training and using organizational means of securing buy in.

## Communicate value and involve key stakeholders early

One of the most common mistakes managers make in the implementation of new software is assuming that end users don't need to know why they're using it; they only need to know how. No sales representative would expect to generate enthusiasm for a product without first explaining why it represents a beneficial solution, yet management teams make this mistake all the time.

For the successful implementation of a CMMS solution, maintenance professionals and mechanics who may have little experience with computers must be persuaded to use the software; a challenge which tends to become substantially more difficult when they have not been prepared for impending changes. It's important to open the lines of communication and spend time sharing the value of the change and establish its legitimacy with the staff members who will be responsible for its application. Surprise implementation of initiatives can be catastrophic, leaving key stakeholders alienated and creating entrenched opposition to the new solutions.

If the main value proposition for executives is ROI, the equivalent for end users is usually time saved, or ease of use. If the solution saves time and reduces hassle compared to the old way of doing things, it's important to demonstrate this fact early and often for staff, especially those who tend to be particularly resistant to change.

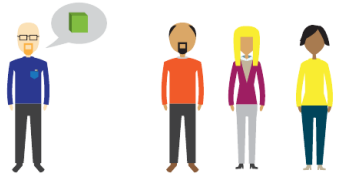
A recent Harvard Business Review article refers to this approach as identifying and focusing efforts on "skeptical change agents" rather than relying on "friendly informants" to drive buy in. When the status of an implementation is in jeopardy, retreating from strong criticism can exacerbate the situation. Instead, it is better to address issues, and the individuals who raise them, directly, respectfully and honestly.

This is much easier to do early on. If the first opposition encountered is during the implementation phase, the process will likely be an uphill battle. Involving end users from the start gives them time to get over reflexive resistance to change and provides management with time to identify and leverage buy in among the skeptical change agents.

## Focus on proper training

It can be difficult for individuals outside the software training and implementations profession to appreciate the challenges posed by low computer literacy. Even the simplest program may seem incomprehensible to someone who has little or no computer experience. This is why it is important to bring in professional trainers who know how to simplify the learning process and encourage the most apprehensive employees to ask questions.

Breaking down fear is largely a function of repetition. Studies show that software proficiency follows a "hockey stick" shaped progression. That is, the amount of time it takes to execute a given function drops precipitously between the first and tenth repetition, and continues to decline through the 100$^{th}$ before finally beginning to level out. When this data is plotted on a graph, it forms the shape of a hockey stick or a backward capital "L" lying on its back.



Training sessions should be designed with this in mind. It's a good idea to set up test environments and/or dummy data to allow users to practice and experiment without danger of making permanent changes to the program or database.

Training sessions also provide insight into the preferences of different users, which can be used in some cases to customize software for greater ease of use. Many programs allow certain features to be turned off in order to simplify the interface, and security/permissions settings can be used to restrict access and govern the types of tasks different users can perform within the program.

Fine-tuning new software in this way can go a long way toward creating buy in. In a Right Management survey of more than 28,000 employees from 15 countries around the world, "My opinions count" was ranked as the third most important driver of employee engagement.

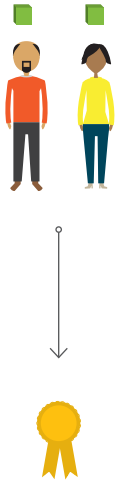
Ultimately, the most dazzling promises of cost savings and high ROI matter little if the product is forced on unsuspecting and/or unprepared staff. Investing in proper, thorough training is thus a critical way to maximize buy in and overcome initial apprehensions.

## Organizational strategies

When software is treated like a tool to be used at employees' leisure, they will treat it as such, and likely won't think twice about neglecting it if it doesn't suit them. If, on the other the hand, use of the software is added to job titles and descriptions, or incentivized with rewards, the odds that the program will be fully utilized are greatly increased.

Research by the London School of Economics suggests that "status incentives," or means of conferring the importance of an employee's position through job titles and awards, create social value that can help motivate performance. This doesn't mean that end users should be promoted to VP of operations just for using the software, but taking software use into consideration when awarding employee of the month honors, or adding software administration to official job titles and descriptions, can help turn success of the new solution into a mission-critical objective.

It should be noted that such incentives must be handled with care, however. If honors or awards are distributed unevenly, they can actually end up leaving some employees feeling alienated, so it's important to carefully consider how such incentives are designed and deployed. The key is to ensure that all incentives are tied to solid, objective measures of job performance.



In the same Right Management employee engagement survey previously mentioned, "I have a clear understanding of what is expected of me at work" is listed as the fourth most important driver of employee engagement and "I have been fairly rewarded" is ranked sixth. Maximizing buy in is thus a matter of setting clear goals and rewarding employees who achieve them. Creating status incentives can help accomplish both.

Creating these incentives is easy with the help of professional implementations staff. They generally already have key criteria they use to measure proficiency as they train, and many programs can track usage for different users, making it easy to print basic reports and determine who is using the software most effectively.

Ultimately, incentives are just one way to motivate proper software usage. The flipside of that coin includes disincentives, such as penalties and write-ups, which can also be used to drive usage. Though this may seem like an aggressive way to establish buy in, programs that track safety practices or equipment uptime carry heavy consequences for an entire organization, and may warrant the use of disincentives to enforce compliance.

Facility managers and the companies by which they are employed have many tools to ensure the success of new software systems at their disposal. The examples included here are by no means exhaustive, but they should put managers in mind of the importance of thinking through the entire implementations process, rather than halting their involvement after the initial purchase is made. Any software solution needs to be accepted by the employees who will be using it in order to succeed, and managers who are best at maximizing buy in will be the ones who will enjoy the highest ROI. **FMJ**

**Chris Mumford** is the marketing assistant in charge of content management for ManagerPlus, a leading provider of computerized maintenance management software (CMMS) for a wide range of industries. For more than 20 years, ManagerPlus has helped more than 10,000 customers maximize asset ROI, minimize downtime and streamline operations.

For more on ManagerPlus, visit www.managerplus.com, and follow the ManagerPlus blog (www.managerplus.com/blog) to stay up to date on all the latest maintenance news, insights and tips. Or, contact Mumford directly at cmumford@managerplus.com.

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Data Center Infrastructure Management Training

# OPERATIONAL COSTS *in* DATA CENTERS

BY CHRIS READ

Today's data centers are changing rapidly, with an ever-increasing focus on uptime and the constant drive for a robust bottom line without jeopardizing reliability. While many data centers are integrating new technology solutions to modernize their organizations via capital funding expenditures, understanding and focusing on operational-based savings across key areas provides a shorter-term path to improved service delivery, sustained cost efficiency and alignment to data center business goals.

While every data center's operational expenditures profile is slightly different, achieving the "right" balance between operational readiness and cost control is an elaborate challenge suitable for experienced facility management teams who understand the drivers of optimized operational performance, cost and risk mitigation. Many data center management teams are looking for something analogous to a playbook that provides context for designing an appropriate operational cost management strategy.

Successful data center management teams examine the traditional culprits of inefficiency and waste in operational expenses (such as energy, maintenance/repair costs and labor) with a keen understanding of how each cost category relates to the business operations goals of the data center itself.

A best-in-class facility management program also mitigates the risk of one of the largest "hidden" cost factors of a data center — the unplanned cost of system downtime. Driving the wrong types of operational savings may have a disastrous impact to data center operations if they result in a downtime event (see "Potential Costs of Downtime" sidebar). It is not uncommon for owners of high-performing data centers with strict uptime goals to invest in increased operational spending in key areas in order to significantly decrease the risk of data outages and potential associated business impacts. Doing so with a clear sense of how these costs components interact can drive operational savings without compromising uptime or reliability.

## Understanding cost components

In order to employ effective cost mitigation strategies, management teams must first have a strong understanding of the individual cost characteristics that drive operational spending in data centers.

### *Utilities*

Utilities typically present the single biggest expense for a data center from an operating perspective. Racks and racks of servers operating 24 hours a day, 365 days a year consume a tremendous amount of power. Having dual utility feeds (a side A and B) from two separate power grids provides nearly universal redundancy and protection from power spikes and other events. Utility costs

vary widely depending on the location of the data center and the specific systems installed, but in general terms utility costs can account for between 35 to 40 percent of a data center's annual operating costs and approximately 30 percent of the 15-year total cost of ownership of a facility.[1]

Traditionally, data center managers have largely viewed high energy costs as the price of doing business in a market that focuses first on uptime and redundancy. However, the market is increasingly shifting toward reducing energy spending. In the Uptime Institute's 2012 Data Center Industry Survey, 57 percent responded that reducing data center energy consumption overall was "Very Important." Perhaps not surprisingly, 83 percent listed financial savings as one of the top two drivers for energy efficiency pursuits.[2]

#### ELECTRICITY

Of all utility spending at data centers, electricity is far and away the largest portion. In the U.S., data centers used about 76 billion total kilowatt-hours in 2010, or approximately 2 percent of all electricity used in the U.S.[3] In a typical data center, electricity spending can represent between 93 to 95 percent of all utility costs. In addition to powering the facility and the servers themselves, much of this electricity is used to cool data rooms in order to prevent server equipment from overheating. The method of cooling provides the biggest variable in terms of overall electrical usage.

#### WATER

Because data center facilities tend to have relatively few occupants compared to offices or institutional facilities of comparable size, water costs represent only between 4 to 7 percent of the total utility cost. Data centers that utilize evaporative cooling tend to use higher amounts of water annually than other systems.

#### HEATING

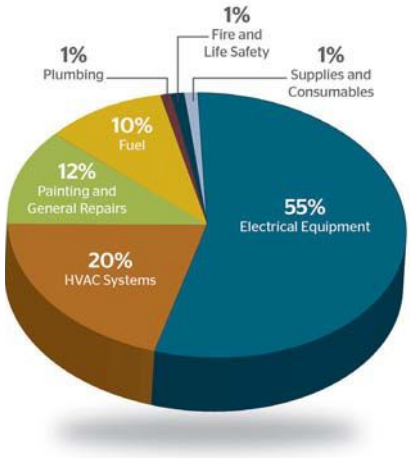
Data centers typically are faced with an overabundance of heat rejected by the servers themselves. Many data centers are now able to capture this heat for use in the non-data hall spaces of the building when needed. Facilities that do draw upon electric or gas heat to warm administrative spaces during winter months use a relatively insignificant amount on an annual basis.

### *Maintenance, repair and replacement costs*

The intense focus on maintaining uptime results in higher maintenance and repair costs, including preventive maintenance, than commonly found in other facility types. Unlike other facilities, mission-critical sites require relatively large annual expenditures for pieces of equipment that are not in active use on a day-to-day basis but which could be needed at a moment's notice at any point in the year. On average, maintenance, repair and replacement costs at data centers make up around 15 percent of the operating budget.

#### ELECTRICAL EQUIPMENT

Backup equipment and redundancy measures including uninterrupted




power supplies (UPSs), batteries, generators and associated switch gear must be routinely checked and maintained to ensure that they will operate as designed in the event of a power failure. Because these systems need to be ready to work at any moment, there is a more stringent need to check and recheck system readiness than for basic emergency power systems in an office setting. Upkeep of electrical systems typically accounts for about 55 to 60 percent of all maintenance and repair expenses.

#### HVAC SYSTEMS

Most preventive and corrective maintenance of HVAC systems can be handled by the onsite maintenance team, but some highly specific tests need to be vended out to specialty subcontractors or OEM representatives. Overall, maintaining mechanical systems represents about 20 to 25 percent of all maintenance and repair costs.

### *Site labor*

In most data centers, site labor comes in as the second largest chunk of the operating budget due to both the subject matter expertise and number of personnel required to keep a data center up and running without affecting uptime. Dedicated site labor including facilities staff, IT and security typically range between 34 to 36 percent of a data center's total annual operating budget.

#### SITE MAINTENANCE/ENGINEERING TEAM

Maintaining critical systems on a true 24 hours a day, seven days a week

### POTENTIAL COSTS OF DOWNTIME

For an organization whose facility operates with 99.9 percent uptime requirements, an outage has real financial impacts to business operations (which vary according to the nature of the organization and the type of data housed within a specific facility).

Let's consider a facility for whom every second of downtime of data results in a US$5,000 impact to operations (a not at all uncommon figure for mission critical data centers). A brief data center power outage typically results in a significantly longer IT recovery period. So for a five-second loss of power and resulting two-and-a-half-hour IT recovery time, our example data center experienced a US$45 million negative business impact.

basis requires a capable maintenance team on site at all times. Just as there is redundancy in the power and mechanical systems onsite, redundancy in site staffing protects the facility's uptime by ensuring that a deep and qualified team of technicians is available day and night.

A variety of staffing and shift models can be applied to data center operations, and the use of these varies based on site size and projected IT load, owner's uptime requirements and the limits of the operating budget. As the facility management team develops staffing models, it should aim to continuously fulfill the following three distinct but related functions needed in data centers:

- Does this minimize the risk of downtime through intervention and escalation?
- Does this allow for the scheduled maintenance of all mechanical, electrical and building automation systems?
- Does this allow for training, drills and other readiness exercises and risk management actions?

The number of engineering staff members on site per shift clearly creates a trade-off between three factors:

- **Risk profile:** The risk profile of the data center "as operated" — the staffing level and the operational model impacts how the data center is operated, which is just as important as how the data center is designed;
- **Costs:** The labor and operating costs for a data center; and
- **Work responsibilities:** The types of work responsibilities engineers can execute — the higher the staffing level, the more flexibility the team has to do work that could not be taken on with a leaner staffing model.

For a facility to be truly continuously operational, a model that includes at least two technicians on site for every shift provides the best balance of performance, risk management and best-in-class safety. In a 10- to 12-megawatt data center running 10-hour shifts, this would equate to a total base operations and maintenance team of between 20 to 24 individuals including shift technicians, lead techs and management resources. This team can be further strengthened by adding a controls specialist who manages all controls system, a CMMS planner/scheduler who schedules work orders for the engineering team and a dedicated onsite energy manager. The operations and maintenance team represents about 45 percent of the total site labor at an average data center.

#### *INFORMATION TECHNOLOGY*

Not surprisingly, having an experienced and high-capacity IT team on site is crucial to a data center's success. IT operations may either be run by an in-house team or via a third-party data center IT firm. The IT team is typically staffed at nearly the same level as the maintenance team. This translates to around 32 to 35 percent of the total site labor budget.

#### *SECURITY*

Data centers house data and applications that are crucial to the success of many businesses and organizations. While an average office building may have a security desk manned with a low-level security guard or two, creating a secure and resilient data environment requires far greater efforts. Securing a data center consists of protecting the data from unauthorized access or malicious attack, preventing issues that might affect uptime and safeguarding the physical infrastructure of the servers.

Even with a well-built environment that incorporates physical and technological security efforts, a dedicated site security team is needed to ensure that only authorized personnel access the data center and the data zones themselves. Because of this level of responsibility and the importance of regulating access to the data center, data center managers invest heavily in hiring security teams who are experienced and qualified to protect the facility's IT infrastructure and data. Most data centers of any size will require at least two security personnel on every shift to be able to control site access while still performing security rounds, and even more if security escorts are required for all visitors.

Ongoing operational security costs include the onsite labor of the security team, security camera maintenance, badge access costs and maintenance on security access points. Most data centers will spend 20 to 23 percent of their total site labor budget on security.

### *Grounds*

#### *JANITORIAL*

When compared to other major cost categories, janitorial does not represent a major percentage of the data center's overall operational costs. However, the cost for cleaning a data center is significantly more than one would see for Class A office space of the same square footage. "Think twice" training teaches employees to consider the potential impact of their actions to data center operations in advance, and data center managers pay a premium for that level of qualification in their janitorial company. Data centers also have different standards for air quality, requiring the use of some specialized equipment such as vacuum cleaners with distinct filters.

#### *ENVELOPE/LANDSCAPING*

The cost for landscaping at a data center doesn't vary much from typical commercial office or corporate campus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**SAMPLE DATA CENTER BUDGET**

For illustration purposes, let's create a fictitious data center as a reference point. In this scenario, our sample 200,000-square-foot data center handles 12 megawatts of total load, pays middle-of-the-road utility rates and operates on 10-hour shifts.

| CATEGORY | APPROX. COST *(IN U.S. DOLLARS)* |
|---|---|
| Utilities | $8,000,000 |
| Site labor | $6,500,000 |
| Maintenance, repair & replacements | $4,000,000 |
| Grounds | $500,000 |
| **TOTAL** | **$19,000,000** |

facilities. The only major difference in qualifying landscaping and grounds contractors at a data center site is to confirm that they understand the unique security requirements of the site and the importance that clean landscaping plays in intruder detection.

Understanding the proper levers to effectively influence a data center's operating expenditure budget while maintaining high uptime, reliability and risk mitigation strategies remains one of the greatest challenges facing data center operators. With as much as 90 percent of data center costs devoted to operating expenditure budgets over the life of the facility, key strategic decisions such as the investment in highly qualified management teams and the implementation of well thought-out operational savings strategies will in turn drive improved service delivery, sustained cost efficiency and a continued focus on the data center's business goals. **FMJ**

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**Chris Read** is national facility operations director at McKinstry. He draws on nearly 20 years of mission critical operations experience to help McKinstry's data center management teams effectively manage and reduce facility operating costs while meeting each client's reliability and uptime goals.

His expertise has driven many improvements in customer service, productivity, business efficiency and onsite technology for a critical environment portfolio that encompasses multiple business verticals including internet commerce, health care, utility, biotechnology, communications and more than five million square feet of data center space nationwide. Read can be reached at chrisr@mckinstry.com.

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Performance Measurement in Facility Management

# TOOLS OF THE TRADE

BY BILL CONLEY

Demographics repeatedly show that the majority of facility managers practicing today are of the baby boomer generation. Tried-and-true grizzled veterans of the war against entropy, these practitioners have learned mostly through trial and error, epitomizing on-the-job training. Some of these FMs have reached the peak of their learning levels. Having determined what works best in a facility to suit their needs, curiosity and innovation sometimes lose out to status quo and comfort levels.

Expediency and familiarity supersede change, yet the industry marches on. The external world necessitates experimentation with new approaches to keep pace with the demands of a volatile marketplace. Years ago, it might not have seemed important to monitor water usage. Greenhouse gas emissions were probably mentally relegated to controlled plant growth in glass houses. Building occupant temperature complaints were treated by manually adjusting thermostats. Technology revolved around making sure

THERE IS MORE TECHNOLOGY FOR SUCCESS AVAILABLE THAN EVER THOUGHT POSSIBLE; THE TRICK IS TO INTEGRATE IT CAREFULLY, IMPLEMENT IT PROPERLY AND UTILIZE IT WISELY.

the phones worked and spreadsheets were exercises in penmanship.

Today's FM faces challenges of a different sort. Consumption and efficiency must be closely watched: both to improve systems and to report status. Stakeholder satisfaction must be continually gauged to ensure the facility is operating effectively. Impacts on the environment are becoming regulated and scrutinized. As measuring and monitoring operational performance and activities have assumed a major role in the management of the workplace, better tools must be utilized.

The interdisciplinary interaction and intelligent networking of building, energy and communications technology in facilities, especially those with complex requirements, takes a combination of the finely honed, ingrained skills and new technology-centric ones that are becoming a part of facility management. One responsibility of the profession is to create buildings that guarantee optimal comfort and provide a healthy environment in a cost-effective manner. This entails the integration of numerous services such as HVAC, security, communication and assistance systems and is supplemented through specific sensors for light, heat and automated controls to respond to occupants' needs. Developing standards and overseeing system performance through technology helps create this type of atmosphere.

Software applications developed for the measuring and monitoring of facility and organizational effectiveness have become an integral part of managing the built environment. Various packages have been developed over the years for this purpose, most notably computerized maintenance monitoring systems (CMMS), computer-aided facility management (CAFM), integrated workplace management solutions (IWMS) and their various derivatives. Lately, building information modeling (BIM) has been added to the mix. Today's market presents quite an eclectic array of options from which to choose. Some of them work together; others are stand-alone systems. Combined with the use of a building automation system (BAS)/energy management system (EMS), these are all viable tools by which to implement processes that measure, monitor and improve operations.

## Selecting the right tool

Technological capabilities are continually evolving, and the high rate of change can be challenging. Some FMs are still uncomfortable with or intimidated by the change in perspective technology demands and the subsequent learning curve that is involved. It is no longer an issue of when these tools will be adopted by the profession, but in what shape and design. It is important that FMs not only accept this reality, but embrace it to both understand and utilize it. Priorities, standards and policies should be defined and documented. Deciding what needs to be done will determine which of the myriad available tools is appropriate and thereby provide a roadmap by which success can be achieved.

It has been said that with the right software system a person could track a rubber eraser from the time it is manufactured until the last crumb is brushed off the paper and goes to landfill. There are two things of which to be careful in this scenario. First, erasers are only for those who make mistakes. Second, if the software is used to this minute level, the user is creating a precedent for a lot of monitoring. Thus, it is important to select criteria carefully; not only in framing the monitoring parameters, but in deciding which software is appropriate for that framework. Also, it may not be necessary to take advantage of all the attributes of any particular system, but it would be smart to understand its full capabilities.

## BAS/EMS

In this day and age, most facilities should have a building automation system and/or an energy management system. A building automation system is a single control center that handles the remote monitoring and operation of building systems such as electricity, lighting, plumbing, HVAC and environmental control systems. Continual monitoring of all these systems ensures a reliable working environment for personnel and visitors and is an effective tool for resource conservation and waste minimization.

With a thorough understanding of a facility's operating requirements, optimal HVAC and lighting system timing and set-point schedules can be established. A BAS helps keep building climate within a specified range. It can schedule and control start-up/stop times for mechanical equipment and provide proper illumination in the workplace based on occupancy. It can monitor performance and device failures in systems and provide alarms if something goes amiss. It will reduce facility energy and maintenance

costs compared to non-controlled buildings. BAS systems are now available with wireless capability, enhancing ease of use and preparing facilities for demand/response programs through local utility companies.

An energy management system is sometimes understood to be the same as a building automation system but it is usually the part of the BAS dedicated to energy metering and monitoring. EMS information is more refined, as it also involves the study of the operation of HVAC and lighting systems for the identification and timely correction of problems.

Meanwhile, software is becoming available that will interconnect different facility software systems: linking BAS/EMS to CMMS programs and BIM.

