

May/June 2004

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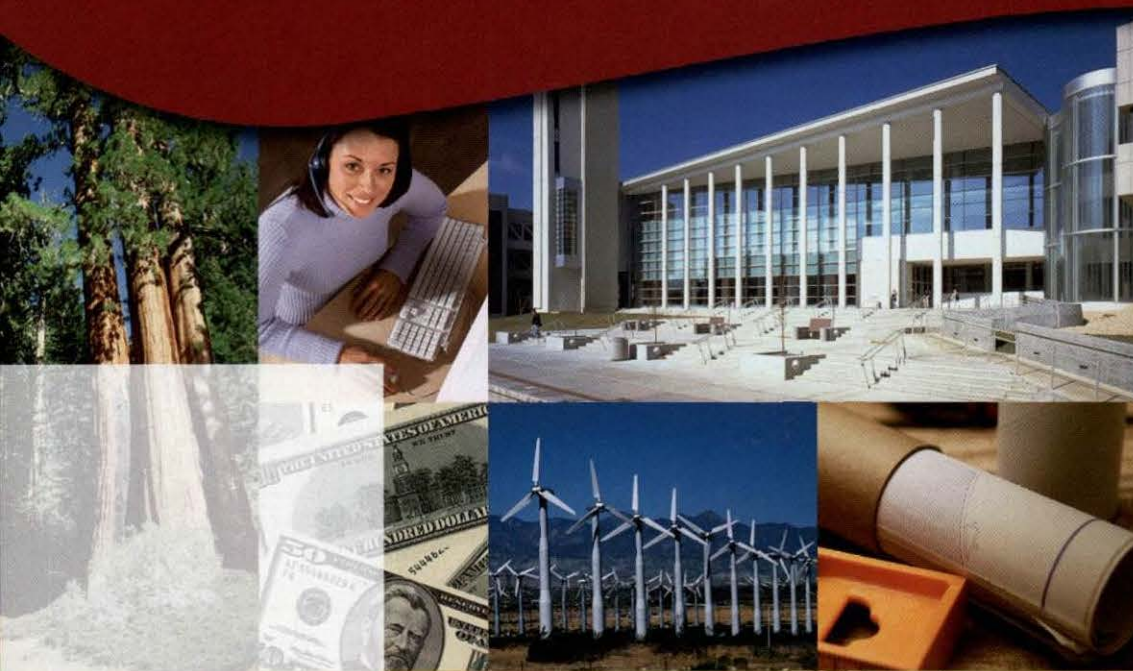
NUMBER 3

# Facilities Manager

The official publication of APPA: The Association of Higher Education Facilities Officers



## Forum Perspectives



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WASHINGTON, DC  
**2004**  
Educational Facilities  
**LEADERSHIP  
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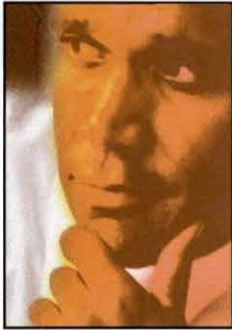
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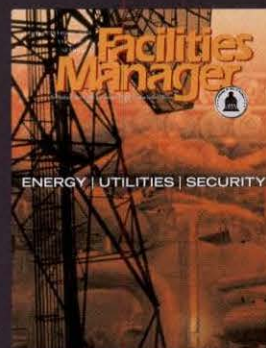
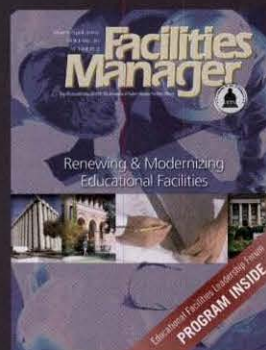
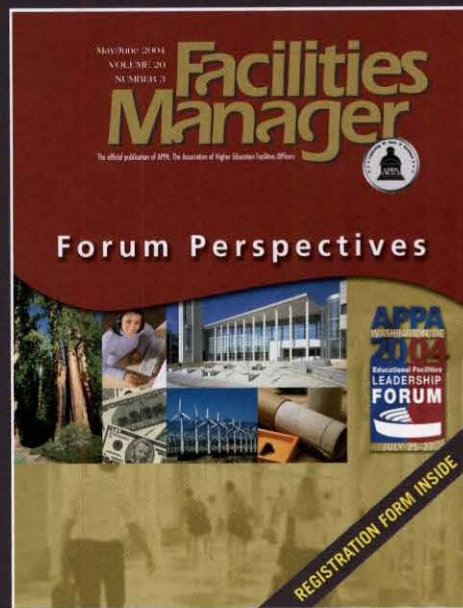
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Global Partner in Learning

## From the Editor

by Steve Glazner

The APPA staff, Educational Programs Committee, and Welcome Committee are busily preparing the final details for your attendance at the 2004 Educational Facilities Leadership Forum. Set for July 25-27 in beautiful and exciting Washington, D.C., the Forum promises to challenge and stimulate everyone who cares about high-performing educational facilities.

We urge you to register today if you have not already done so. The early-bird registration fee of \$595 for APPA members (\$795 for nonmembers) has been extended indefinitely, and it is a bargain. In addition to three keynote/general session speakers, numerous concurrent educational sessions, a dynamic and cohesive Hall of Resources, and up-to-the-minute experience exchange sessions, your registration to the Forum also includes the Welcome Party, three breakfasts, two lunches, the banquet, and much more.

We are truly pleased to have the Capitol Steps as our banquet entertainment this year. This comedy troupe entertains with hilarious, on-target song parodies that skewer politics and politicians. And with the Forum overlapping with the Democratic National Convention this year, you can be sure that if it's in the news that week, we'll hear about it at the banquet.

You may want to extend your stay in D.C. to enjoy the many sites, memorials, and museums that make Washington a grand city indeed. In addition, you may want to arrange in advance visits to some of the many excellent colleges, universities, and schools in the immediate area, including:

### D.C.

American University  
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Gallaudet University  
George Washington University  
Georgetown University  
Howard University  
Trinity College  
University of the District of Columbia  
Wesley Theological Seminary

### Northern Virginia

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Marymount University  
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The Potomac School

### Suburban Maryland

Montgomery College  
Prince George's Community College  
Towson University  
University of Maryland/College Park

You can also drive a bit further to the University of Virginia in Charlottesville; Old Dominion and Norfolk State universities in Norfolk; College of William and Mary in Williamsburg; Johns Hopkins and Loyola College in Baltimore; St. John's, Anne Arundel Community College, and the Naval Academy in Annapolis; and Hood College in Frederick, Maryland. Those are just a sampling of the excellent educational institutions that reside in the District, Maryland, and Virginia. We hope that you will find the time to visit one or more of them this summer.

To register for the 2004 APPA Forum, please visit [www.appa.org/education](http://www.appa.org/education). We look forward to seeing you in Washington, D.C. this July. 🏰

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Compiled by Betsy Colgan

## Election Results Are In!

APPA's officers for 2004, with installation taking place this July at the Forum, are:

### President-Elect

Jack Colby, North Carolina State University

### Vice President for Educational Programs

Sam Polk, Tennessee State University

### Vice President for Information and Research

Mike Sofield, Smithsonian Institution

The four Bylaws changes were passed and became effective immediately. To read the complete text