## CMMS

A computerized maintenance management system (CMMS) is a software package that maintains a database on the maintenance operations in an organization. Viewed by some professionals as the nervous system of a facility, CMMS packages produce status reports and documents detailing and summarizing maintenance activities. This software records data about equipment and property including specifications, purchase date, expected lifetime, warranty information, service contracts, service history and spare parts. It helps manage work orders while tracking labor and costs. It can be used as a scheduling tool for assigning personnel to periodic tasks and reserving materials for those activities. At the same time it can supply relevant information relating to problems or failures, any downtime involved and recommendations for future action.

This information is intended to help FMs gather reportable data that will improve processes, reduce costs and allow them to do their jobs more effectively. It can also guide FMs in making informed decisions regarding systems and equipment under their purview. The CMMS may also generate metrics such as a facility condition index to measure the effectiveness of asset management and may also be used to verify regulatory compliance. CMMS packages are closely related to computer-aided facility management packages and the two programs are usually mutually supportive. CMMS can be used as a gateway, pushing and pulling information between these systems.

## CAFM

Computer-aided facility management is a software-based asset management system that supports the operations of a facility through information technology. One of the first FM-related software packages to utilize an inter-relational database, CAFM systems are linked with building drawings to create a double layer of data that can be viewed from varied perspectives.

There exist applications within CAFM for a number of functions: space planning and forecasting, move management, maintenance management, cable/IT management, equipment asset management, environmental health and safety, sustainability and electrical and HVAC. By integrating information from these various modules, CAFM lends itself to infrastructure management, which addresses the relationships between people, space and technology in the workplace.

As CAFM systems have become more established and developed, they serve now as interactive companion pieces to CMMS and IWMS programs.

## IWMS

An integrated workplace management system is a software platform used by enterprises which integrates the five key components of functionality into a single technology platform and database repository, or from a storage receptacle. It is an enterprise platform that supports the planning, design, management, utilization and disposal of an organization's location-based assets.

Derived and expanded from CAFM systems, and more comprehensive as a tool, it is a step closer to a total infrastructure management solution. Its major components are construction project management, real estate and portfolio management, facility and space management, maintenance management and a relative newcomer to the mix: sustainability. IWMS systems assist FMs in maximizing the potential of workplace resources, including the organization's real estate portfolio, infrastructure and facility assets.

## BIM

Building information modeling is a shared digital representation of the physical and functional characteristics of the built environment. It is a knowledge resource for information about a facility, designed to form a reliable basis for management decisions during a facility's life cycle. The basics of BIM revolve around the ability to insert, extract, update or modify information to support and reflect the responsibilities of the facility manager.

BIM is the life cycle management of facility support through digital technology. It is part process, part software and addresses all physical and functional conditions of a structure. This includes the optimal operation of major systems, sub-systems and components as well as those relegated to life/safety/security and access/accommodations for the disabled. All the strategic, capital and tactical planning associated with a facility could be factored based on this data. High-performance building management and sustainability introduces the additional focus of the environmental impacts of a facility operation such as energy consumption, water efficiency, purchasing and procurement programs and indoor environmental quality.

In order to measure, monitor, improve and report on a building's performance, an FM needs to fully understand the components which make up the facility; both how they are supposed to operate as well as how they are operating. BIM supports the facility management profession by delivering a robust and transparent process for monitoring and managing the built environment. Combined with BIM, the concepts of life cycle facility management,

sustainability and high-performance buildings can be interchangeable.

## The tool shed is open

Managing the built environment has grown more complex over time, as have the role and responsibilities of the FMs charged with this task. The good news is that technology tends to keep pace with this evolution. The difficult news is that facility managers need to keep up as well. Measuring and monitoring systems and processes support the core of an FM's job, providing the ways and means to achieve energy efficiency, conserve water, manage resources and deliver optimum indoor environmental quality for the health and productivity of all personnel. These tasks deal with cause and effect; amending and improving processes that aim at high-performance workplaces.

As the pendulum swings from the experienced professionals who may struggle with technology to those who have grown up with it, a balance must still be achieved. There are tricks of the trade and intuitive leaps that are a part of facility management that were learned the hard way and cannot be dismissed. But neither can they be fully relied upon. FMs need to know what happened in the past as well as what technology promises for the future.

Organizations need measuring and monitoring capabilities that can identify operating anomalies in real time, predict outcomes and deliver optimized results. Technology provides solutions to those needs. Building capacity, with the extended knowledge, the right tools and smart people, will address these challenges. There is more technology for success available than ever thought possible; the trick is to integrate it carefully, implement it properly and utilize it wisely. **FMJ**

*The author would like to thank John Rimer, CFM for his input for this article.*

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Conley has served on the IFMA board of directors, is a recipient of IFMA's distinguished member of the year award and has twice received the association's distinguished author award.

CONSUMPTION AND EFFICIENCY MUST BE CLOSELY WATCHED: BOTH TO IMPROVE SYSTEMS AND TO REPORT STATUS.

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2014

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**April** 15-17, **2014**

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IFMA's Spring Symposium offers a series of instructor-led courses that will help build professional knowledge and assist those pursuing the Certified Facility Manager® (CFM®) or Facility Management Professional™ (FMP®) credential.

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Learn more and register at
**facilityfusion.ifma.org/dc/bim-conference**

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IFMA FACILITY FUSION Conference & Expo

# OTTAWA | CANADA 2014

**March 18 - 19 | Province of Ontario**

## FM in Action

This year, Facility Fusion conference is held in Ottawa, Ontario, Canada this March 18 - 19! The smaller, more intimate setting at Facility Fusion Ottawa is a unique opportunity for those who work or have a professional interest in the region to gain valuable facility-related educational content that is specific to Canada. This setting also lends itself to more powerful networking and guaranteed professional connections.

## Why Canada?

An overwhelming number of surveyed professionals expressed a desire for IFMA to hold one of its quality educational conferences in Canada. You asked—we delivered! IFMA worked with a strategic program committee, including facility managers who live or work in the region, to develop and vet educational sessions that meet the specific needs of Canadian FMs.

**Sessions include:**

- A Brave Tale of Broad Change: From Strategic Plans to Your Workspace
- Taming the Mammoth: The Transformation of National Defence Headquarters
- WORKshifting? How Canada is Transforming the Country One Workplace at a Time
- Emergence of Mobile and Cloud Technologies in FM
- **And more!**

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It's not too late to sign up for Facility Fusion Ottawa—register today!

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# BEHIND THE BRAND

*Insight on IFMA's Corporate Sustaining Partners*

| | |
|---|---|
| COMPANY NAME | Aramark |
| EXPERTISE | Facilities management, food and uniform services |
| CSP LEVEL | Platinum |
| CSP SINCE | 2002 |
| WEBSITE | www.aramark.com |

**FMJ:** *What role does Aramark play in enhancing a company's employee productivity?*

**ARAMARK:** The incredibly diverse portfolio of services Aramark provides enables the workplace and therefore the productivity of the employees within that workplace. Our customers' employees may be committed to the organization and willing to exert extra effort, but the degree of such commitment and discretionary effort will best be recognized when conditions at work enable them to perform effectively in their roles. Numerous researchers have recognized the importance of workplace environment factors and support mechanisms when considering the relationship between motivation, effort and performance. Work environment factors, along with motivation, play a significant role in employees' ability to perform. When key supports are present, it is highly likely that employees will operate at maximum potential.

At the core of our organization is the focus we have on leveraging our scale to develop insights to fuel innovations to deliver impact to our customers' businesses. Enabling the customer's workplace and the productivity of their employees is just one example of the impact we generate. Our overarching goal is to optimize workplace reliability, efficiency, safety and productivity in support of the client's business operations. This all starts with an Aramark team that is engaged, productive and armed with the understanding of how their work enables a productive work environment.

**FMJ:** *Your core company value includes serving with passion. Explain.*

**ARAMARK:** Aramark is in the customer service business across facilities, food and uniforms, wherever people work, learn, recover and play. We recognize that we are in the people business above all else. For us to be successful in the marketplace we must be service stars and everyday innovators.

We are not a company that inspires its employees. We are a company inspired by them. Our employees are the fuel that drives our innovation. Their insights — large and small — lead to enhanced customer impact and the ability for us to deliver excellence in everything we do, every day, everywhere and every time. The star person in our logo was recently moved to the right of our name to signify that our people lead the company — with passion and excellence. United by a passion to serve, our more than 270,000 employees deliver experiences that enrich and nourish the lives of millions of people in 22 countries around the world every day.

**FMJ:** *How do we attract the next generation to the FM industry?*

**ARAMARK:** The FM industry is challenged to appeal to the next generation. Existing paradigms and lack of awareness of the profession can cast an imposing shadow over the attractiveness of an FM career path for talented people not familiar with the industry.

We can attract the next generation by cranking up our efforts to market what FM is and can become in the future. Redefining the core technical requirements by broadening the recruiting reach to include people with business acumen, analytical skills and a strategic outlook can help.

It's also critical that those recruiting the next generation revise their threshold for consideration of next-generation candidates. Shifting toward attribute-based hiring, our industry should look for indicators beyond a plug-and-play replacement that would make a next generation candidate a good fit with the position at hand. Some of those indicators are attributes such as the ability to self-motivate and consistent problem-solving qualities in various scenarios, as well as related studies and degrees, certifications and relevant experience.

This does require a hiring manager to take more of a risk so the focus during the interview process may be more about whether or not the candidate is teachable — and if that will accommodate a steeper learning curve. Aramark is addressing this risk by investing in the next generation talent pipeline with an aggressive internship and management trainee program that will powered by Aramark Academy. This is to feed our growth needs and establish a best-in-class model consistent with our commitment to the FM industry.

Behind every successful FM are a host of product and service providers that offer solutions to make the hectic task of ensuring seamless facility operations a little smoother.

IFMA's Corporate Sustaining Partners (CSPs) are trusted vendors that support the operational excellence of facility management teams. By partnering with IFMA, this elite group demonstrates the highest commitment to creating a more comfortable and efficient built environment.

This showcase goes behind the brand to reveal the culture that makes these powerhouse businesses the best in class.

| | |
|---|---|
| **COMPANY NAME** | Lowe's ProServices |
| **EXPERTISE** | Maintenance, repair and operations tools and supplies |
| **CSP LEVEL** | Platinum |
| **CSP SINCE** | 2009 |
| **WEBSITE** | www.lowesforpros.com |

**FMJ:** *Why is FM important to Lowe's?*
**LOWE'S:** Lowe's is a strong partner to support facility managers because we have a first-hand understanding of the issues that impact facility managers. Lowe's has three customer care centers, a data security building, 15 regional offices, 18 distribution centers and more than 1,700 stores throughout the U.S., most of which we own. In addition to the buildings, we also have the one of the largest privately owned and operated vehicle fleets in the country.

**FMJ:** *What is ProServices?*
**LOWE'S:** ProServices is a sales division at Lowe's that is dedicated to supporting and growing business relationships with other businesses, including businesses focused on construction and trades as well as those focused on maintenance, repair and operations — in some cases a business may have activities in both areas.

Every store has a ProServices desk located near the lumber department. Each store has four to six dedicated ProServices sales specialists/associates to assist businesses. In addition, in select markets there are account executives with a dedicated portfolio of businesses. Finally, for large national customers, we have an inside sales team dedicated to national accounts to ensure that customers have a consistent experience with Lowe's from the national level down to their local store.

**FMJ:** *What role can Lowe's play in helping FMs to save time and money?*
**LOWE'S:** We are a one-stop shop, and with more than 1,700 store locations, U.S.-based FMs are sure to find one near them. Every day, Lowe's ProServices offers businesses four ways to save time and money:

1. If your company allows you to open up store credit, we have three different credit options that save you money every day.

2. Lowe's has two great savings programs for businesses. Contractor packs are hand-selected in-stock items used frequently by businesses in large quantities. There is a 10 to 50 percent savings when you buy the minimum quantity required. They are labeled throughout the store with black and yellow labels that say "contractor pack." Volume discounts are available on any purchase of US$2,500 or more — just go to the ProServices desk and request a quote.

3. We offer a business replenishment program whereby you choose any item you would buy on a recurring basis and work with the ProServices desk to set up the program. The store will provide you with an order form you can use to either, call, fax or email for replenishment and they will provide you with shelf labels to help you keep track of inventory.

4. Lowe's offers an order ahead program so you don't have to send your team members into our stores to shop the aisles. Just place your order with the store (call, email, fax or online) and they'll shop for you. You can then send someone to pick it up or we can deliver it to your place of business.

Visit LowesForPros.com to learn more about these and other programs Lowe's has to save businesses like yours time and money.

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IFMA's Corporate Sustaining Partners (CSPs) are an **elite group of companies** that have made a powerful statement in support of facility management by partnering with IFMA. These outstanding providers contribute to IFMA's mission to advance the profession, **helping your association offer exceptional services, products, resources and opportunities**.

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Friedrich Air Conditioning Company | www.friedrich.com
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Sika
Sarnafil
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FMJ EXTRA

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BIM for Facility Management: Managing for the Building Lifecycle

# BIM AND A FUTURE VISION FOR FM

BY ANGELA LEWIS & JIM WHITTAKER

Where do you see yourself in 10 or 20 years? Perhaps a mentor, colleague or supervisor has asked you this question. However, how often is an entire industry asked such a question? In 2012, this question was posed by the buildingSMART Vision Task Force, a committee charged with developing an initial long-term strategy for the National Building Information Modeling Standard (NBIMS).

To answer the question, the taskforce reached out to industry professionals across the entire architecture, engineering, construction and operations (AECO) industry to gain perspectives on where the industry could be in the year 2021. More than 30 professionals provided narratives for various industry sectors to forecast what the future may hold for his/her profession. Using the narratives, a vision is being developed for what the future may look like and the steps the AECO industry may need to get there.

## Shaping today to support a BIM-enabled future

Building information modeling (BIM) is a digital representation of the physical and functional characteristics of a facili-

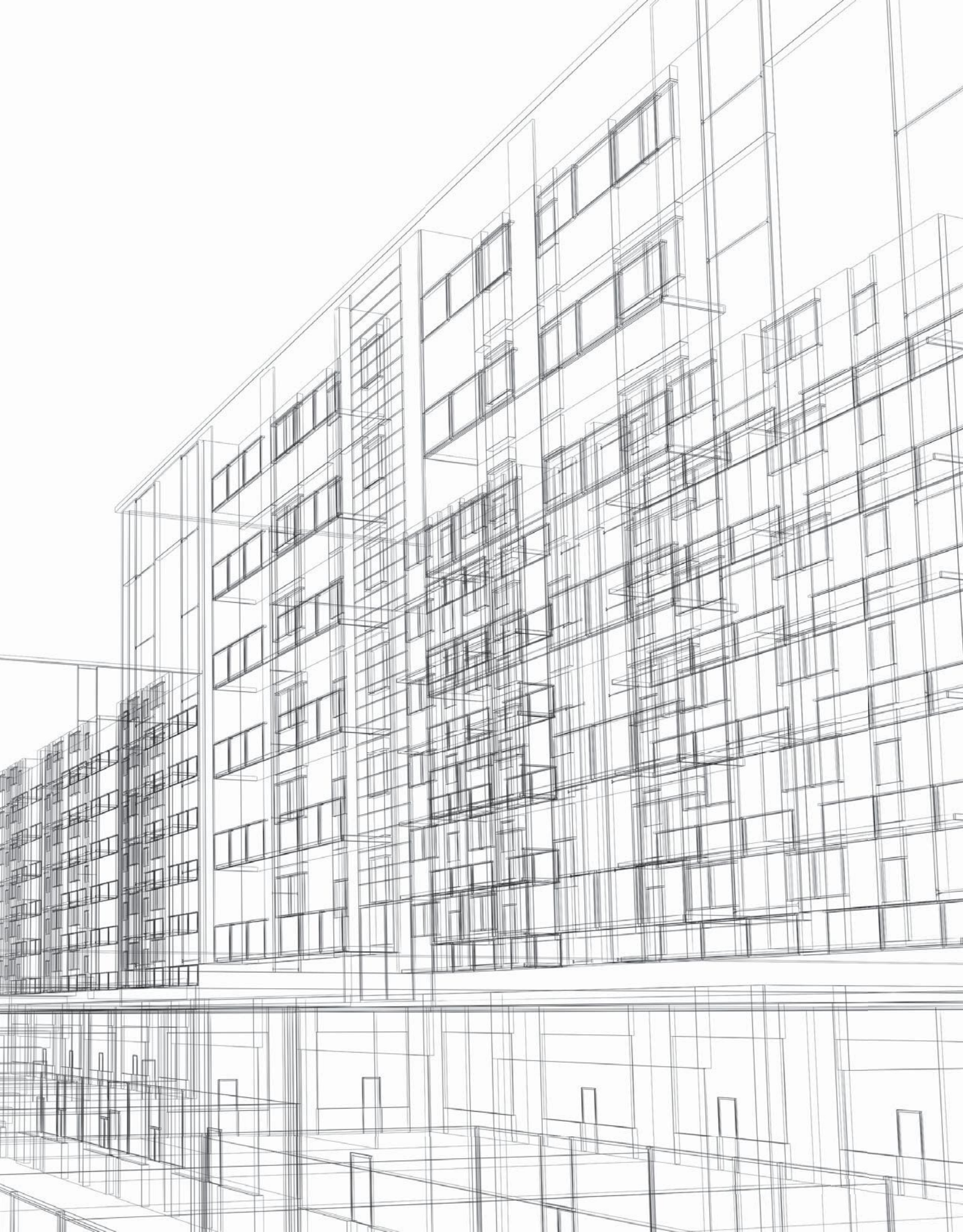
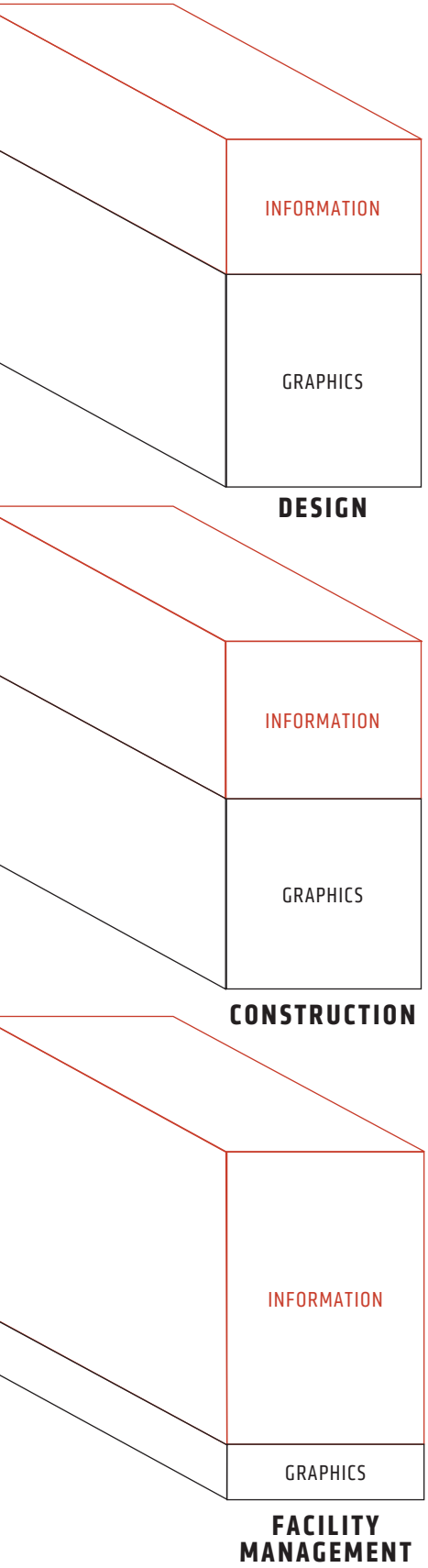


**FIGURE 1:** *Changing use of graphics and information over the facility life cycle (Burg and Mealy 2012).*




ty (NBIMS 2012). Although often initially understood by many as a graphical tool, the data that can be captured when using BIM is significant, especially for facility management teams.

As shown in Figure 1, as a facility moves from design to construction to operations, the use of information increases, while the use of graphics decreases. Designers and construction contractors use information that is often easier to depict using drawings. As a facility is built, the amount of information generated continues to increase, including such documents as warranty certificates, operations and maintenance manuals and test and balance records, and much of this information is more easily communicated through textual representations.

According to a McGraw Hill Construction Smart Market Report (2012), although use of BIM by architects and contractors is as high as 70 and 74 percent respectively, with about 67 percent design engineers using BIM, fewer facility management teams today are actively using BIM. Facility management industry leaders, such as those described in the case studies within BIM for Facility Management (Teicholz 2013), are currently seeking to define how BIM can be used by facility managers for new construction, major renovations and for existing buildings.

For example, the State of Wisconsin Bureau of Facilities Management has evaluated the type of data provided during the handover process from BIM design models and how it could be used within the computerized maintenance management system (CMMS) at a university campus. The University of Southern California School of Cinematic Arts created a proof-of-concept portal to understand how CAD managers, energy managers, commissioning managers and HVAC maintenance managers can use a software tool that integrates the document management system, CMMS and building automation system to support both graphical and information-driven facility management processes. In addition, both facility teams have a BIM guide to provide guidance for how to use BIM for new construction and renovation processes.

Leading facility management teams in both the public and private sectors are currently:

- Creating BIM guidelines for new construction and renovation projects to define requirements for architecture, engineering and construction teams providing BIM deliverables.
- Evaluating and learning about industry standards, often including them in BIM guidelines.
- Asking challenging questions about topics such as how to make the business case for BIM.
- Determining how BIM principles for new construction and renovation can be applied to existing buildings.

As industry leaders continue to define and advance the use of BIM for facility management, one of the keys to success will be determining how to broadly implement what has been demonstrated through pilot projects and developing industry standards. This includes how and at what point in the process to export data relevant to facility management teams from BIM authoring software and how to use open information exchange standards, such as the Construction Operations Building information exchange (COBie).

Two ways IFMA supports members in learning about and shaping how BIM is being used by facility management teams are the BIM lifecycle operations community of practice (BIM LO COP) and working collaboratively with the buildingSMART alliance. In 2012, the community of practice had a series of four BIM webinars, including topics such as technologies to support BIM-enabled projects and BIM fundamentals. In 2014, Facility Fusion D.C. will feature a one-day BIM conference. Working with the buildingSMART alliance provides an opportunity for IFMA to shape the direction of the National BIM Standard and participate in efforts such as the Alliance Roadmapping Initiative. The goal of the Alliance Roadmapping Initiative is to align industry

sectors to advance common goals related to technology and process improvements to support industrywide use of BIM.

## Future vision for facility management

To challenge the possibilities of today, the vision narrative for facility management in the year 2021 forecasted that the industry will:

- Have a workforce comprised of individuals who purposefully entered the profession because of opportunities to deploy new technologies and use technology to solve challenges faced by their customers.
- Have the capability to use software to make data-driven decisions based on large amounts of data for a diverse group of stakeholders, often successfully making the business case to provide sufficient funding to support the needs of the facility management team.
- Use software tools with a single user interface to access many functions, including space, maintenance, energy, asset and lease management. Open information exchange standards and naming conventions will be foundational to successful implementation of these systems.
- Maintain accurate data sets. The workforce will value and be rewarded for providing accurate data for critical facility decisions. The accuracy of most data will be validated using rules before it is imported into software databases.

The success of these possibilities will have been largely driven by the principles and processes of building information modeling. Although BIM is an important enabler, it is forecasted that BIM will rarely be discussed because its underlying concepts will have become foundational to common business practice.

## Moving into the future

Although nobody knows with certainty what the future will hold, it is already acknowledged today that building systems, including software, are becoming more complex and the amount of related available data continues to increase (IFMA 2011). To overcome these challenges and move toward the vision described, facility management teams can strive to:

- Define what data is needed and populate facility management software. Although some facility management teams continue to improve the processes for maintenance and space management, opportunity still exists to align data needs between software. Having a single, accurate data set for common information increases the ability to make consistent, defensible decisions.
- Adopt and implement standards within facility management processes and software. To support the transfer of information between software, it is necessary to adopt the use of information exchange standards. However, having well-defined and widely used processes is necessary to optimize software use. Naming convention standards should be established for all buildings, rooms and major maintainable equipment, as well as other mission-critical information.

## NBIMS – US: NATIONAL BIM STANDARD – UNITED STATES

The National Building Information Modeling Standard – United States (NBIMS – US) is a standard that aggregates reference standards, information exchange standards terms, definitions and practice documents.

The purpose of NBIMS – US is to "advance the art and science of the entire life cycle of the vertical and horizontal built environment by providing a means of organizing and classifying electronic object data and thereby fostering streamlined communication among owners, designers, material suppliers, constructors, facility managers and all stakeholders associated with the built environment" (NBIMS - US 2012).

The goal of the standard is to provide a framework to support collaboration and trust between stakeholders using an open, non-proprietary standard that is accessible to all industry professionals (NBIMS - US 2012). Version 2 of the standard can be downloaded at www.nationalbimstandard.org. Version 3 of the standard is scheduled for publication summer 2014.

The same naming standard should be used by all facility management software, such as CMMS, integrated work management systems, document management systems and building automation systems.

- Hold service providers accountable for accurate and complete data sets. Require that service providers correctly use naming standards and that the data is complete when they prepare construction documents, asset inventories and condition assessments. To do this requires providing a member of the facility management team time to perform a quality control review, as well as not accepting the final deliverables until they meet the contracted requirements.
- Challenge service providers to deliver computer-readable information. Although PDFs are a common way to deliver reports, specifications and other text-based information, it can be time consuming to find information about a specific asset within multiple PDFs. When possible, consider requiring information to be formatted so it can be imported into the CMMS or IWMS, increasing the ability to quickly assess the information in the future and increasing the value of the service provided.
- Continue to broaden stakeholder communications. Expand communication beyond the boundaries of the facility to include city planners, community leaders, emergency responders and neighboring facility management teams to align common needs with the goal of sharing information and resources.
- Get involved with the IFMA BIM LO COP and/or the buildingSMART alliance. For more information about the COP, see www.ifma.org/community/ifma-groups/group-details/bim-lifecycle-operations-community-of-practice. For more about the buildingSMART alliance, visit www.nibs.org/?page=bsa.

When accurate and complete data sets are available and can be used by multiple software solutions, facility teams can more effectively serve customers while reducing costs. Shaping the future depends on how each of us acts as individuals and members of the industry. How will you act today to shape future use of BIM for facility management? **FMJ**

**NOTE:** *This article provides a snapshot of the possible future of facility management with a focus on the impacts of building information modeling. If you feel there is something missing or if the article sparks new ideas, please share these with the taskforce by posting your ideas and comments on the FMJ blog or emailing the authors. As stated by Peter Drucker, management consultant and educator, the best way to predict the future is to shape it.*

*This article was written as part of the National BIM Standard – United States 2021 Vision Task Force (VTF), an effort of the buidingSMART alliance. The VTF, chaired by Chris Moor, collected more than 30 visionary papers from all corners of the construction industry in an effort to build a roadmap for the industry to become more efficient. The alliance is weaving the essays together to create a single, compelling and tangible vision of what the future may look like, along with the steps the industry may need to take in order to get there.*

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# MAKING THE FM CASE FOR MILLENNIALS

BY ERIC TEICHOLZ

A recent New York Times article by Tom Agan ("Embracing the Millennials," The New York Times, Nov. 10, 2013, p. 10) makes a strong case for millennials (those born from ca. 1980-2000) being "uniquely situated to take innovation to a new level." The thesis of Agan's article is that innovation thrives "when information is unfettered, education is nurtured, people can readily form new groups and decision-making is inclusive."

Real-time access to data — both structured (e.g. rows and columns) and unstructured (e.g. sensor and social media output) plays a significant role in enabling innovation. For millennials, data is transparent and social media data (tweeting, video, emailing, texting, etc.) completely permeates every aspect of their lives. Many companies accept that millennials, with their ability to rapidly innovate, create, learn and adapt to new situations as well as their desire to be challenged, their flexibility and their desire to simply have fun in their work environment, should be treated as significant assets by more senior staff who often tend to resist change.

In general, the millennial generation tends to be collaborative, open-minded, highly educated and ambitious. The challenge for management becomes how best to understand, utilize and focus their skills to achieve the organization's strategic objectives.

The Times article cites a number of examples of universities (e.g. Northwestern) and companies (e.g. Kraft, Proctor & Gamble, Goldman Sachs) that understand the link between learning and innovation. Such groups have developed specific management policies that incorporate millennials, often by pairing them with older, more experienced managers and including them at the highest level of decision-making. Mike Marasco, head of Northwestern's award-winning research program indicated (according to the Agan article) that "millennials work more closely together, leverage right- and left-brain skills, ask the right questions, learn faster and take risks previous generations resisted."

## The FM problem

Given that an increasing number of organizations believe that the successful integration of millennials with experienced staff is the fastest path to innovation, we must ask why facility managers have not yet realized how important it is to embrace this demographic cohort. If current attitudes continue, the profession of FM as practiced today might disappear or at least be diminished because of its inability to attract young members.

The author is not aware of any public or private organization that either benchmarks the number of millennials employed or has established a millennial recruitment program. And yet professional FM organizations claim that there are more FM jobs available than there are trained applicants available to fill them. AT&T, for example, currently has about 1,000 facility professionals at the management level and up. The company expects that 30 percent of this workforce will retire in the next five years and more than 70 percent will retire over the next 10 years.

Enrollment in the IFMA Foundation's accredited FM degree programs currently totals about 800 students. Assuming that a student's study extends over four years, only 200 students per year graduate from these programs. Jeff Tafel, current president of the IFMA Foundation, stated that "it is fairly common for students of these accredited FM degree programs to have multiple offers upon (or even before) graduation, with starting salaries in the US$50- to US$80,000 range. We continue to receive reports from our accredited schools that there is a 100 percent placement rate for those looking for FM jobs after graduation."

The challenge for facility management thought leaders is therefore twofold. First, to reach out and educate millennials concerning the importance and challenges of FM (e.g. energy, resiliency, sustainability, building operations and management, employee satisfaction and retention, technology, etc.) as well as the expanding job opportunities within our profession. Second, to educate organizations concerning the advantages of hiring millennials, how to train them in FM, how to effectively communicate and challenge them to use their unique capabilities, how to retain them and finally how to share best practices related to these issues.

Typical millennial characteristics include:

- Confidence
- High levels of achievement
- Parental pressure to pursue education rather than a trade
- Optimistic view of life
- Concern with community activities
- Integration of technology into all aspects of their lives
- Global and inclusive perspectives toward problem solving
- Insistence on job satisfaction
- Preference for team participation in both work and play

The facility management industry should consider how best to integrate such characteristics into the day-to-day tasks that FMs perform.

## Pointing the way to a solution

Based on what we know, there are many things facility managers can do to attract millennials. These include:

- Involvement with important issues.
- Millennials are ambitious — they like global challenges and have a sense of community. Problems of energy, sustainability, emissions and climate change are all environmental issues that FMs face and to which millennials are attracted. Energy has a strong technology component and its effective management increasingly impacts an organization's efficiency and bottom line.
- Utilize their technological experience and expertise.

A recent study by CISCO indicated that almost 25 percent of millennials take an organization's technology policies into account when considering employment. A heavy focus on technology (especially social media) is increasingly becoming a necessity for facility managers as well. Mobile computing, real-time sensor input, the increasing importance of BIM, the need to manage building automation systems and the incorporation of tablets, GPS technology and smartphones for a variety of CMMS applications will all resonate with this generation.

In addition to FM's increasing use of data, cities are collecting structured and unstructured data associated with energy, emissions, technology and transportation infrastructure, climate change and sustainability. FMs are just beginning to articulate how to use and integrate these open data sources with their internal systems. The Internet of things, big data, open data, smart cities and the city as a service are all technology-based terms that increasingly will impact FM. This will be a challenge that millennials can play an important role in meeting.

## Create workplaces that augment millennials' assets

It has been estimated that 70 percent of the job opportunities available by the year 2025 will be filled by millennials. This cohort represents the fastest-growing segment of the U.S. workforce. That means that facility managers, if they expect to hire individuals from this pool of 75 million individuals (by 2025), must

understand how to use their unique set of skills and satisfy their singular expectations. To this end we may have to repurpose the workplace of the future.

As previously noted, millennials are most innovative and creative when they work collaboratively. In order to attract millennials, highly innovative companies structure their spaces to incorporate play as well as work, provide centralized technology infrastructure to support collaboration, incorporate structured and unstructured staff interaction, support hoteling and telework, incorporate dynamic work space assignment with few offices and desks and provide opportunities that promote job satisfaction. Google, for example, encourages its engineers to devote up to 20 percent of their time to their own projects. Many of these workplace concepts incorporate a strong technology component and positively impact the bottom line by providing an opportunity to minimize an organization's real estate footprint in addition to reducing the expenses of employee turnover.

The active recruitment of millennials is essential to the future survival of today's organizations. It has been demonstrated that companies derive major benefits from successfully integrating millennials into their workforce. The workplace of the future will treat its employees as well as they treat their customers. Our job is to plan for the development of an infrastructure that supports and nurtures the strengths of young people and mentors them. Facility managers must likewise incorporate millennials into their organizational structures and determine how best to recruit, educate, manage, motivate and retain this cohort. **FMJ**

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Teicholz also co-edits the International Journal of FM, is on the Advisory Council of the Division of Capital Asset Management for the Commonwealth of Massachusetts and is a professor emeritus at Harvard's Graduate School of Design. He can be reached at teicholz@graphicsystems.biz.

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# IFMA REBRAND: AN IMPLEMENTATION PICTORIAL

*IFMA's new logo continues to shine and is being seen around the globe in 2014.*

BY STEWART DALLAS

There are by now many fantastic examples we wanted to share of how IFMA and our chapters and councils are using the new IFMA brand. Our thanks to those you see here for their great work implementing the current logo. These examples are successful because they unify the IFMA brand — they show pride in being part of the IFMA family, but also incorporate the regional flair that makes IFMA what it is to so many people around the world.

Many thanks for your continued support of this project. If you still need your official chapter or council logo, go to www.ifma.org/logo to download the file and begin using. Please feel free to contact us directly with any questions at +1-281-974-5671 or stewart.dallas@ifma.org. We expect to hear from folks and will endeavor to help everyone in this transition as much as possible. Have fun implementing the new IFMA look! FMJ

**Stewart Dallas** is Director of Marketing at IFMA. He heads up all aspects of IFMA's online and offline marketing, branding, CRM, email, positioning and product promotion. He is a proud Scot and graduate of the University of Strathclyde Business School in Glasgow, Scotland, U.K.



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- Jay Drew, SFP, Connecticut State Legislature

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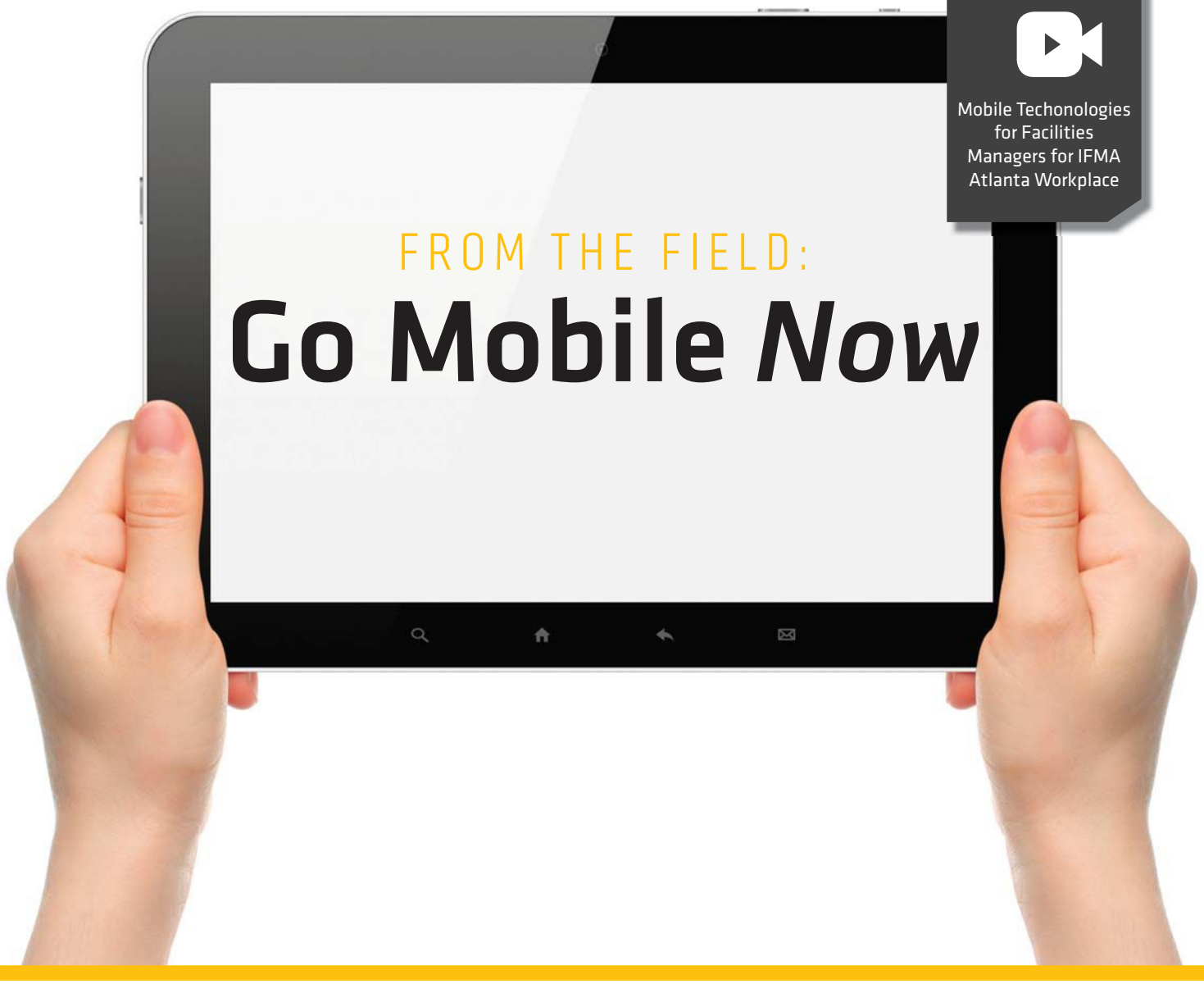


## FROM THE FIELD:

# Go Mobile *Now*

BY MARTE BYRNE

There always seem to be obstacles when I talk to colleagues about going mobile. Some are concerned about potential resistance from their FM technicians; others worry about getting the project funded in a world in which technology dollars tend to roll toward sales and marketing functions. Still others wonder how mobile solutions will be embraced once rolled out.

All of those concerns are legitimate. But from my own recent experience of administering a rollout, I can say that these problems melt away under the clear logic and benefits of a mobile FM solution. The following case study examines the needs we had (likely similar to those of most other organizations) and how we went about assessing those needs and then creating, piloting and successfully rolling out a mobile solution, as well as the benefits we've seen since and some operational best practices.

### Case study: Seeking a centralized solution

Boston Scientific is a leading innovator of medical solutions that improve the health of patients around the world. It has about 24,000 employees and 12 manufacturing facilities worldwide, a market presence in nearly 100 countries and annual revenue of about US$7.25 billion. With such a large facility portfolio, we had long seen the logic of using technology to assist in its management.

Prior to beginning this project, we used a collection of internally developed FM solutions to manage our facilities in Arden Hills and Maple Grove, Minn. The FM teams from both sites worked closely

and over the years had developed four work request systems. The goal to enhance efficiency by reducing this to a single, centralized system was accomplished through the deployment of CAFM software.

Over the next two years, the centralized system worked as planned. However, we soon saw the need for a way to access the system from the field, especially because the Arden Hills facility consists of 10 buildings across a 101-acre campus. Mobility seemed like a logical solution.

## Assessing needs

As we began assessing the needs for a mobile FM solution, we conducted a crucial first step: consulting internally with our FM technicians.

Involving those who would actually be using the tool on a daily basis was critical for two reasons. The first was the nuanced real-world experience they could contribute to the needs list and the second was the ease of deployment and adoption facilitated by involving the end users in the tool's creation from the beginning.

Working with managers and technicians, we created a needs list that included:

- **Freedom from the desk.** We needed a solution that would free staff from the desk and from paper forms. One of the first requests that surfaced in our assessment meetings was for the ability to close a work order and pull up the next from the field rather than having to return to a designated workspace. With 10 buildings on campus, the FM team wanted the ability to search work orders by building to confirm if additional work was needed prior to moving to a new building.
- **Rich graphic content.** From involving the technicians in early needs assessments we learned they would value browsing building floor plan maps to allow them to match offices and other spaces on the campus to work orders. They also wanted access to online documentation for barcoded and other equipment, including the ability to bring up maintenance records, warrantee information, technical manuals and other resources.
- **Tablet-sized device.** To support the wealth of online content and related graphics, our technicians wanted something larger than a smartphone, but still very portable. We decided to provide all of our FM technicians with tablets.
- **Camera integration.** Our technicians had long used digital photographs, but in the past these had to be sent as email attachments and joined to the appropriate file later. We wanted the ability to take a photo of a leaking pipe, damaged part or any other object and have it directly integrated into the work order or report.
- **Barcode integration.** We wanted our technicians to be able to use barcodes to immediately pull up all relevant maintenance or manufacturer information for equipment.
- **Share the information beyond FM.** Early on we realized that our technicians weren't the only ones who would benefit from a campus map and the ability to locate our 170 conference rooms or the nearest copy center or cafeteria. We implemented a mobile Web app for use by all employees at the two sites.

Another early decision was to work closely with a business partner that had experience in deploying mobile FM solutions. We had established a close working relationship with the vendor that deployed our centralized FM solution two years earlier and needed someone who knew the mobile side of FM. Working with a partner with strong mobile FM experience helped ensure an efficient and complete deployment.

## Pilot and rollout

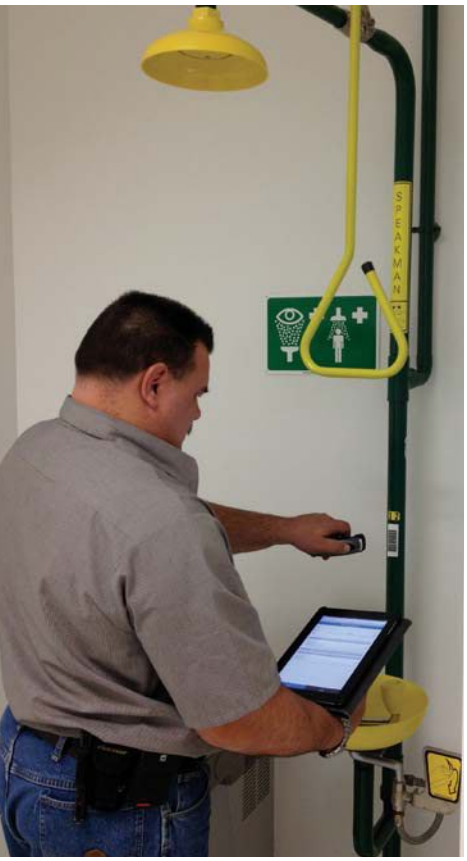
In addition to working closely with our FM technicians for the needs assessment, we continued to involve them during the prototype and approval process. For example, we shared images of the app to make sure we were meeting their needs in a clear, concise and user-friendly manner. Working together with both our business partner and our technicians we were able to customize exactly which elements we wanted to use.

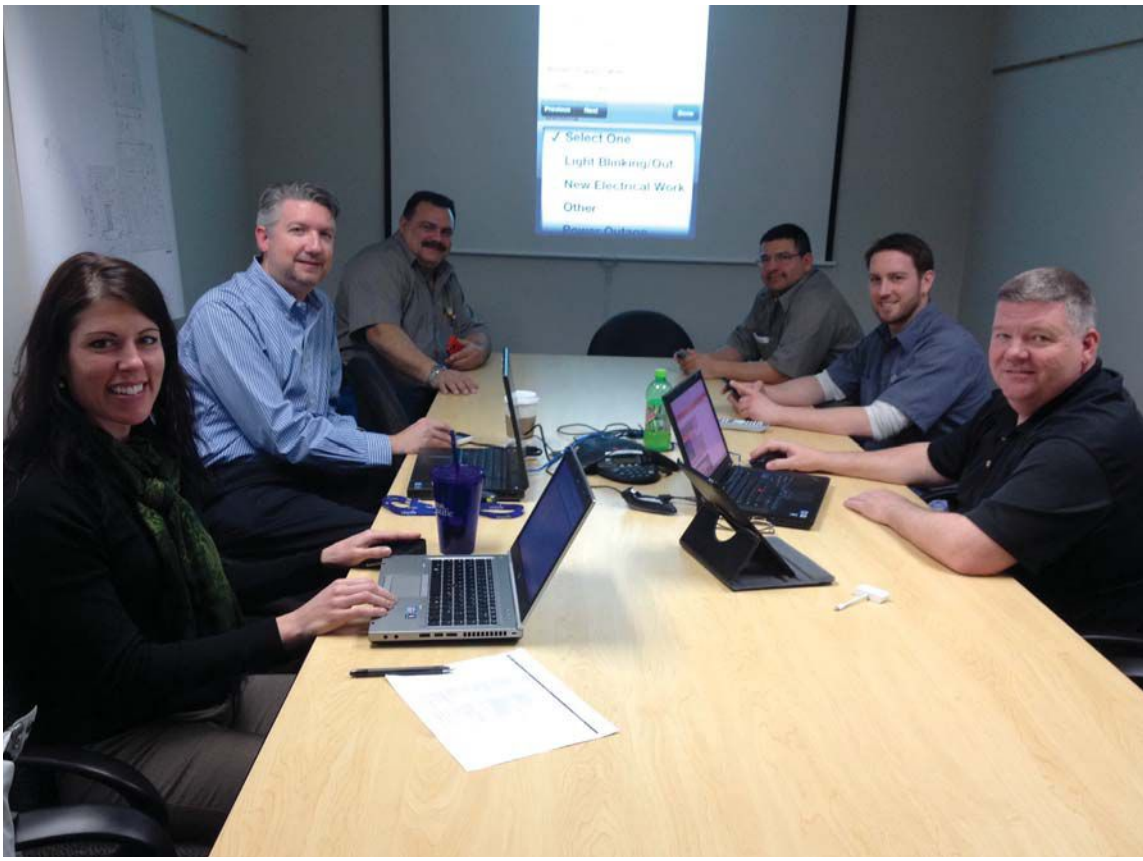
The flexibility of the FM mobile Web app we implemented allowed us to brand the solution as a company application (we call ours ServiceZone) to match the look and feel — as well as the terminology — with which our technicians and other users were familiar.

We felt confident in the final product because we involved our technicians and other stakeholders throughout the development process. But to be cautious, we began with a limited pilot program. After equipping a group with iPads running our mobile FM application, we spent time with them, walking around campus from building to building as they worked, just to make sure everything was functioning smoothly. Soon after, we went live, deploying the app across both sites. The project, from beginning of the first planning sessions to the final rollout, took about six months.

Looking toward the future, we see additional opportunities for bringing rich content online. Near term, we see value in adding outdoor equipment and sites to our mapping. This would allow us, for example, to report and record remedy of a burned out parking lot light or to report and remedy an icy sidewalk on campus. We also met with our safety group to discuss adding safety equipment such as fire extinguishers to our mapped data for barcoded inventory and proactive maintenance flagging.

Looking further ahead, we see value in integrating a more complete set of CAD drawings that would enable workers to overlay a view of HVAC, plumbing or electrical layouts.






WE FELT CONFIDENT IN THE FINAL PRODUCT BECAUSE WE INVOLVED OUR TECHNICIANS AND OTHER STAKEHOLDERS THROUGHOUT THE DEVELOPMENT PROCESS.

## Benefits of going mobile

Since going live with our mobile FM solution, we've seen plenty of benefits, including:

- **Happier, more productive FM technicians.** The mobile FM solution has been enthusiastically embraced by technicians and other stakeholders. Just as they envisioned, our technicians can now open and close work orders from the field and can see if there is more work to be done in one building before heading to the next.
- **Centralized information.** As the name implies, ServiceZone has provided the centralized repository we needed. "Before ServiceZone we had to go out to multiple sites — one place to find a person's extension, somewhere else to find a map of where they were located and yet another area to send them an email," one of our facilities technicians said. "With ServiceZone, everything we need is on one site. Just click and you are there."
- **Graphics make work easier.** Our technicians love the ability to see exactly where they need to be, as well as taking advantage of online documentation. The wider employee population has also embraced our app to find rooms and other resources that they need.
- **Easier documentation with camera and barcode integration.** As anticipated by our techs, having the camera and barcode reader directly integrated with our mobile FM solution has greatly simplified their ability to create complete work records.
- **Tighter SLA performance.** Our FM technicians take pride in their work and like the ability to close work orders from the field immediately

upon completion. Apart from emergency work, we provide a five-day service level agreement. Since rolling out our mobile FM solution, we've gone from an average completion time of a five-day SLA to just two to three days. Our technicians can work faster because so much information is immediately available from the field. One of our facilities managers noted: "ServiceZone has allowed facilities to experience continuous improvement meeting customer service needs, managing job workflow and making gains enhancing quality, cost savings and customer service deliverables across all of our service centers."

- **Going green.** A completely unplanned benefit was the reduction in printing work orders and other materials. One of our technicians said, "I have been able to go green and reduce printing work orders by 80 percent because I have all my work orders on my phone."

## Best practices

- **Involve technicians from planning through deployment.** They will bring great ideas, offer in-the-field wisdom and provide the momentum for a successful launch and meaningful adoption.
- **Work with a partner who knows mobile FM.** There is great value in working with someone who has significant knowledge of FM in general, and mobile FM specifically. Our vendor was an invaluable resource, providing creative solutions founded on a deep level of knowledge and experience.
- **Get management visibility.** There is a powerful case to make for mobile FM; let management know this. Work with your business partner to create examples of the impact this will have on your operations. This will help justify required hardware and software costs.
- **Talk to those who have done it.** Seek out help from FM software and technology consultants, current business partners and even other companies that have done this before and can share the pitfalls, technology and best practices for a successful mobile implementation.
- **Gather pre-deployment metrics.** One thing I wish we had done prior to deployment was capture metrics on job completion and other factors so we could better quantify the improvements we've seen.
- **Do it now — don't wait.** If you don't yet have a mobile FM solution, start planning it now.

The take-home message is simple: Now is a great time to go mobile. **FMJ**

## THE TAKE-HOME MESSAGE IS SIMPLE: NOW IS A GREAT TIME TO GO MOBILE.

**Marte Byrne** is senior facilities manager for Boston Scientific. He has been with the company for 25 years focusing on the role of facilities planner for the past 13 years. Project management, including programming, design and construction/implementation, is his core responsibility.

Byrne has been using CAFM software and technology since 2009 when initially implementing a system for use at Boston Scientific's 1.8-million-square-foot Saint Paul, Minn. site. Since that initial implementation he has expanded the system to four sites and more than 4 million square feet.

## Accept the Challenge –

# Be a Voice for FM

**If you have an interest in influencing legislation that impacts your profession, then plan to join agency, congressional and industry leaders this July to address issues of importance to facility management.**

# IFMA's Advocacy Day & Public Policy Forum

July 15 - 16, 2014 | Washington, D.C., USA

**Every FM in every U.S. state has the opportunity to make a difference in the continued advancement of the profession.**

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*– Tom Meyers, Dyson Commercial*

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*One-on-One with*

# ROBERT SHUCK

*Robert Shuck, FMP, SFP is director of contracts, facilities and sustainability for Goodwill of Silicon Valley. He has more than 20 years of experience in operations management with a specific knowledge of transportation, P&L responsibility, assembly, logistics and warehouse management. Shuck manages 250,000 square feet of distribution warehousing and 19 retail locations, and during his tenure at Goodwill he has coordinated an efficient operations program that involves more than 140 employees. He is also a long-time member of the IFMA Silicon Valley Chapter.*

*FMJ recently had the chance to catch up with Shuck and learn his FM story.*

**FMJ:** *How did you first get into FM?*
**SHUCK:** I have worked in warehousing, logistics and operations for about 20 years. I fell into the facilities end of it just because no one else wanted to do that work. I began at a startup company in the '80s. No one was in charge of facilities, so they gave me the job. It was pretty much baptism by fire back then — things needed to get done, so I'd have to research the problem and come up with a solution. There was a lot of trial and error.

**FMJ:** *Coming from warehousing to FM, what was the easiest part of the transition?*
**SHUCK:** I'm still in warehousing at Goodwill. I used to do production lines for HP and Sony, and I've never really gotten out of that. I think FM runs hand-in-hand with the situations you deal with in a warehousing environment (safety, forklift certifications, etc.).

**FMJ:** *What led you to IFMA?*
**SHUCK:** I'm a veteran, and we do a homeless veteran's program here at Goodwill. When IFMA started their veteran's initiatives, a gentleman named John Hackett came to Goodwill to see what we do. He was just walking by my office, and the guy he was touring with mentioned that I was a veteran and running the facilities. I had never heard of IFMA before. He invited me to one of their meetings, and I went and ended up joining. Then I got a diversity scholarship and got the FMP™ certification, then the SFP® certification and now I'm studying for the CFM®.

**FMJ:** *How have those credentials helped you move forward in your career?*
**SHUCK:** They really opened my eyes to things that I never thought about. I've been able to network through IFMA to get different perspectives instead of having to reinvent the wheel. I manage 175,000 square feet of our main facility (headquarters transportation contracts and programs) plus 19 retail stores. We're healthy and so we have been able to invest in infrastructure, including remodeled and new stores. It keeps me busy.

**FMJ:** *Can you tie some of the knowledge from your networking and courses into the ability to help with that turnaround?*
**SHUCK:** It's helped me a great deal to understand the effects of what we're doing. We've implemented energy management through portfolio manager and lighting retrogrades in all of our stores. Whenever we do a remodel I bring up the sustainability and the people, planet and profit aspect. Before I pretty much just got things done; now it's more strategic, looking at the impact down the road. It's been an eye-opening experience. Before I wasn't always able to see the big picture. It's made me step back and rethink a lot of the things we do.

**FMJ:** *What about the process for getting the certifications?*
**SHUCK:** I found the FMP pretty easy because I had been practicing for so long; it just gave me names for things I was already doing. When I first went to the FMP class I brought the literature to my CEO, Michael Fox, who came from wholesale distribution and has an MBA. He reviewed everything and said "This is MBA-level material." Goodwill has financed my IFMA classes and supports what I'm doing.

**FMJ:** *Who was your instructor?*
**SHUCK:** Larry Morgan — he was great. He broke everything down into simple terms. All of the material was fun, although the SFP was a little out of my comfort zone. I hadn't really thought about things like lighting pollution before. I also took the CFM review with him — he's a great teacher. **FMJ**

**WHAT'S YOUR FM STORY?** *Tweet using* **#FMStory** *or share on the FMJ Facebook page or Blog FMJ.*

# Empowering the Customer through Self-service Technology

BY GARY WATKINS

Customer service is an important part of a facility management professional's role. But the growing global trend for self-service technology is revolutionizing that aspect of FM, and with it, the way people select and purchase products and services.

Shoppers now pay for their goods using self-service checkouts; travelers print out their own bus, train and airplane tickets. Hospital patients check in at kiosks, which improves service levels while helping to ensure that patients' data remains secure. Recent hardware trends, including the growth of tablet computer and smartphone use already prevalent in the consumer market, are being deployed by commercial organizations to support self-service working and underpin continuous business operations.

The facility management profession around the world is mirroring this trend, using self service to transform the way in which it operates. By empowering office workers to log maintenance requests or book meeting rooms online at their convenience instead of visiting a manned helpdesk, engineers and support staff are able to receive, update and complete tasks on the move using mobile devices.

The traditional helpdesk model often attracts criticism for being a reactive, non-agile ticketing system through which jobs take too long to complete, service levels are not aligned with key performance indicators and staff are frustrated with the perceived lack of activity once a job has been requested.

A white paper published by Symantec[1] suggests that the traditional helpdesk struggles to keep abreast of the service demands typically found in today's businesses and that the impact of slow service delivery can profoundly affect not just customer perceptions but can also extend across the whole business. This is often the case when service operations score low on customer satisfaction, which diminishes the IT department's reputation and value to the business.

This research highlights the value of investing in self-service implementation to achieve a more streamlined method of managing facilities, maintenance and booking requests.

## Benefits of self service for FM

Self service offers many benefits for facilities departments and service provider organizations, delivering substantial efficiencies both at an operational and a strategic level. These include:

- **24/7 environment.** Self service is available to staff and customers on a 24 hour a day, seven day a week basis, ensuring that requests are logged as soon as possible and therefore improving rectification times and increasing customer satisfaction.
- **Reduction in job logging time.** Because jobs are logged via the Web, systems are able to prepopulate jobs with pertinent data such as staff information, location and fault type, therefore reducing the amount of time it takes to resolve and document the job.
- **Increase in staff productivity.** Staff are able to log jobs or book meeting rooms more quickly, allowing them to focus on completing their day-to-day tasks.

- **Elimination of duplicate tasks/bookings.** Users can easily view previously logged requests within a building or particular area of work, ensuring that fewer jobs are duplicated. Enabling staff to view available meeting rooms or desks also reduces double bookings.
- **Improved communication between client and helpdesk.** Self service delivers contractors, staff and customers with instant access to real-time job information, irrespective of location, which significantly improves the communication between all parties.
- **Improved contractor performance.** Instant access to information allows engineers to start and complete assigned jobs more rapidly. In addition, if while completing a job in a particular location an engineer discovers a new fault, the technician has the ability to log the job (including any supporting photographs) instantly.
- **Helpdesk efficiency.** Self service eliminates the need for helpdesk staff to answer high volumes of telephone or email enquiries. This allows them to become far more proactive, managing existing jobs and prioritizing resources rather than logging requests. Automatic job assignment to the most appropriate contractor further improves efficiency.
- **Reduced operational costs.** With improved helpdesk productivity, the requirement for extra resources is reduced, delivering expenditure savings in terms of salaries, occupancy and infrastructure costs.
- **Administrative savings.** Since the majority of jobs are logged online, the workflow process becomes more streamlined, allowing engineers and helpdesk staff to spend less time managing paperwork and other administrative tasks.
- **Space efficiency improvements.** With flexible or remote staff gaining greater access to available desk space or hot-desk opportunities through self service, they have more control over space allocation and feel secure that a workspace can be reserved when visiting the office. This enables staff members to become more productive and motivated.

## Who benefits from self service?

Every individual related to a maintenance or booking request can benefit from self service, including:

- **Building users.** This accounts for any staff member or end user who might need to log a request; whether it is a teacher or nurse logging a request to have an important piece of machinery repaired or an office-based staff member with a catering request for a meeting room.

Through self service, users can rapidly log requests via an intuitive interface which removes the potential for errors and ensures that their request is assigned an appropriate rectification time. They can track the status of a job or booking from start to completion and can log any notes to help facilitate job completion.

THE TRADITIONAL HELPDESK STRUGGLES TO KEEP ABREAST OF THE SERVICE DEMANDS TYPICALLY FOUND IN TODAY'S BUSINESSES.

- **Remote/mobile engineers.** Utilizing self service on the move can significantly enhance the work of engineers carrying out maintenance or service requests, whether they are in-house staff, remote engineers or contractors. They can receive, update and complete jobs remotely via tablets or smartphone devices, thereby improving job rectification times, enhancing service levels, reducing administrative and operational costs, and achieving greater job satisfaction.
- **Helpdesk staff.** Self-service functionality enables users to log, view and update jobs themselves; therefore traffic coming into the helpdesk is significantly reduced. This allows the helpdesk to be proactive rather than reactive and allows staff to concentrate on ensuring that work is being completed on time instead of spending time manually logging jobs.
- **Support staff.** Support staff (those responsible for setting up equipment and providing catering) are informed of any specific requirements for the day and can plan their workload accordingly. This improves the level of service provided to meeting attendees, enabling them to focus on the meeting itself rather than wondering where the projector is or why the room is too hot or cold.
- **Senior management.** Self service, as part of an FM software solution, gives senior management access to an array of reports and dashboards that offer visibility of the performance of assets, buildings, bookings and resources. This delivers insight into budgets, contractor spending and KPI performance to help justify future spending and enable informed strategic decision making.

## Marketing self service to optimize uptake

Since many users are reluctant to accept changes from their normal routine and can potentially revert back to established working practices, post implementation can often be the most difficult and crucial time. It is imperative that staff buy into the self-service offering and the benefits it entails. Collaboration between facilities, marketing and operations teams is vital: by leveraging internal communication channels, businesses are able to educate staff on the benefits of using self service and ensure user acceptance in order to fully realize the benefits to the organization.

When promoting self-service to staff and customers, due consideration must be taken to address the different profiles of those who will be using the system. For example, while an office-based employee may frequently access a corporate intranet, a field-based engineer may be less inclined to do so. Leveraging a broad range of communication channels to promote the self-service solution, such as those already listed, will ensure wider user acceptance.

Means of marketing the self-service offering may include:

- **Golden self-service login.** Supporting the centralization of helpdesk operations, this provides users with an easy-to-remember login. It can be communicated throughout the business as the login for all bookings or maintenance enquiries and could be used as a hashtag for social media (see below).
- **Social hashtagging.** For the more technically savvy users, offering a unique hashtag on Twitter or any other relevant digital communication channels (such as #SelfService) drives employee engagement between staff and the helpdesk, offering a quick way for staff to communicate any booking requirements or service issues with the system.
- **Company intranet.** Since an intranet is usually where all pertinent company information is stored and advertised, with all staff generally having access, it provides an ideal channel for communicating self service across the entire organization. The key benefits of self service should be included to promote user acceptance.
- **Internal communications.** As with an intranet, communicating the service through company-wide newsletters or magazines can improve the understanding of the solution and its benefits, reaching all necessary staff members.
- **Branding.** It is important to ensure that the self-service tool is branded in accordance to the company's brand guidelines. This will enable staff to relate to self-service as being part of the business and feel comfortable using it to log any maintenance or booking requests.
- **Satisfaction surveys.** A useful tool in measuring and understanding the level of employee and client satisfaction with the self-service solution. Surveys help to secure opinions from employees on how the solution works and its impact on staff. Feedback gained from such surveys may be used to drive potential future software enhancements.

By comparison, when communicating the benefits of self service to remote or mobile engineers who may not be as receptive as the general workforce, it is important to ensure that they feel comfortable with the operational change. Means of marketing self service to engineers may include:

- **Training guides.** Guides provide users with an in-depth summary of all the features of self service, particularly useful for those using it to its fullest capacity.
- **Email campaigns.** By providing engineers or staff with relevant updates before and after the launch of the self-service solution, emails ensure that self service has been sufficiently communicated and that staff have all the necessary information required to maximise its usage.
- **Workshops.** Workshops offer staff the opportunity to gain first-hand practical experience of the benefits that self service provides, ensuring that staff become more confident in using the various system features.
- **Online demonstrations.** Offering high-level demonstrations of self service through online video tuition enables staff to understand in greater detail how to unlock the various functions of the software. The ability to view the demonstrations as many times as is required helps staff maintain and develop their knowledge and improve their skillset.
- **Q&A.** This could be a face-to-face session during which experts aim to provide guidance and answers to any questions that staff may have, or as a dedicated section on the company intranet whereby engineers or staff can submit questions and receive responses online.
- **Champion users.** Assign a member of the team to become an expert in how the self-service solution operates. The champion user can help train new or existing engineers and assist them with ongoing support.

Self service offers a broad range of organizations a comprehensive and highly scalable solution to manage and maintain facilities, bookings and assets. By leveraging the latest Web and mobile technology, the software empowers end users and simplifies and streamlines the relationship between staff and the helpdesk, allowing for improved levels of job optimization and efficiency. It delivers complete transparency of performance to improve contractor relationships whilst driving KPI targets. Staff productivity is optimized, enabling a more proactive helpdesk, to deliver long-term administrative and operational cost savings, improve efficiency and drive business performance. FMJ

## REFERENCES

1. Symantec (2009), The Modern Service Desk. http://eval.symantec.com/mktginfo/enterprise/white_papers/b-the_modern_service_desk_WP_20042136.en-is.pdf

**Gary Watkins** is CEO of FM software expert the Service Works Group of Companies. Responsible for founding the organization, he is responsible for leading the SWG business and securing its consistent growth and overseas expansion.

Watkins has extensive IT and FM experience spanning more than 25 years and PPP experience totaling 10 years. His industry knowledge has led him onto a number of industry steering committees and panels, for which he provides guidance and analysis on IT/FM industry trends, business strategy, planning and developing commercial alliances.

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# CMMS: Realizing the Value

BY JOHN RIMER

A computerized maintenance management system (CMMS) can be a very valuable operations and business tool for facility managers. However, many, if not most, facility programs and their respective organizations are not realizing this value due to failed implementations, under-utilization or no CMMS installed at all. The intent of this article is to address common reasons for failed or struggling CMMS implementations, the value such a system can provide and recommendations for implementing or improving this robust facility management tool.

## Common reasons for failed systems

Empirically, there are many reasons for failed implementations or under-utilized CMMS installations. While this list could be extensive, the following are some of the most widely observed in the facility industry.

### *Wrong system for the job*

An all-too-common occurrence is the use of the IT department's work ticket system to manage facility-related work orders. While this allows the facility department to receive and process service requests, it does not typically maintain asset history, nor does it precipitate the collection of other crucial data needed to efficiently and effectively manage the department. Facility departments should seek to justify the purchase of a system that is catered to their business.

### *Budget to install, but not to implement*

While successful implementations can take months, many users measure in years — not due to the complexity or size of the installation; rather the extended periods are caused by the lack of resources. Thus, facility managers and their staff are left to input data, set up schedules, etc. in their limited spare time. This renders the CMMS useless and prevents it from returning value to the organization. The key to avoiding this pitfall is to adequately plan and budget for the internal and/or third-party personnel needed to meet the desired and agreed-upon timeline. The sooner the system is up and running, the sooner its value can be realized.

### *Insufficient planning and stakeholder buy in*

Another significant inhibitor to success is when a CMMS is purchased and installed without the appropriate due diligence up front clearly defining system requirements or soliciting stakeholder input. Thus, the facility department is saddled with a system that does not adequately meet its needs or those of its customers. Additionally, stakeholders and users may be resistant to using the system because they do not see the value. Such a situation can avoided through thorough analysis and stakeholder involvement.

### *Change paralysis*

A less common but noteworthy problem is that of extensive investment in a home-grown system or highly customized off-the-shelf product. Such situations can make revisions and upgrades very costly and undesirable; thus creating an environment of change paralysis. However, given the growing client demands and pressures on the facility industry to do more with less, it is necessary for facility managers to escape

this paralysis and make the needed changes, leveraging the advances in technology and processes to realize the efficiencies possible with such improvements. Organizations should compare the costs and capabilities of their existing system to those available in the marketplace and make an unbiased decision on which product warrants their continued investment.

### *Lack of knowledge and experience*

Lastly, lack of knowledge is the most common reason for failed or under-utilized CMMS installations. Most users have not been exposed to nor understand the value a CMMS can bring to their organization or how best to leverage its various capabilities to the betterment of the department. The solution to such shortcomings is to engage and learn from other facility professionals that have a robust CMMS and facility management program (such as through IFMA and your local chapter) or solicit the input of those who have experience in this arena, such as CMMS providers and consultants.

## The value of a CMMS

Facility managers are responsible for what is typically the second-largest asset and expense for most organizations — the buildings. Additionally, they have a direct impact on the productivity of the number one asset — its people. Yet, many facility managers operate without being properly equipped. One of the most, if not the most, important tool for a facility management program is a CMMS.

### *Nervous system of a facility organization*

The CMMS is the nervous system for a facility organization. It acts as the repository for building and equipment information and history, it assists in the management of a facility program and it is invaluable in assembling performance and budget data. Without a CMMS, most facility teams tend to be reactionary, which is very costly and unpredictable. A CMMS can equip the facility management team with the necessary data to drive value-added business decisions that resonate with the C-suite and communicate value to department managers.

### *Key functions of a CMMS*

The following are some of the key functions for which a CMMS can be utilized to better the facility management program. While this list is not exhaustive, it comprises at least the primary capabilities to look for in a CMMS.

- Maintain asset equipment information and history (including manuals, drawings, reports, etc.)
- Exhibit system hierarchy, location and relationships
- Store and manage maintenance standards, practices and procedures
- Schedule work orders and staff
- Submit and track service requests (for occupant/client use)
- Prioritize and dispatch work orders to staff and contractors
- Manage work orders through completion
- Document important work order information (labor, material, failure codes and notes)
- Provide closure to service requesters (automatically via email)
- Solicit customer feedback (through automated surveys)
- Schedule facility condition assessments
- Capital renewal planning and budgeting
- Key performance indicator (KPI) reporting, trends and analysis (including configurable dashboards)
- Extensive and flexible reporting

### *Tool for driving strategic business decisions*

While many of the key CMMS functions involve daily operations, the data collected will be utilized by facility managers at a more strategic level to discern program and team performance and to identify opportunities for improvement.

With scheduled maintenance in place and a solid history of equipment performance and failure costs, an accurate operations budget can be more readily generated from the CMMS. Using a zero-based budgeting approach, leveraging data gathered from the CMMS, facility managers can be better prepared to discuss and negotiate service level expectations and resource requirements. Additionally, a capital budget and respective three-, five- and 10-year plan can be extracted from the CMMS, allowing the FM team to put forward clear business justification for capital improvements and replacements.

Lastly, the tracking and reporting of facility program performance data can be and should be shared with management and stakeholders. The data can be used as part of the facility manager's marketing plan, promoting the value of the facility department to the entire organization.

## Successfully implementing or improving a CMMS

In order to realize the aforementioned benefits and avoid the pitfalls, one must be very strategic and methodical in the selection and use of a CMMS. This requires diligence to satisfactorily define stakeholder needs and system requirements. The following high-level steps can be taken to ensure successful implementation and use of a CMMS.

### *Identify stakeholders*

A CMMS will impact a variety of stakeholders; thus, it is necessary to identify the affected users and recipients of the system and its data to ensure a comprehensive needs analysis is developed. Stakeholders may include accounts payable, finance, middle and upper management, compliance and quality control, warehouse and inventory, contractors and service providers, building occupants, production personnel, clients and visitors and, of course, facility staff.

The extent of input solicited from stakeholders and the weight it holds in the decision-making process is dependent upon their interaction with the system and their need for data from it. This is an important political task for the facility manager, as these stakeholders could be important allies or obstacles in gaining funding approval and successful implementation. How well the facility manager handles this step will be crucial to the overall success.

### *Define processes*

As the saying goes, "a good CMMS cannot fix bad processes;" thus a critical evaluation of current facility-related processes should be conducted with stakeholders. Improving existing processes and defining new ones are important factors in developing system requirements and selection criteria.

### *Develop system requirementst*

Interviews should be held with identified stakeholders to discern their respective requirements and relative importance of such to their department, team, etc. Some examples may include:

- **Accounts payable –** Process of facility-related invoices and associate purchase orders and invoices with work orders and equipment, departments, etc.
- **Finance department –** Desired financial reports, including format and frequency
- **Human resources –** Time reporting and vacation/sick leave management
- **Quality control and compliance –** Work order approval routing
- Warehouse and inventory – Order and manage parts and inventory; charge materials to equipment, departments, etc.
- **Building occupants –** Service request submission and status, customer surveys, facility department communications and important initiatives
- **Scheduler –** Review and triage service requests and work orders; prioritize, dispatch and close work orders; manage, coordinate and communicate service and maintenance; communicate with facility staff, contractors and service providers
- **Facility engineers –** Assigned work orders, backlog, equipment history and information, work order completion and data requirements, interface with inventory, purchasing, etc.
- **Contractors/service providers –** Assigned work orders, complete work orders, provide required data and documentation
- **Facility management –** Desired KPIs and dashboards; budgeting reports and analysis tools

### *Create assessment matrix*

Once system requirements have been identified, incorporate them into an assessment matrix. In the matrix, each requirement is listed separately with a weight factor assigned; typically the sum of the weighted factors equals 100 percent. Then a grading or evaluation scale must developed, such as "0" – does not meet requirements, "1" – could meet requirements with customization, "2" – nearly meets requirements, "3" – meets requirements and "4" – exceeds requirements. It is assumed that cost will be a factor in the decision process; however, it should not be the key deciding factor, as what may be saved in the initial price could be starkly overshadowed by the efficiencies gained with more expensive systems. An organization may want to consider initially removing the cost component from the selection criteria; then reveal the prices for top contenders once the requirement evaluation is complete.

### *Identify and evaluate qualifying vendors*

Use system requirements to identify and qualify potential CMMS products. Once qualifying products are identified and further information gathered, an initial evaluation can be performed to further narrow the list. Stakeholders or stakeholder representatives should be invited to participate in the evaluation process. Highest scoring candidates should be requested to demonstrate how their system meets the organization's requirements and processes. The CMMS should be scrutinized to determine if customizations are necessary to satisfy the needs, as customizations can significantly increase the cost of the system over its lifetime. Stakeholders should participate in this final review process and selection of the CMMS.

### *Plan for successful implementation*

Develop a budget that includes the cost to purchase and set up the product, train staff and operate the system. Make sure to account for recurring costs, including software maintenance agreements and licensing fees. Additionally, the facility department's operations budget should include the staff necessary to administer and maintain the CMMS in accordance with the prescribed processes, such as a scheduler, dispatcher and someone to input and update equipment information and maintenance schedules.

Lastly, put together an implementation schedule that is realistic and manageable given the approved budget. The schedule should be communicated and agreed to by management and stakeholders. In establishing the schedule, be careful to consider which modules and data should be implemented first and their dependencies. Then celebrate the accomplishment of milestones and communicate their value to the entire organization.

A CMMS can and should be a valuable tool to the facility department and the overall organization. However, without the appropriate due diligence up front and the needed ongoing support, a great CMMS software can quickly become a despised thorn in the side. Thus, be wise in the selection, involve stakeholders and solicit help and insight from experienced consultants and fellow facility professionals. **FMJ**

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# LEVERAGING TECHNOLOGY *for Effective Facility Management*

BY MATT GREEN

According to the International Energy Agency, buildings consume approximately 40 percent of the world's energy[1]. While this might seem a staggering figure to some, it should come as no surprise to those who own, operate and pay the energy bills for today's buildings.

Tasked with reducing consumption while maintaining a healthy and productive environment, management and automation systems are now top of mind for facility owners and managers. Over the past decade, the building management industry as a whole has taken positive steps in improving energy efficiency, but there is still a long way to go.

As the era of the "Internet of Things" emerges and enormous amounts of data are being generated by newer building components, organizations are struggling to turn that data into meaningful action that will improve operations. New technologies, coupled with the adoption of long-standing open protocols, are revolutionizing how buildings operate, as well as how occupants and facility managers interact with their buildings. This is creating opportunities to resolve some of the challenges associated with the big data generated by the Internet of Things.

## Using open protocols as an advantage

Open protocols indicate that a piece of equipment or a system adheres to industry-recognized communication standards. These common "languages" allow equipment and systems from different manufacturers to communicate and work together.

While open protocols provide many advantages, there are also some limitations. In order for the components to communicate with each other, they have historically had to "speak" the same protocol. For example, if an in-place HVAC system has equipment that uses BACnet, installing new "best-in-class" equipment that uses LonWorks as its protocol would not be possible because it's not compatible. As a result, building owners and managers have tended to implement different systems over the years that run different protocols, thereby complicating the management of building energy usage as a whole.

## Integration as a strategy for smarter building management

One of the highest impact strategies to improve a building's operations is integration of previously disparate systems. By implementing an integrated building management system (BMS) that acts as a universal translator, all the components and systems within a building, regardless of what protocol they natively speak, can be monitored, managed and controlled from a centralized point. Information from outside the building, such as weather data and utility costs, can also be integrated via Web services. This much more efficient process ensures the optimization of critical building functions, including fire safety, HVAC, lighting and energy metering.

Integration of systems is also changing how stakeholders are managing their buildings. Building managers now have access to real-time data from across their buildings'

systems. This not only greatly reduces the time it takes to diagnose and fix issues, this centralized integration also delivers new visibility into how a building's systems are working together, providing opportunities to improve and optimize overall operations. It is also much easier to see trends that indicate best practices or areas for improvement — something that would be impossible if all systems are managed individually.

## Case studies

For example, the energy-conscious Davis School District in Davis County, Utah, USA wanted to implement a more robust energy management system that made the most of legacy systems while incorporating new technology to improve results. With 59 elementary schools, 16 junior high schools, 340 portable classrooms and 11 high schools making up more than 10 million square feet, the district wasn't able to replace all of its systems due to time and budget constraints. As a result, the Davis School District selected a solution that brought together all of the district's legacy and third-party open protocol systems onto a single user-friendly system in just three weeks. The solution enabled the district to have a holistic view of its buildings for the first time, allowing it to apply focus on underperforming facilities to maximize energy savings.

With the solution, the facility managers within the Davis School District now have access to a customized dashboard of real-time data for the building portfolio. They can access this data at a workstation in the building, via a standard Web browser or even a mobile application. The graphic interface provides actionable information, trend visualizations and one-click reports, ensuring that all of the buildings are running at maximum efficiency.

The Davis School District is already leveraging the technology to improve processes and reduce energy consumption and spend on unnecessary operational expenditures. For example, in the summer months, air conditioning was previously running every day in the main offices across the district so the space would be cool in case staff came in. With the new system, staff can log in to a portal to switch on the AC before arriving at their office and shut it off when they leave, so the air conditioning is only running when needed.

Another example is VOX Telecom, a leading telecommunication company providing solutions in data, Internet, telephone, visual communications and managed and cloud services in Johannesburg, South Africa. The company was seeking to optimize its energy usage, but was grappling with several disparate systems, limited access to power metering data and a less-than-optimal tariff structure.

Through a phased approach, VOX Telecom implemented a fully integrated solution. In the first phase, the company installed power meters to capture data essential for decision making, and software that provided core metering data, detailed reports of power quality, consumption patterns and bill verification. After this phase was

CUSTOMIZATION AND PERSONALIZATION ALSO PLAY AN IMPORTANT ROLE IN THE SAFETY AND SECURITY OF THE BUILDING.

completed, VOX Telecom was able to calculate their data center power usage effectiveness, which compares a data center's usage to industry standards. This information allowed them to prioritize which data centers to focus on updating first.

The final phase of the project was installing a solution that ties together all of the disparate systems and provides a single, easy-to-use interface that monitors, manages and controls the entire enterprise. The result for VOX Telecom was significantly reduced energy usage and a better tariff structure. The company is currently planning to roll out the system to other regional offices.

## Scalability for the future

A scalable solution enables building owners and managers to gradually deploy new technologies to ensure the systems are delivering on their promise of a more efficient building. This agile, iterative approach lets building managers work within today's tight budgets while demonstrating a return on investment to validate continued investment. Choosing a technology partner that offers an end-to-end strategy is optimal for long-term success. This approach can start with something as simple as adding new wireless room controllers to increase occupant satisfaction while reducing energy usage. Power meters can be added to gather information on actual usage and an integrated BMS will pull in all of the data from the old and new systems in the building, and provide an overview of the entire building along with strategies on how to optimize it. The system can then be deployed across the entire enterprise and eventually managed using advanced cloud technology.

## Customization and personalization

A new trend in building management and operations increasingly focuses on the end-user to provide a more personalized experience. Every building management scenario is different, and the most impactful building management models occur when the organization can work the way it wants to, rather than conform to a "one-size-fits-all" approach.

Choosing a BMS that can be customized to the building type (hospital, school or office space), and personalized to the user type (CEO, maintenance technician or occupant) ensures the building is being optimized for every level of functionality. For example, a C-level hospital executive may only require a high-level overview of hospital energy use to present to stakeholders, while a facility manager at a data center needs to see the energy usage of every chiller while having the ability to control the chiller system. In addition, occupants in multiple types of applications such as schools and multi-tenant office buildings can become engaged in saving energy by seeing a visualization of overall energy consumption in common areas.

As part of its new solution, the Davis School District's BMS provides each individual school with its own view of energy use, allowing building stakeholders to view information about their specific building's energy use. In parallel, district facility managers have a view that enables them to manage energy across all of the school system's facilities. Principals can access the AC controls for their office and maintenance staff only see alarms for equipment they maintain. Power users of the system can even save different versions of the interface to help them quickly accomplish their varied responsibilities. The school is even using the BMS as an educational tool by providing a dashboard of energy usage in common spaces and access to certain metrics to teachers so they can incorporate building energy use into their lessons.

Aside from these scenarios, it is important to remember that customization and personalization also play an important role in the safety and security of the building. The BMS controls critical building systems and can literally have life and death consequences if systems fail. The BMS needs to ensure that only the right people can access and control systems and keep a detailed audit of who did what and when.

The move toward open protocols is creating an opportunity to integrate disparate building systems. New technologies can be installed that optimize a building's operations while improving the use of resources without needing to replace existing systems. With a scalable approach to upgrading, adding new technologies gradually allows building managers to demonstrate the ROI of system improvements as they scale up to a fully integrated BMS. These technologies are equipping FMs to better understand and improve operations for the buildings they manage. FMJ

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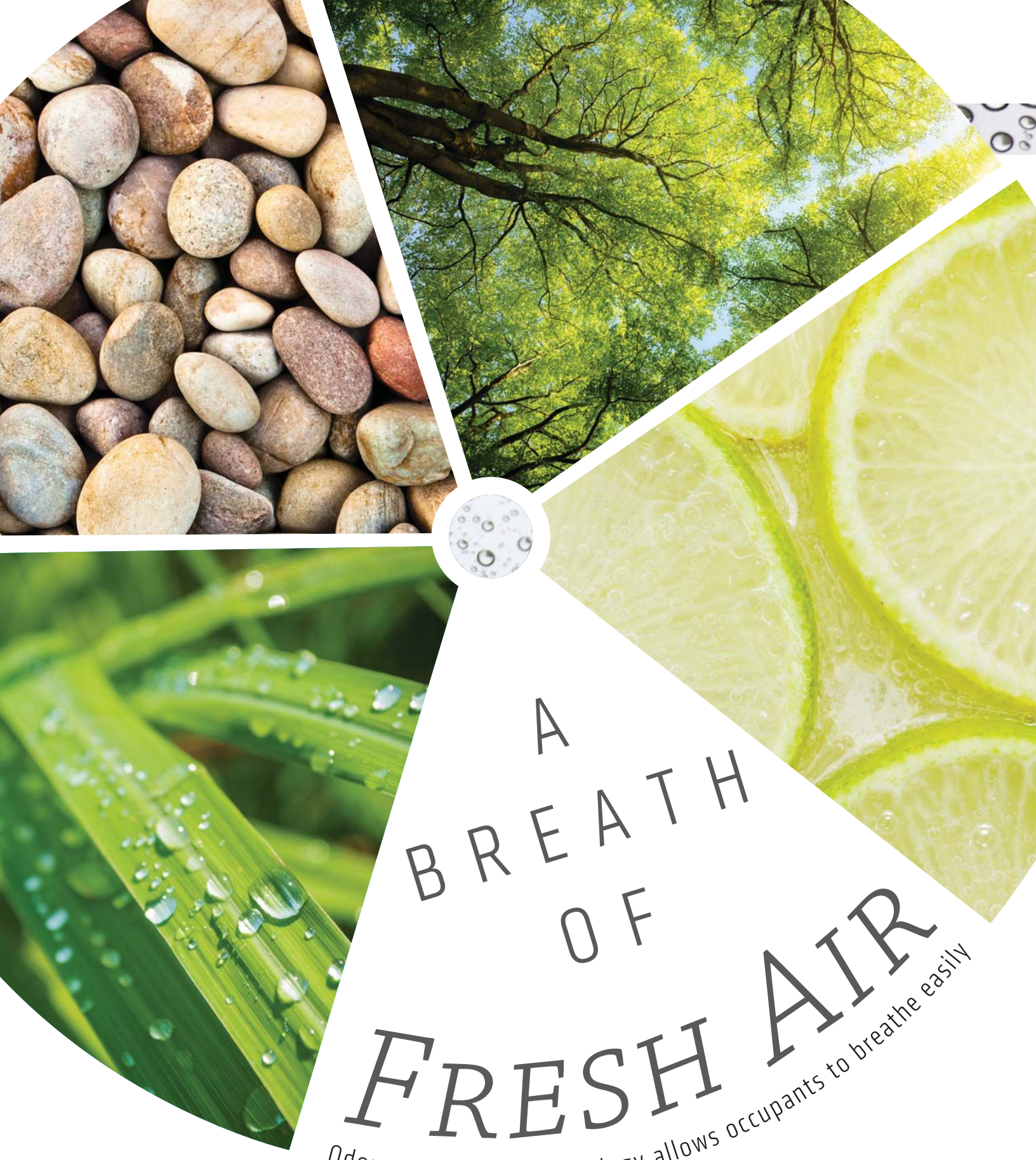

# A BREATH OF FRESH AIR

Odor remediation technology allows occupants to breathe easily

BY KELLY WALOWSKI

Facility managers today are required to focus on many things that contribute to the bottom line. This includes not only reducing facility costs, but also improving the image of the facilities they manage. Enter any building and you will immediately experience auditory, visual and olfactory sensations. While most buildings are now tobacco free, there is a plethora of other opportunities for malodorous issues to arise, including smells from food courts, stale air, sewage or even exhaust or gasoline odors from attached parking garages. The U.S. Environmental Protection Agency reports that indoor air quality can often be five times worse than outdoor air, with odors from smoke, perspiration and fungi.

*Implementing effective odor remediation should be part of every facility manager's plan for an enhanced overall patron and tenant experience.*

Continuously maintaining superior air quality in buildings is an ongoing campaign; therefore implementing effective odor remediation should be part of every facility manager's plan for an enhanced overall patron and tenant experience. Along with different types of chemicals and cleaners, there are applications traditionally designed to mask odors, such as aerosol "spritzers" typically emitted from wall-mounted atomizers in facilities of all types. Often heavily perfumed, their purpose is to overlay an odor already present, which can make an existing odor problem more evident. Cleaning products that combine enzymes offer another type of odor reduction treatment. While using enzymes can help in destroying the bacteria and reducing odor, it can take several days to complete the process and for the odor to dissipate.

## Cutting-edge technology advances odor remediation

Fortunately, it is no longer necessary to saturate a space with heavy concentrations of scent and environmentally unfriendly volatile organic compounds (VOCs) in order to create a pleasing scent ambience and deal with problem odors. Technology has evolved to provide an approach to odor remediation that involves the identification of the malodor, formulation of a neutralizer, delivery of the neutralizer into the space to be treated and concentration control of the neutralizer in the air. You can implement a less-is-more strategy by knowing the odor, using a targeted neutralizer, conducting a careful aero-engineering analysis of the space and utilizing a computer-controlled appliance that converts the air treatment agent into non-residue nano-droplets without the use of harmful VOCs.

Nano-droplets behave like a dry vapor. They are uniform, leave no deposits and require less liquid than aerosols. A nano-droplet is 1/125,000 of the weight of an aerosol droplet, a characteristic which enables the scent to hang in the air for up to 16 hours. Nano-droplet generation technology is safe for use in HVAC systems and is fully programmable. The dispenser conforms to relevant safety standards and, typically, one unit replaces as many as 22 conventional aerosol dispensers.

Cartridges filled with the nano-droplets are inserted into a unit attached to an HVAC system. The liquid is then nebulized within the unit, which converts the liquid into vaporized air molecules. The vapor travels through the ductwork of the HVAC system when the air conditioning or heating system turns on. When the air pushed through the ducts is being supplied through the air handler, the nano-droplets join the airflow and move through the ducts to be dispersed, leaving no residue in the HVAC system or on surfaces.

Nano-droplets are lighter and remain in the air longer than other solutions, therefore significantly less fragrance is needed to provide a cost-effective odor remediation solution and does not leave wet deposits on any surfaces. The nano-droplet technology has been rigorously tested to pass U.S. Occupational Safety and Health Administration and industry standards, making it a safe, effective alternative to atomizers and viable for any type of building whether it caters to adults or children. Nano-droplet technology may even help a building achieve points toward LEED certification due to its low VOC content and recyclable consumables (cartridges).


## Case study: Odor remediation tackles a resident skunk

Let's look at an example of the effectiveness of implementing this type of odor remediation. A tenant at a commercial building that houses many government agencies and is maintained by a property management company complained about a lingering, disagreeable odor that smelled like burning rubber. The facility manager deduced that one of the HVAC units might have thrown a belt, while the tenant clearly thought it was a skunk.

The facility manager initially dismissed the notion that the odor was skunk induced. That changed when she came in the next morning and found that the odor had grown even more pungent and more clearly identifiable as skunk. The manager went to the local pet supply store and purchased a bottle of odor remover. When she returned to the building, she sniffed out the skunk smell and traced it to an electrical outlet in the office wall.

*Nano-droplet generation technology is safe for use in HVAC systems and is fully programmable.*

She then realized the skunk had sprayed inside the wall, which required removing eight feet of sheetrock, all of the insulation and the carpet. The concrete was then sprayed heavily with the odor remover. Uncovering a hole underneath the ductwork coming into the building, traps were set. The two skunks were caught in one trap, albeit too late. Unfortunately, now the entire building smelled of freshly trapped skunks.

With nothing else working to solve the odor problem, the manager decided after much research to try the nano-droplet technology, selecting a lemongrass basil scent to be circulated through the building's HVAC/duct work system. Within just 30 minutes, the building started to smell better. In about four hours, the entire office building smelled significantly better. In just five days, the system had completely removed the odor.

## Case study: Not everyone loves popcorn

In another example, a commercial building that housed a mix of retail and hotel tenants also contained a movie theater. The popcorn odor from the theater was so strong that it permeated beyond the area and throughout the entire facility. Several high-end furniture retailers complained to the facility manager that their customers were hesitant to purchase furnishings, thinking the popcorn odor would transfer into the furniture they wanted to buy. While the popcorn odor wouldn't actually transfer into the furniture, the psychological connection that customers were making while standing in the

furniture store smelling popcorn deterred them from purchasing.

The facility manager needed a solution and chose nano-droplet technology for its odor remediation, selecting an iced pina colada scent to be diffused throughout the building's HVAC system. The popcorn odor vanished and the complaints stopped.

## Achieving results

While skunks and popcorn may not be everyday concerns for the average FM, the stench from a loading dock might be. Consider where the service elevators are in proximity to the loading dock. Odor from the docks may travel straight up the elevators and onto tenant floors as those service doors open. Nano-droplet technology is an easy-to-implement, affordable solution that prevents a host of negative connotations associated with building complexes and public facilities.

Odor problems in a business may cause embarrassment, discomfort and health concerns. Scientific studies have shown that pleasing aromas added to indoor air can significantly raise productivity, morale and even reduce stress among building occupants. The best results require a uniform distribution into the air utilizing a system that is capable of maintaining correct dosage and when added via ventilation or air conditioning systems.

The technology enables facility managers to take a safe and sustainable approach to odor remediation to enhance an environment. Facilities rely on ambient scenting for a wide spectrum of solutions. Citrus or floral scents can bring a fresh feeling of cleanliness to the space, while the discreet scent of peppermint, gingerbread or pine can bring the holidays to your lobby.

No facility manager wants to leave a negative impression on tenants or visitors. Implementing an ongoing scenting plan is well worth the results — happy tenants who renew their leases and customers who leave with a positive impression. **FMJ**

**Kelly Walowski** is an ambient designer with Ambius, the global interior landscaping leader. Ambius offers a full spectrum of services to enhance the interior space for the hospitality, health care, retail and commercial industries with services including ambient scenting, interior landscaping, holiday décor, decorative wall art and fresh fruit and flower deliveries to businesses in 18 countries. For more information, visit the Ambius website at www.ambius.com.

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## The Importance of Coalition Building in Government Affairs

With just under four months to go before this year's U.S. Advocacy Day and Public Policy Forum, the artic temperatures that gripped Washington, D.C. and most of the U.S. for the winter months have given way to spring. Despite this welcome change there has been no thaw in the bitter partisanship that has stymied compromise in Washington for the past several years and those both in Congress and the private sector continue to look to common sense areas where compromise is possible. Two of the areas where progress is not only possible but needed, both in the U.S. and abroad, are energy efficiency and reducing waste; two areas where IFMA and expanded industry-based coalitions can play a role.

As you may recall, IFMA's government affairs program started more than 10 years ago to focus on building security and insurance issues in the United States following the September 11 terrorist attacks. From those humble beginnings our program has grown considerably in recent years — engaging in successful advocacy efforts, changing the focus of debate in Washington, meeting with decision makers and stakeholder groups in the E.U., conducting international government leaders sessions focused on FM and developing a strategy to support IFMA's growing membership around the world.

Now more than ever, decisions made by elected officials and the industry groups that inform them are affecting the built environment; mandates for energy efficiency, FM training, building access, security, financial incentives, workplace safety and building codes all have increasing impact on the business of FM. In this environment it is critical that the voice of the FM, who in many cases will ultimately be tasked with implementing these policies, be part of their development. These decisions affect not only FM, but a broad cross section of the global economy and the professional associations that represent them. In this environment, the value of working together in large coalitions is increasingly clear.

In recent years, in both the U.S. and Europe, IFMA has become more actively engaged in coalition efforts. In the U.S. IFMA, building on the framework that led to passage of the Federal Buildings Personnel Training Act, has been at the forefront of an effort to develop the Policy Committee of the High Performance Buildings Congressional Caucus. This newly created entity representing more than 30 leading organizations in the building community is dedicated to providing industry-based recommendations and research to Congress and the administration. It is our hope that the ability to make recommendations on behalf of the building community will help cut through the legislative log jam and create common sense solutions to real world problems.

Similarly, in Europe, this year's government affairs session at the European Facility Management Conference (www.efmc-conference.com) will be dedicated to building a similar FM-specific coalition among European FM organizations, product and service providers. The goal will be to showcase the broad impact of FM and the built environment, collaborate on policy development and work together on a multinational level to identify solutions to common challenges. It is our hope that the strong FM-centric coalition can play a major role in the current debate in Europe on energy efficiency, water use and workforce development.

To learn more about IFMA's public policy program and our coalition efforts, please consider attending or participating in one of our sessions at Facility Fusion, the government affairs session at EFMC or our annual Advocacy Day and Public Policy Forum being held in Washington, D.C. July 23-25, 2014, an upcoming government affairs webinar or reaching out to our team at jjohnson@ifma.org. **FMJ**


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# MODELING & OPTIMIZATION IN STRATEGIC SPACE MANAGEMENT

BY MICHAEL MAY

Cost reduction in facility management is a hot topic. While energy consumption is a major concern, it is often overlooked that much greater potential lies in the efficient use of available space. Space allocation is tedious work and a great challenge for facility managers as it entails a considerable economic impact on the entire organization. Space allocation is not only an operational task but also an issue of strategic planning. Currently, this endeavor is widely approached manually using CAD functionality and spreadsheets, which deliver questionable results due to the tremendous complexity involved in the task.

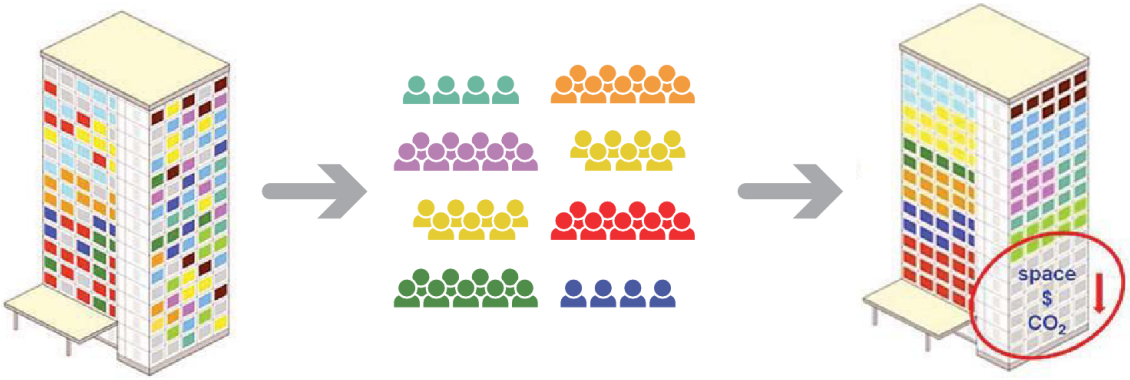
The inherent mathematical problem in space allocation is similar to the quadratic assignment problem (QAP), known as one of the most intricate discrete mathematical problems. To date, there are no algorithms that solve this kind of problem in an efficient and optimal manner; hence it is necessary to adopt heuristic approaches.

It is a great challenge to develop new technologies that assist in this complex optimization process, taking into account that much of the information needed is already available in CAFM/IWMS systems.

## Approach

In a joint research effort the University of Applied Sciences HTW Berlin and the ReCoTech GmbH has developed new mathematical models and procedures that allow automated space optimization in large real estate portfolios. The procedure assigns departments and people to available spatial resources (in one or more buildings) while taking into account preconditions like shortest distances and adjacencies of organizational units. The software enables the user to generate different variants of space allocations and evaluates their quality based on criteria such as reduction of cost, time, number of necessary reallocations and/or communication traffic. In this way, available valuable (unused and/or unnecessary) space is detected in one site and space is used more efficiently in another site.

With this novel technology, cost reductions can be achieved in a comprehensible and objective way. The approach is independent of any specific

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Workspace Utilization and Allocation Benchmark

**FIGURE 1:** *Strategic space management with substantial optimization potential.*

IT system such as CAFM, IWMS, GIS, ERP and uses standard data formats. The economic benefits of space reduction (which range up to 30 percent) are tremendous and often unexpected by users.

SPACE ALLOCATION IS NOT ONLY AN OPERATIONAL TASK BUT ALSO AN ISSUE OF STRATEGIC PLANNING.

## Space utilization optimization

Space utilization is related to strategic business goals. An automated optimization must consider:

- Available spatial structure
- Spatial needs and constraints
- Communication needs within the organization

Resulting tasks are:

- Allocation schemes for new buildings and occupancies
- Space concentration with the goal of vacating unnecessary areas for subsequent utilization by selling, leasing these spaces, etc.
- Space concentration with the goal of providing space for organizational units to move in from other locations

Figure 1 illustrates the space optimization tasks showing a potential reduction in necessary space, financial resources and carbon footprint.

Today allocation schemes are accomplished only manually or with the help of traditional IT tools such as CAD or CAFM/IWMS. An automated generation of allocation variants or the simulation of different scenarios does not exist. Optimized space planning for complete sites is not possible at all.

Investigations have revealed that with the exception of a GIS-based approach by NASA Langley Research Center, an applicable IT solution for automated space utilization optimization does not exist[1].

## Huge complexity

The allocation question under consideration belongs to the class of layout/placement/location problems. In general, it is about assigning a certain number of objects in an optimal way to a number of locations/facilities, considering certain constraints and relations between the objects to be placed.

The mathematical background for the creation of optimal allocations is the quadratic assignment problem (QAP)[1]. The complexity of this problem results from the combined multitude of possibilities to assign organizational units to spatial resources. The allocation of 10 organizational units (e.g., employees, teams, departments) to 10 spatial units (e.g. areas/rooms, space groups) already results in 10! = 3,628,800 allocation possibilities. In reality, exact algorithms that basically have to enumerate the variants already fail due to excessive computing time when the problem size exceeds 15 to 20. With 70 organizational units, which represent a medium problem size in real life, the number of the possibilities rises to an incredible $10^{100}$.

The QAP is a simplified version of the space allocation problem under consideration. In addition, there are numerous constraints defined by the user that must be formalized likewise.

## Solution

Consequently, a heuristic approach has been developed based on the divide-and-conquer paradigm. The approach essentially consists of controlling the size problem by grouping suitable rooms into room groups/blocks on the one hand and employees into teams/clusters on the other.

This methodology relies on intelligent users to utilize pattern

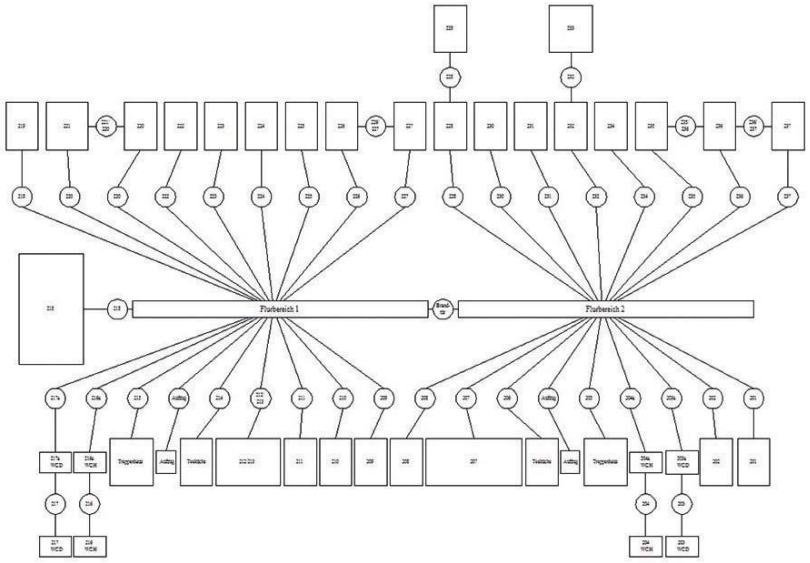


**FIGURE 2:** *Section of a structural model of a building as a space graph.*

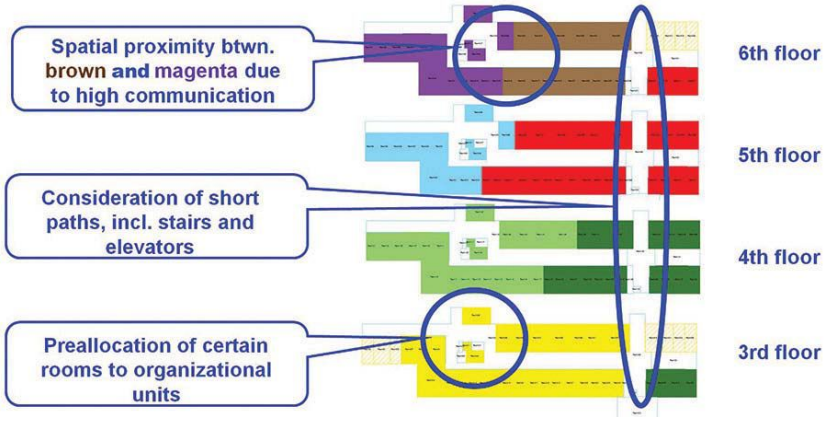



**FIGURE 3:** *Computer-generated allocation variant.*

recognition and strategic thinking. Facility managers are actively integrated into the process and are given the possibility of dividing the building(s) into spatial units and the organizational structure into teams/clusters. Furthermore, the FM is allowed to assess the results after each iteration and to influence the ongoing calculation. This method enables a stepwise restriction of the problem size and thus the result is "optimally" tailored to the specific task.

An important challenge concerning automated allocation planning and the related space management is the transformation of a CAD drawing or building information model (BIM) into a formal description, on which the mathematical optimization procedures can run. A suitable way to display the spatial structure of a building is through use of space graphs, which model the relative position and accessibility of areas[1], even throughout the borders of floors and buildings. Figure 2 shows a space graph based on a sample floor.

Space graphs can be generated more or less automatically from CAD drawings; a good method is a semi-automatic approach based on pattern recognition with some interactive intervention. At the same time, the room sizes (areas) needed for the optimization are derived. Furthermore, the space use for each room is read from the drawings or specified otherwise. With the help of shortest-path algorithms, it is now possible to determine the real distances between two locations.

The communication intensities/adjacencies that are supposed to result in spatial proximity of the respective units/teams are modeled by an adjacency matrix, where higher numbers indicate stronger communication needs.

## Results

The methodology developed is able to generate very quickly alternative allocation variants according to given optimization criteria, like space requirements and proximity between certain organizational units. The task of the user is only to determine his or her "best" variant. An efficient visualization, KPIs and a reporting tool support the user in decision making.

Figure 3 shows an automatically generated allocation variant with consideration of intercommunication between individual teams of the organization in a graphical form. The same colors indicate groups/teams, which should be accommodated close to each other. The distribution of a team (e.g., over two floors) can be more favorable than assigning the whole team to one widespread floor (red). However, by increasing the (virtual) distances (weights) related to stairs and/or elevators these teams can be forced to be placed on the same floor. The spatial proximity of such groups can be forced by specifying their communication intensities. Furthermore, the preallocation of certain persons/teams to specific rooms is possible.

Compared to the minimum conceivable (theoretical) space requirement of 100 percent (sum total of all spaces needed without considering available room sizes), the automatically generated variant needs

# OPTIMIZATION PROCEDURES PRODUCE COMPREHENSIBLE ALLOCATION VARIANTS IN A SHORT TIME.

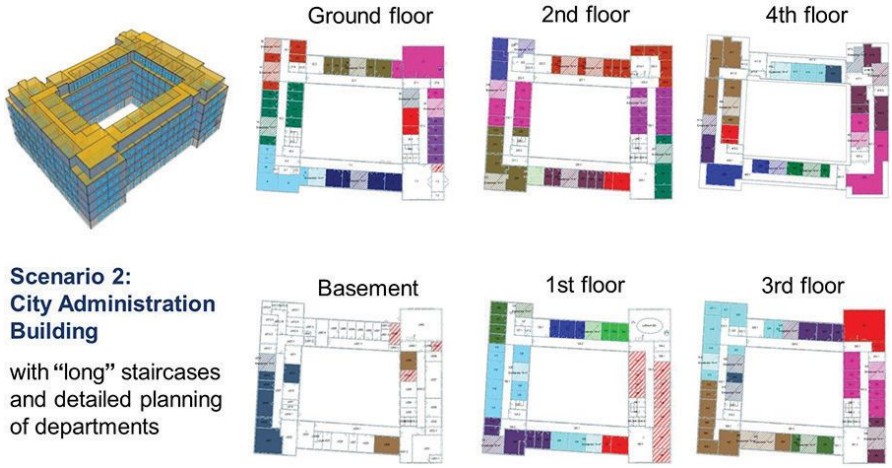



**FIGURE 4:** *Computer-generated allocation with detailed planning of departments.*

only 1.76 percent more space while all the requirements (constraints) imposed are fulfilled.

Such requirements can be:

- Preallocation of rooms
- Specific space requirements (e.g. single room)
- Definition of projected space (buffer space)

The user can control the procedure by weighted criteria, such as:

- Occupancy rate
- Compactness
- Communication relations
- Sample projects
- Municipal administration building

As part of a major restructuring effort, the authorities of a German city needed to evaluate the pros and cons of two main scenarios concerning the future use of Building A as well as the investigation of two refurbishment options and

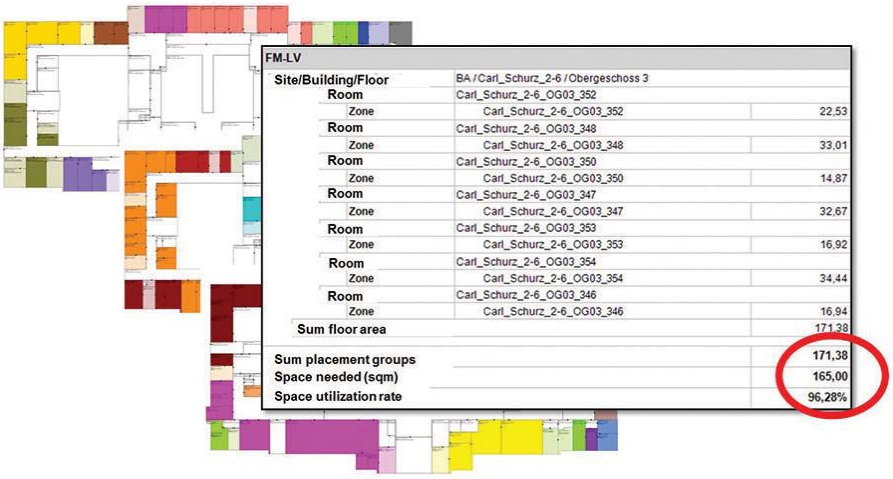



**FIGURE 5:** *Display of allocation results with a space utilization rate of 96.28 percent.*

their effect on each. The following question had to be solved: How many (and which) departments fit into Building A if 1) the archives are refurbished as offices and 2) the attic is refurbished and used as office space?

Two planning scenarios were considered: Exclusive use as a city administration building versus use as a citizens' services center. As a result of the optimization (figure 4) more than 50 people were added to the office building. This also meant a reduction of planned investment for a new building by US$3.9 million.

## Administrative District of Berlin-Spandau

Spandau is one of the 12 districts of Berlin with about 223,000 inhabitants and comparable to a medium-sized city. There are about 1,590 employees working at the district's administration using 12 buildings with about 720,000 square feet of GFA (gross floor area).

The project was started due to a structural budget deficit and the pressure to reduce cost. The administration was aware of inefficient space use, which resulted in the conclusion not to reduce the service for the citizens but to make more efficient use of the available space. The objective and challenge was to empty one or two buildings in order to reduce space of at least 53,000 square feet GFA without reducing the individual space requirements and comfort of the employees.

The project mission was to:

- Prepare and review space demand and supply data,
- Display current occupation and space utilization,
- Define potentials for optimization and
- Deliver optimized allocation plans, considering user needs and specifications.

The project was run in a number of steps starting with an initial workshop and ending with a final decision by the district authority on the abandonment of two buildings. First the space requirements of the different user groups were determined, including specific needs such as single room assignment, preallocation and buffer spaces. The results of the computation are presented in different allocation variants including graphics, lists and reports (figure 5).

The benefits for the district Berlin-Spandau sum up as follows:

- Vacating of two buildings (totaling 58,642 square feet)
- Savings of about € 650,000 p.a.
- Savings of an otherwise necessary investment into infrastructure of € 350,000
- Reduction of CO2 emissions by 261,000 kilograms p.a.
- Updated space requirements and standards
- Transparency of available space

Costs of € 100,000 occurred due to the necessary moves, however the total benefit was still very impressive.

Other projects have been and are being conducted in the industrial, health and public sector. Some of the cases were run as projects, in some cases a software license was acquired and others started with a pilot project followed by purchasing a license.

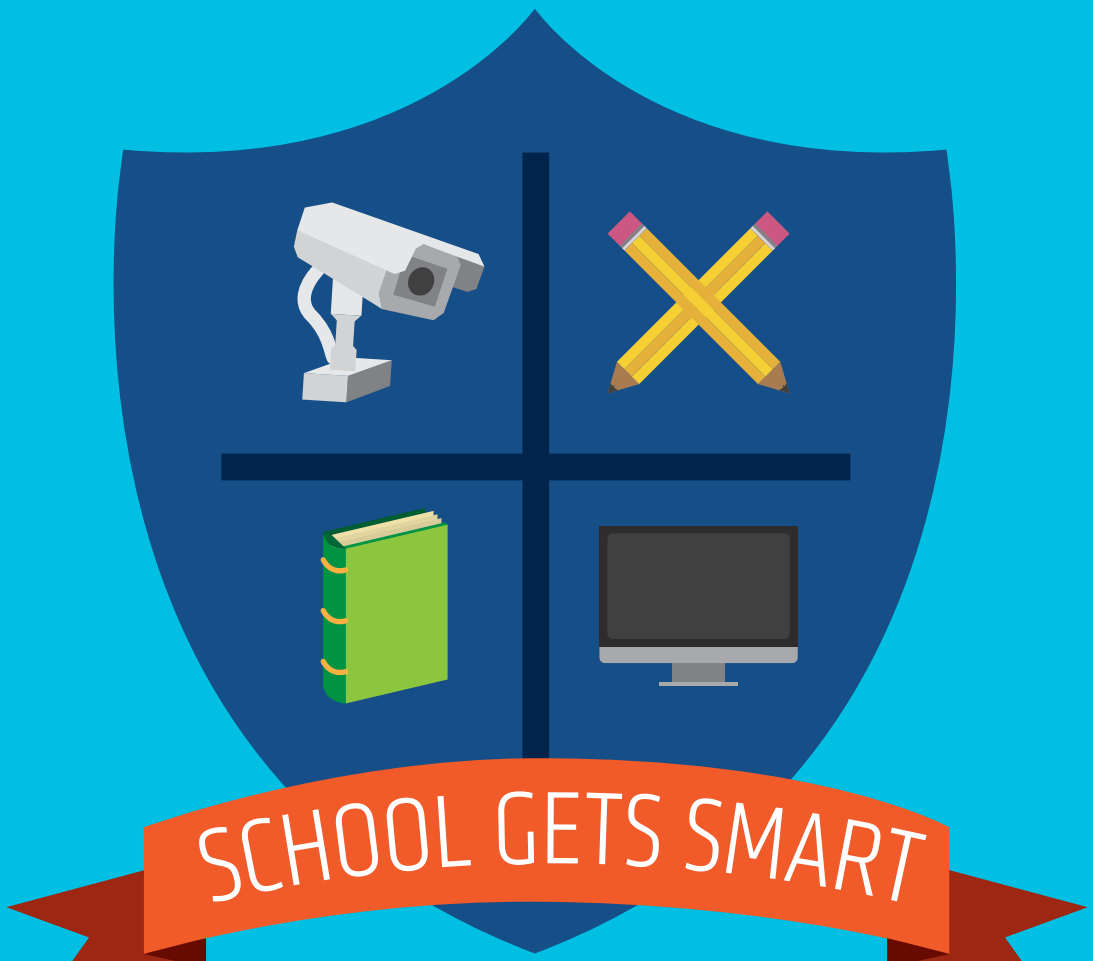
The optimization procedure produces comprehensible allocation variants in a short time. The results are provided in textual (list) format but can also be visualized based on the initial CAD data. In this way the results can easily be understood by the user and could be modified if desired. Furthermore, they can be handed over to CAFM/IWMS systems to be used in subsequent processes, such as detailed move planning. **FMJ**

## REFERENCE

1. May, M.; Williams, G. (Eds.): The Facility Manager's Guide to Information Technology – An International Collaboration. International Facility Management Association, Houston, 2012.

**Michael May,** Ph.D. has been a professor of computer sciences and facility management at the University of Applied Sciences (HTW) Berlin since 1994. He is a board member of the German Facility Management Association (GEFMA) and is head of GEFMA's IT (CAFM) work group.

May represents GEFMA at the international level and is a member of IFMA. His current research and lecturing is in the field of IT and FM.



# SCHOOL GETS SMART

## *Security approach updated with IP-based surveillance*

BY JOEL STAPLES

The Metropolitan School District of Wayne Township — the largest metropolitan school district in Indianapolis, Ind., USA — recently underwent a campus-wide video surveillance system upgrade for its network of 17 facilities.

At the time of the original installation, the school district, which educates more than 15,000 students, had one of the largest and most advanced security systems in the Midwest. When the school district underwent phased renovations from 2000-2009, the video surveillance systems for the facilities were built into the construction costs, and analog cameras were installed until 2007 when the school district began implementing IP cameras. While the system, which included more than 1,000 analog cameras, was state-of-the-art at one time, it was causing maintenance to become time consuming and costly. The school district needed to recalibrate its budget to find a more cost-effective solution.

In the past, each facility within a school district needed its own servers and software to manage its physical security solutions. This led to redundant technology investments, and in some cases uneven security across schools.

### Transitioning from analog to IP-based surveillance

The surveillance industry continues to transition from analog to digital, which

## THE SCHOOL DISTRICT NEEDED TO RECALIBRATE ITS BUDGET TO FIND A MORE COST-EFFECTIVE SOLUTION.

takes place on two fronts: how the images are captured and how they are stored. A full understanding of these two technologies empowers facility management and security professionals to understand the options available when purchasing or designing video surveillance.

With today's affordable high megapixel cameras, video surveillance can be utilized far beyond basic security, including tracking people flow and efficient use of facilities such as sports fields, gymnasiums, auditoriums and conference rooms. Motion-activated cameras can be used as part of an intrusion detection system by activating alarms and lights as alerts. They can also be employed as crowd control devices, safety support in traffic lane areas and on busses to control bullying and unsafe passenger and/or driver activities.

### An end-to-end upgrade

The Metropolitan School District of Wayne Township met with its consultant to devise the best solution. The school district needed a system that was highly scalable and provided rapid access to the best evidence and reduced investigation times. The new system also needed to be user friendly to save time and training resources.

The chosen system was a powerful, award-winning HD video solution that would provide a much more effective surveillance system and significantly reduce maintenance and storage costs. In fact, the new system allows for an average of 128 cameras to run on one server, whereas the school district's previous platform required one server for every 64 cameras.

The plan involved upgrading the school district's existing video management software (VMS) to the new easy-to-use, end-to-end IP-based system, which allowed the school district to reuse its existing cameras so there was no loss to its previous equipment investment.

The project began by converting nearly 800 existing cameras to the new control center network video management software. The state-of-the-art system includes a modern interface, increased functionality and search features to improve the performance of its existing cameras. This allowed the school district to leverage its initial investment of the cameras and reduce the cost of deployment. The conversion was a smooth transition that left very little downtime, allowing the school district to maintain its surveillance while converting to the new software.

With the end-to-end surveillance software in place, Wayne Township could start taking advantage of the software's flexible applications and capabilities. The new platform was designed with the future in mind and allows the school district to incorporate modern technologies as its security needs grow. Wayne Township opted to replace 20 of the existing cameras and add an additional nine high-definition megapixel (MP) cameras. The school district selected professional-grade cameras ranging from 1-8 MP which were installed at the facility's entrances, exits and parking lots. In addition, the platform allows the school district to utilize a more powerful 29-megapixel camera, which provides the coverage area equivalent to 95 of the school district's previous cameras.

School district personnel can achieve more using the new software with less training. This allows more casual users of the platform who have intense needs at times, such as administrators and secretaries, to access video in a matter of seconds, which covers a significantly larger area in comparison to the school's outdated system. With lower bandwidth and more efficient processing attributes of the software, having this new VMS system in place has provided the school district with a return on its investment in less than three years. FMJ

**Joel Staples** has been in the security integration industry for more than 16 years. He has taken on just about every role in the business including field technician, project manager, operations manager, engineering, design specialist and sales. During his tenure his work has ranged from residential security systems to modern, high-security airport systems.

Staples is an account manager at Tech Electronics of Indianapolis, a solutions-based systems integrator based in St. Louis, Mo., USA, where he designs and estimates projects and manages key accounts.

# Sustainable practices learned through SFP® helped reduce expenses.

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## The Situation

Jay Drew, CFM, SFP, has extensive facility management experience in the museum, real estate, construction—and most recently, legislative—industries. Drew is currently facility project manager for the Connecticut General Assembly in the Office of Legislative Management. He oversees 450,000 square feet of office and assembly space. Because his facilities do require a large amount of energy use, sustainability has become a top priority in recent years; especially now that energy-efficiency is becoming a government requirement.

## The Approach

With Drew's busy work schedule, the flexibility that the Sustainability Facility Professional® program provided was essential. The online materials allowed him the opportunity to study any time a free moment arose—eliminating the need to carry around additional course content. Drew is also an advocate of the instructor-led classes, praising the logical manner in which the material is presented.

Through the SFP program, he gained the sustainability knowledge he needed to advance in his profession.

*"The SFP taught me to look at projects through the eyes of the decision-makers. You've got to prove that sustainability makes sense, not only environmentally, but financially. The SFP program shows you the best way to present your case to the C-suite—from theory, to design, to implementation."*

## The Results

By earning the SFP, Drew earned credibility both as an individual and as a representative of his organization. Sustainability is one of the most important topics throughout the entire facility industry, and having an SFP on staff proves that the Connecticut General Assembly is serious about aligning their objectives with the triple bottom line.

Drew's company has now undertaken many sustainability initiatives, several of which have qualified for government rebates that have more than covered his expenses for materials.

*"By implementing the sustainable practices I learned about through the SFP program, my company has reduced operating costs by nearly US$100,000 this year alone. When you have this kind of ROI, it's easy to get project approval."*

> *"Now is a great time for facility managers to shine, because we have the opportunity to make the largest impact in sustainability. The knowledge gained from the SFP program allows you to reduce costs, improve efficiency—and beyond that—create a culture of responsibility in your organization and your profession."*

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

The IFMA SFP Credential Program® provides you with practical instruction to enhance your sustainable FM skills and the tools to earn the SFP credential in one complete program. This convenient system combines learning modules available in print or electronic formats, interactive online study tools and final SFP assessments.

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SwiftSpace's ForeSight Benching System sets a new standard for innovation: the ability to reconfigure – within minutes – without tools or professional installers.

This system removes traditional benching limitations by combining easy portability, convenient storage, attractive design and frequent set-up and takedown without the need for tools or installation professionals. The design, which is the result of intensive research, development and testing, offers a variety of work style options and the ability for quick, cost-effective reconfiguration.

- Engineered to be set up and taken down hundreds of times by anyone.
- One part number to specify with no loose parts – everything needed is permanently attached.
- Designed to fold up and be stored at 15 percent of assembled size.
- Can be quickly moved from one work area to another by one person.
- Competitively priced and offers savings on installation, storage and labor.

Find the ForeSight Benching System on the Web at http://swiftspaceinc.com/index.php.

## ENHANCE BUILDING EXTERIORS WITH BI-DIRECTIONAL LIGHTING

The FCWSX6376 by FC Lighting is a small footprint fixture with high-impact visual appeal. Design your bidirectional, up and down lighting applications using spike, spot, narrow flood and flood optics to create stunning architectural lighting effects. Consider the possibilities of how simple lighting arrangements can impact your exterior design at nighttime. This exterior fixture is available in four standard or any custom color powder coatings, as well as brushed metal and mounts to a standard electrical J-box.

Visit www.fclighting.com to learn more about this fixture.

## FIND YOUR IDEAL LIGHTING MATCH

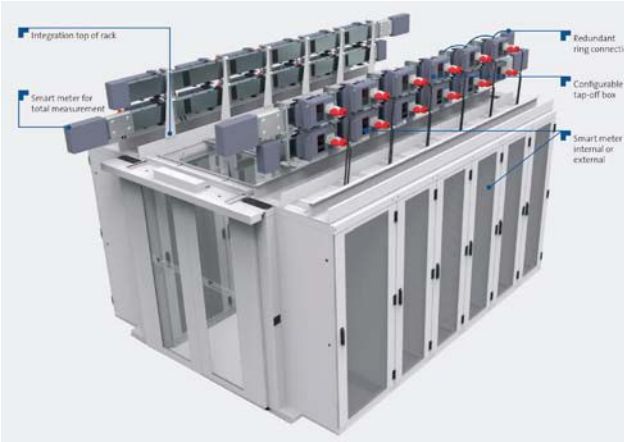
ERCO's new Light Finder is an intuitive planning tool with product search function that helps you get started with lighting design using LED technology.

ERCO's Light Finder aids the creative process of designing the right lighting concept from the first step onward. With space- and application-oriented graphics, the intuitive ERCO online tool guides architects, designers and builders quickly and visually to the ideal LED lighting solution. Accessible on mobile devices, it can also be used on the road as well as in more stable environments.

Offering separate planning sections for indoor and outdoor areas, the Light Finder meets all the requirements of precise and creative architectural lighting. Step by step, the online planning tool takes the user through up to eight criteria ranging from general questions through to specific details, aided by easy-to-understand graphics. These, for instance, define the room zones and objects to be illuminated, the height of the room, the color of light and the product color. The user can also access additional technical information.

At the end of this process, the tool provides an overview of relevant ERCO LED luminaires including technical data and product features. In addition, the user can download tender documents, 3D and planning data for light distribution, and image material for further planning. The list can be forwarded; for more in-depth consulting, direct contact can be established with an ERCO consultant.

Use the ERCO Light Finder to find your ideal light at www.erco.com/lightfinder.




## MODULAR POWER DISTRIBUTION FOR DATA CENTERS

Minkels, a global supplier of energy-efficient data center solutions and part of the publicly traded company Legrand, has launched a new solution within its VariconPower® power distribution product range. The modular busbar systems with smart tap-off boxes offer seamless integration with Cold Corridors®, providing flexible configuration options for customer-specific cold corridor layouts in data centers.

The integrated busbar system covers data center power distribution options varying from 160 amps to 1000 amps. The system is suitable for both large- and medium-sized data center environments. The solution is a safe and structured alternative to power distribution using traditional cabling. The accompanying smart tap-off boxes offer users the option of flexibly laying out a power grid in the data center.

For more on data center power, visit www.minkels.com.

## ACHIEVE VISUAL STYLE, ACOUSTIC CONTROL

Design aesthetically and acoustically winning interior spaces with the infinitely customizable and ecologically sound new EchoPanel® acoustic panels and tiles by Kirei. EchoPanel® is a decorative surface finish offering acoustic performance with a felt-like face finish. These versatile acoustic panels and tiles add color and style to any space while quieting rooms by controlling sound reflection.

EchoPanel® panels and tiles are manufactured using recycled PET plastic bottles, eco-friendly dyes and no added adhesive, resulting in a Green Tag™-certified product which can help gain LEED™ green building credits with almost no VOC emissions.

They can be attached with nails or screws using the special clips and template provided and are interchangeable when a change in color or design is desired. They are self-adhered using peel-and-stick adhesive included on each tile. Each tile has a directional finish and can be adhered to surfaces with standard construction adhesives. Panels may also be screwed to underlying surfaces or attached to wooden battens.

To beautifully shape the sound of your space, visit www.kireiusa.com/new/echopanel.html.

## DURABLE TORSION SPRING EXTERIOR CEILINGS

New MetalWorks Torsion Spring Exterior ceilings by Armstrong give architects and designers the option to extend the clean, monolithic look of these popular, large-size panels outdoors to the ceilings of soffits, overhangs and other exposed structures.

These durable, exterior metal panels provide complete downward accessibility and install easily using torsion springs in a pre-slotted, standard 15/16-inch Prelude® exterior suspension system. They are available in standard 2 feet by 2 feet and 2 feet by 4 feet sizes, three standard finishes and seven standard perforation patterns.

MetalWorks Torsion Spring Exterior is the only exterior ceiling system of its kind to offer all of these options in a standard product.

MetalWorks Torsion Spring Exterior ceilings have a Class 90 rating for wind uplift. They have a Class A fire rating and are seismic tested and approved. Made from lightweight aluminum for easier handling, the panels are scrubbable, impact resistant, soil resistant and washable. They contain up to 98 percent recycled content.

Learn more at www.armstrong.com.

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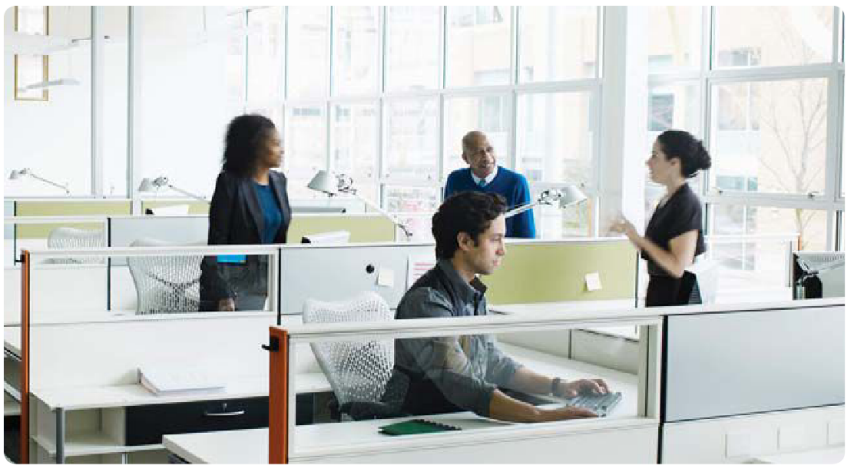
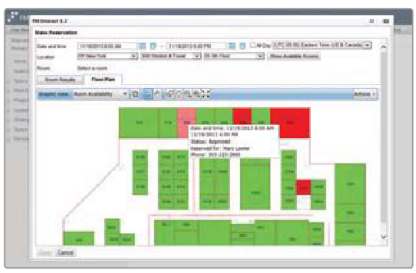
# TOOLS FOR MANAGING
# THE DYNAMIC WORKPLACE

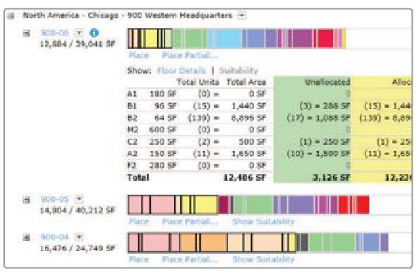


## Rapidly changing workplaces are requiring facilities teams to plan, optimize and manage their portfolios in new ways.

Modern organizations are adopting new approaches to workplace planning and operations that have been enabled by mobile technologies and a highly dynamic workforce. These new approaches include flexible workspace, support for cross functional teams, ad-hoc and collaborative areas, and flexible workspaces that break away from the practice of assigning one workstation per employee.

FM:Systems® has a powerful set of tools that are part of the FM:Interact® Integrated Workplace Management System that help organizations plan and manage alternative workplace strategies. Learn more at http://go.fmsystems.com/fmj





# FMJ EXTENDED

MARCH/APRIL 2014

THIS EXCLUSIVE ONLINE SECTION FOCUSES ON EXPANDED FM COVERAGE.

# ASK THE EXPERTS

BY IFMA'S FACILITY MANAGEMENT CONSULTANTS COUNCIL

IFMA™ FM Consultants Council
International Facility Management Association

Beginning in 2014, IFMA's Facility Management Consultants Council will share some commonly asked questions accompanied by advice from top FM consultants in each edition of FMJ. The questions and answers presented in this section will align with IFMA's core competencies following the themes outlined in each issue of the magazine.

Note: 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.

This edition of FMJ addresses **technology.**

QUESTION 1

## WHY DO INSTALLATIONS OF A COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEMS (CMMS) FAIL?

**ANSWER:** With implementation failure rates ranging from 50 to 80 percent, it is no wonder that many may consider "CMMS" a four-letter word. In my experience, I have seen numerous failed implementations and rarely an organization robustly using its CMMS.

Below are a few of the most common reasons that I have seen for such poor results.

- **Wrong system for the job –** Such as using the IT department's service request system, which falls short of the business tool that a CMMS can provide.
- **Money to buy it, but no time or help to implement it –** Often a system is purchased but no support is budgeted for implementation or administration, leaving FMs to implement in their spare time.
- **Old, slow system –** Many are stuck with an old system that is slow, not mobile and/or has limited features.
- **Don't know what you don't know –** Lack of knowing any better is probably the most common reason for failed or under-utilized CMMS installations. Most don't know how powerful a CMMS is or how it could be used to manage day-to-day operations and to drive better business decisions.
- **The good news –** Soliciting knowledgeable assistance can help ensure that the CMMS utilized is a valuable business tool for the FM department.

The above is an excerpt from "CMMS is not a Four-Letter Word." To read this or related articles, visit fm360consulting.com.

ANSWERED BY:
**John Rimer, CFM**
President, FM360
Chair, FMCC Marketing Team
The Road to Better Facility Management
fm360consulting.com

## QUESTION 2

**WHAT ARE THE THREE "QS" TO LEAD YOUR TECHNOLOGY INITIATIVE TO SUCCESS AND TO KEEP YOUR BUDGET SMALL?**

**ANSWER:**

**Quantity and resources.** "Less is more" is one of the most important criteria when implementing technological solutions such as CAFM/CMMS/IWMS into your organization. However, it is not the only item to be considered. At the start-up stage you should define further criteria in order to lead your CMMS, CAFM or IWMS project to a successful result and maximize the benefit it provides. One of the key factors is to have the right person in the right place.

**Quality and process.** Since asset data is the foundation of business processes it is quite important that you find and define the depth and degree of detail necessary for your unique organizational needs. Typically, service providers work in less detail than building or property owners. In addition, ensure that your resources and staff are able to maintain the data and keep it updated at all times, as incorrect data is even worse than no data.

**Query and optimization.** Once you have defined the necessary scope and begun implementation you should revise your aims, timelines and budgets, as well as user maintenance requirements, on an ongoing basis.

Hungry for more information? Please ask your FMCC consultant.


ANSWERED BY:

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## QUESTION 3

**THERE SEEM TO BE MORE AND MORE DISCUSSIONS FOCUSING ON SENSORS AND BIG DATA. WHAT SHOULD I BE CONSIDERING FOR MY FACILITY?**

**ANSWER:** Some of you might recall the days prior to BACnet protocol when building systems were largely proprietary and did not communicate with other software programs. As FMs we could see the additional costs, service inefficiencies and increased risk of human error due to entering the same piece of data over and over again. Then in 1995 the BACnet protocol broke down the wall and software programs were required to "talk" or interface with one another and a new era was ushered in.

Twenty years later we are now seeing the evolution of sensors and data in a similar fashion. We have seen sensors individually measuring temperature climate control, other sensors measuring motion for intrusion, access cards or space control, sensors to determine moisture levels in landscaping, sensors measuring traffic flow, people counters for workplace strategies, sensors aboard aircraft sending signals to airports "requesting" services such as fuel, baggage handlers, security, etc. — and the list goes on. But that data, now called big data, is getting saturated every second as it gathers intelligence for more effective facility management operations.

If you want to discover how sensors and big data are being further integrated and may help your facilities, join us at Facility Fusion in Washington, D.C. at "FM in the City" on April 16, 2014 as we take a look at the latest trends in technology being innovated in Washington and at other cities around the world!

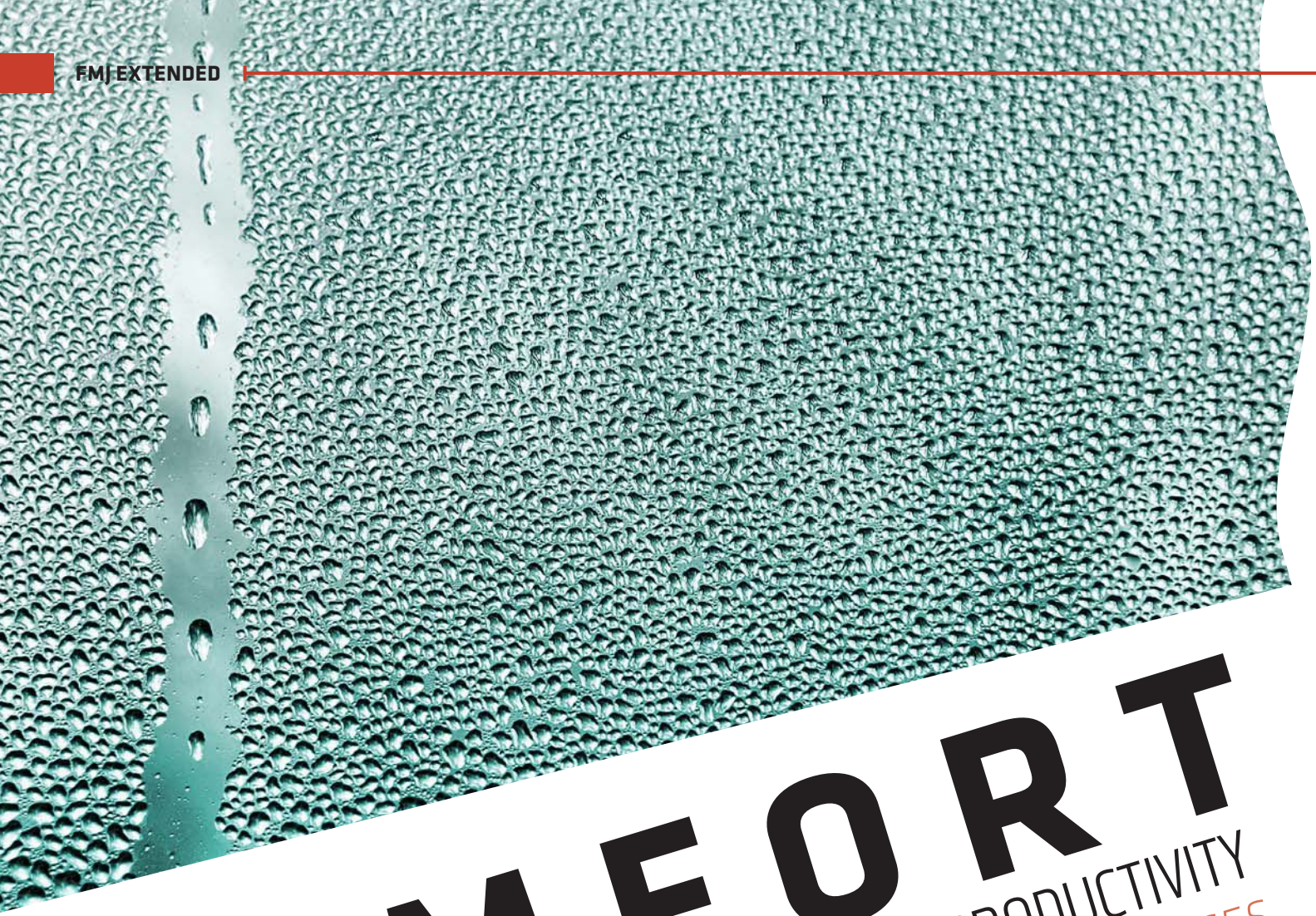

ANSWERED BY:

**John Ringness, SFP, MRICS, CBIFM**
President, NEXT FM Solutions
President, FMCC
john.ringness@nextfms.com
www.nextfms.com


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."

Questions regarding the Ask the Experts section of FMJ can be directed to John Ringness, SFP, MRICS, CBIFM, president and CEO of NEXT Facility Management Solutions and FM Consultants Council president, at john.ringness@nextfms.com.

Visit FMCC online at fmcc.ifma.org or http://linkd.in/1gAa8ae.



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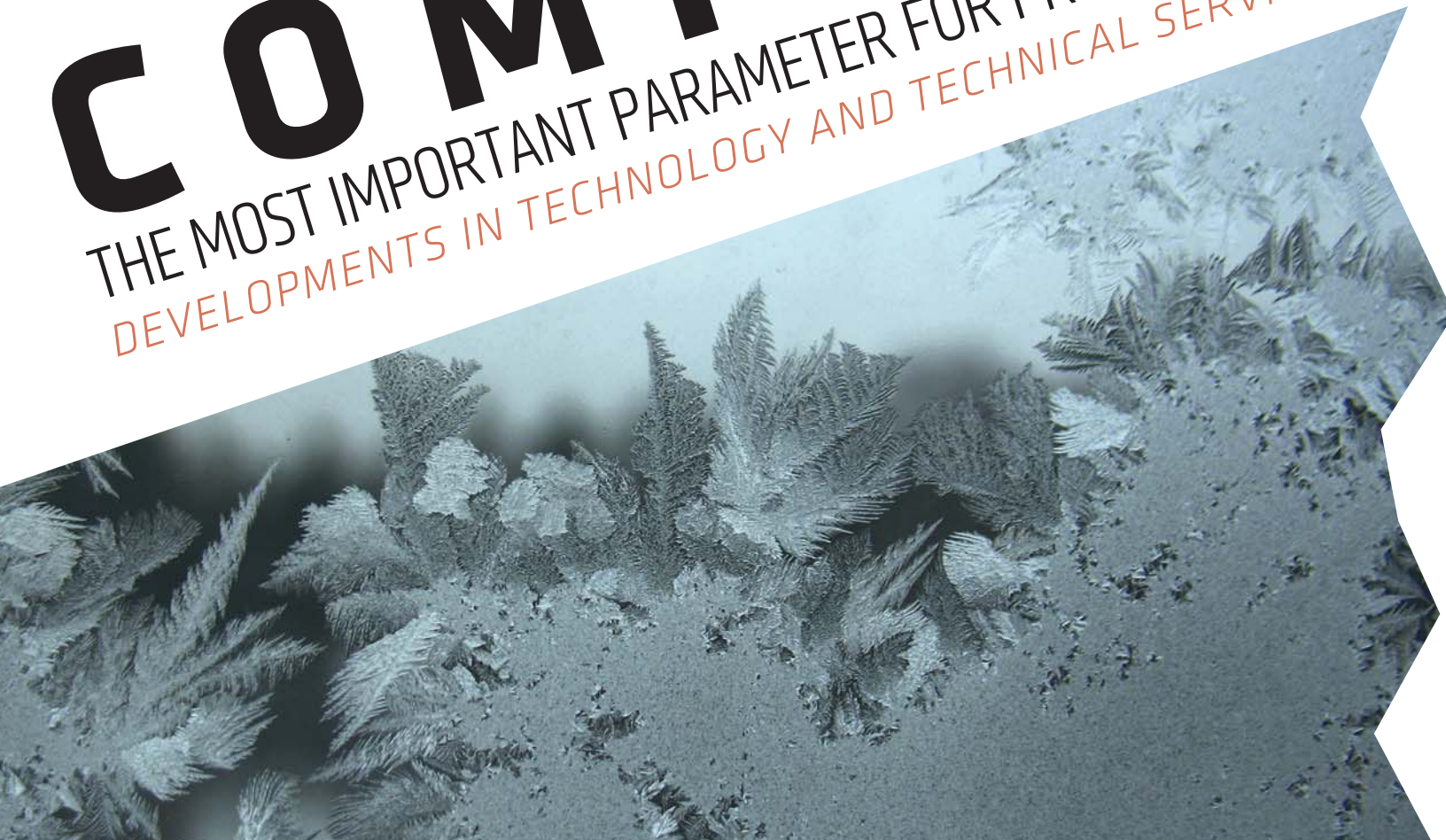
## THE MOST IMPORTANT PARAMETER FOR PRODUCTIVITY

DEVELOPMENTS IN TECHNOLOGY AND TECHNICAL SERVICES



BY BERT ELKHUIZEN & MAAIKE KUIPERS

***This article was contributed by Facility Management Netherlands from their official publication, FMI, and has been translated from the original Dutch.***

What developments in the areas of technology and technical services can we expect in the coming years? Are there innovations that will surprise you? Or will you have to make do with the technologies that already exist? And what will be your facilitating role in influencing these innovations?

Trends such as "prosuming" buildings (buildings that consume, but also produce, energy), thermal comfort (which can improve work productivity by up to 11 percent) and energy service companies (companies that take over the installation and management of temperature regulation systems) are just some of the innovations on the horizon.

The following five technological developments will be important, particularly for existing construction.

## 1. From new construction to existing construction

There are numerous possibilities within new construction to implement new technologies for the benefit of interior climate, lighting, energy savings and sustainability. Gone are the days of incorporating building performance tools as an afterthought. New construction projects are increasingly subject to sustainability scrutiny under standards such as BREEAM (Building Research Establishment Environmental Assessment Methodology).

Two examples of buildings in the Netherlands that recently received the highest BREEAM new construction label are TNT Hoofddorp and Lely Maassluis. The technologies that were applied within these buildings provide a good perspective into how facility technology has changed and the possibilities for sustainable building and remodeling. Some examples: Follow-me-home lighting for exterior terrain, use of architectural solar panels, cogeneration, geothermal heat pumps, green roofs with solar collectors, windmills, electrical charging poles on parking structures and far-reaching individual ability to control building temperature.

The latter is a strikingly different principal from that which used to guide existing buildings, which aimed above all to avoid occupant temperature adjustments as much as possible in favor of keeping the interior climate at a predetermined constant level in order to minimize complaints about thermal comfort.

The regulations in the area of energy efficiency for new construction will also be significantly intensified in the years leading to 2020. In a few years, we must switch conceptually to "prosuming" buildings (near net-zero energy buildings) for which energy consumption and production balance out on an annual basis.

Most of the technologies available for new construction can also be applied, to a greater or lesser extent, to existing construction. For example, solar photovoltaic retrofits are becoming more common, although panel efficiency and pricing could still use improvement. However, with the rapid pace of developments, the business case for incorporating many of these newly developed technologies within existing buildings is strengthening.

## 2. Thermal comfort in buildings

The project managers of the Lely Maassluis building had a well-substantiated reason for choosing to allow individual regulation of the interior climate in a far-reaching manner. Comfort is, after all, an individual experience. Recent research has also indicated that a fluctuating interior climate contributes to the fitness of employees. The body becomes lazy, in a manner of speaking, from a constant temperature, so precisely through slight variations in the temperature, the body becomes activated, which is very good for the physical constitution.

These types of new insights will lead to more attention to comfort in the coming years and to the possibility that it will become a big trend. Adjusting comfort-related elements such as noise, ventilation, lighting and temperature can, in particular, improve the productivity of building users by up to 11 percent. Of that percentage, thermal comfort (not being too warm, too cold or in the presence of a draft) counts the most by far with 7 percent. When these elements of comfort can be properly regulated, even short-term absences due to illness can decrease by 0.5 percent.

From the literature, we know that thermal comfort is the most important parameter for productivity and at the same time, it is the one thing that building users complain about the most. In order to improve comfort and with it, user satisfaction, it is therefore necessary to pay attention to employees by listening to and properly registering their comments and complaints. In this way, you can localize and resolve possible problems (comfort management). Paying more attention to comfort levels provides a win-win situation for all building stakeholders.

## 3. Improve reliability with hard services

In order to improve comfort, the next development that we will see in the coming years is not technological, but a rather a shift in attitude and behavior. It must be determined what defines comfort today and how we can best provide this standard to occupants.

It is well known that discomfort can be attributed, in large part, to poorly functioning installations. This does not necessarily mean that new technical installations must be immediately implemented; on the contrary, it is important to ensure that existing installations function properly, are under control and are reliable. This has

**TECHNOLOGICAL DEVELOPMENTS**

- Reducing energy demand by implementing complete demand control on lighting, ventilation, heating and cooling
- Increase in the number of LED applications
- Follow-me-home terrain lighting
- Electric charging points equipped with sustainable electricity

**DEVELOPMENTS IN SUSTAINABLE ENERGY**

- Cogeneration
- Residual heat industrial processes
- Bio/geothermal energy
- Residual heat, combined with absorption cooling
- Solar photovoltaic cells integrated on the building façade (these can be incorporated in an aesthetically pleasing manner)
- Wind turbines attached to buildings (as yet unproven)

everything to do with the knowledge that exists about the functioning of installations, at the principal (often the facilities company) as well as at the installing party. And nothing will improve in the current manner of maintenance and vision on the technical installations. A different manner of maintenance control is required for that purpose.

But the principal must also request maintenance in a different way. It is no longer sufficient to only check the technical condition of components; it is important to get a better view into the performance of the entire system. Does the system perform in the way in which it was installed and does it deliver the level of quality that was set in advance? That is where the focus must lie, which follows the guidelines recently published by ISSO (knowledge institute for the installation sector) regarding sustainable management and maintenance. These guidelines outline the direction needed for the future of maintenance and facility management. Typically, installers aim solely to achieve properly functioning installations. Maintenance professionals, however, have more of an operational than technical focus, which contributes to better comfort and lower energy usage.

## 4. Measuring and analyzing

There are also, of course, technological developments. Intelligent systems now make it possible to remotely read and analyze performance, particularly relating to comfort and energy efficiency. Data gathered by building management systems can be converted with unique knowledge rules into system performances and quickly make it clear whether installations are functioning well or not. An installation can be automatically adjusted or installing parties and technicians can respond immediately to problems. In this way, you can avoid disruptions and complaints about comfort.

Note that a building management system in itself does not satisfy the definition of an intelligent system. Usually only one control is given with a building management system, along with one control on operation, to an insufficient degree. Intelligent systems link all the available data, often from different systems, to each other. An intelligent system can also produce various reports: for the maintenance person, for the facility manager and for management. All have the need, at different times, for a different type of report specific to their needs.

It is also important to benchmark installation performances. However, there is still too much focus on building history and the performance of comparable buildings. An even better approach is to compare the current performance against those of the ideal situation. When performance levels of different installations are viewed in this manner, all sorts of problems can arise that would not have otherwise been seen. This approach can lead to surprising insights and savings.

An example of this approach is the Cofely Energy Navigator. This intelligent system can detect malfunctions based on measured energy usage (hour values). An average of 15 to 35 percent in energy savings (smaller, easier success) is detected in this manner and with it, a significant reduction in the service costs is achieved.

## 5. Financing by means of ESCO

Compared to other countries, it is very difficult in the Netherlands to get energy saving started. It is not always easy to make the business cases for green investments. Investments abroad for the benefit of energy savings are often financed and implemented by energy service companies (ESCOs). These are companies that take over the installation, maintenance and management of a building's climate installations.

An ESCO company supplies guaranteed energy savings, often including financing. The principal does not have to invest in order to finance and therefore does not have to deal with investment costs, which enables energy savings without impacting the budget.

In other countries, the government stimulates this approach, but in the Netherlands, the market is a bit slower. However, in countries such as Portugal, Germany, Finland and America, this market is taking off. What makes an ESCO interesting is the savings generated within the payback period of five to 10 years. The ESCO assumes the risk in the case that savings are not achieved.

Many government buildings in the German municipality of Berlin have been renovated using ESCOs using government support in order to develop the market. It seems that the market in the Netherlands is getting ready, step-by-step, to join an ESCO as trust builds. Examples from abroad have demonstrated that the concept can by successfully implemented, and as the market in the Netherlands moves toward this approach, we can expect to hear more about ESCOs in the next five years. **FMJ**

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# VISUAL ENGAGEMENT

*Using video to gain stakeholder commitment*

When it comes to the expansion of a campus or new building in higher education, boards often dictate what an institution does — or doesn't — do; they are often consensus driven and want to know there is support for a project before considering it. And rightly so. For years, architectural models of a proposed residence hall, fitness center or stadium would have been prominently placed in lobbies in an attempt to show incoming students, potential donors, faculty and staff, and alumni what might be in order to gain wide stakeholder support.

But increasingly, boards are looking for additional ways to market capital campaigns apart from traditional physical models, often turning to film as their primary tool. According to Forbes, 50 percent of executives look for more information after seeing a product/service in a film and 59 percent would rather watch a video than read text. Among institutions of higher learning, 86 percent have a presence on YouTube, offering an existing channel for the film to reach a broader audience.

Just as many campuses are evolving, so is film. Today, through a careful mix of 3D animation, live-action videography, motion graphics and even interactive capabilities that allow students or potential donors to "walk through" a virtual world, audiences can experience the project as it will exist in the future.

As any Hollywood director knows, films can be a powerful way to spur a constituency to action. But the first step to achieve that is to get to know that constituency through a discovery phase with competitive audits, audience research and collaboration with everyone involved in marketing strategy.

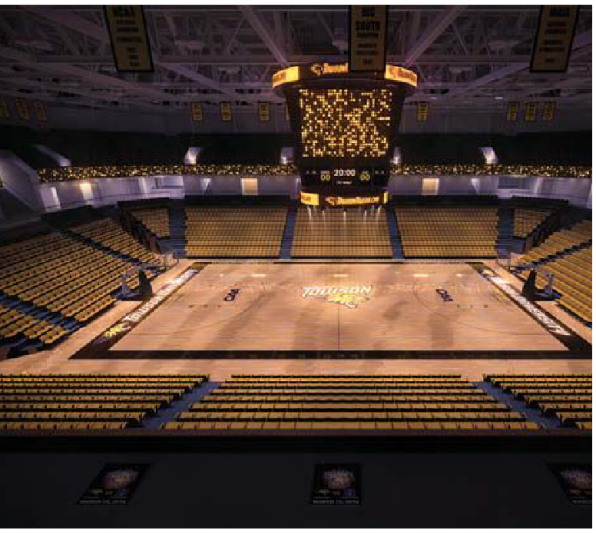
Once that is done, in order for a video to be successful for a higher education capital campaign, it needs to accomplish three things:

**1. Be clear on the audience.** If the goal of building a new research facility is to recruit world-class talent, a documentary-style film with interviews of scientists about their vision combined with a visualization of the laboratory can be the most effective.

If a school is building a new stadium and alumni are huge basketball supporters, do what Towson University did for its Towson-Tiger SECU Arena: Use the school's fight song and images of a sold-out crowd cheering in the stadium and play the film during a game intermission to drive excitement. The 5,200-seat multi-purpose arena serves as a continuing investment for a school-spirited university with a lot of pride in athletics.

If the film will be used to explain a project to the surrounding community, go in for a soft sell, highlighting relationships, the history of the area and the vision, rather than the particulars of design.

If the film is meant to drive fundraising, add a potential donor's name above the virtual wing of the building using 3D animation as a way to personalize the pitch or to create a legacy piece, as Georgetown University did with a film for its Rafik B. Hariri building that is part of the Georgetown McDonough School of Business. The film for Georgetown served as a documentary that captures the success of the new 179,000-square-foot, five-story state-of-the-art technology building. Everything from the architecture to the different amenities and the donors' names on the wings were highlighted through the visualization of the documentary. The building opened in 2009.



*All images courtesy of Neoscape.*

**FROM TOP:** *Alan B. Miller Hall at the College of William & Mary's Mason School of Business; Colorado State University Lory Student Center; Towson University's Towson-Tiger SECU Arena.*

**2. Always find an emotional connection.** Just as the architecture of the building is meant to create an emotion, so too, must the film. Alumni in particular want to feel inspired and proud of their alma mater, especially if they are looking to invest in the school's development. Little details, such as glimpses of the mascot, scenes from a cheering crowd at a football game and fall foliage on the campus help make the film feel authentic to graduates.

This was shown in a video made for Colorado State University's Lory Student Center renovation in order to create excitement among the student body, whose support was needed to release the funds for the massive project. The film was in fact a vital part of the process that led to a successful student fee vote. The film's vibe was fun and transformational, illustrating the future student center with the use of convincing, life-like visuals. It did not show shot after shot of renderings, but showed how the building would transform to appeal to and excite the student body. The project is scheduled to have a partial opening in August 2014, followed by a full opening before the end of 2014.

**3. Further overall branding.** The video should instantly feel like a marketing asset belonging to the specific school, branded with colors, music suited to the school culture and scenes from the community, if appropriate. These small details can have a big impact. It is also important to note that 45 percent of viewers will stop watching a video after one minute and 60 percent by two minutes, according to Visible Measures. Keeping the video on brand and to the point is important in order to capture and retain the attention of viewers who might be potential donors.

The campaign for the College of William & Mary's Alan B. Miller Hall of the Mason School of Business takes the viewer from the blueprints of the hall through the 166,000-square-foot building rendered to look complete and full of students. The tone captures the sophisticated branding of William & Mary and was therefore not only used as a capital campaign to successfully raise US$50 million, but as a recruiting tool as well. The architecture of the hall was dissected through the technological renderings of the film creating a visualization of the building coming together. The film was the number one tool used in marketing this campaign and helped the project to open on time and stay within budget.

There's no slowing down the growth of and demand for film. In 2012, video was the fastest-growing ad medium according to Insivia. The use of video serves as an additional asset to help reach a larger audience — one that was never possible with only a physical model of a potential project displayed on site.

A picture may be worth a thousand words, but the use of video brings the story of "what could be" to life in an emotional context to help make a project into a reality. And, according to Brainshark, the information retained from one minute of video is equal to about 1.8 million written words. That's a significant opportunity to reach potential donors through the power of visualization. **FMJ**

**Bryan Holmes** is a vice president at Neoscape. He is the representative for all new business and manages Neoscape's sales and marketing team.

Holmes' wide range of clients and projects includes marketing campaigns for Akridge's 1200 Seventeenth and American Realty's 499 Park Avenue, fundraising films for Colorado State University and the College of William & Mary, as well as technology concept films and interactive applications for Autodesk and EMC. He also manages Neoscape's collaboration with Haworth to design virtual sets that showcase product lines — from individual furniture pieces to entire floor systems.

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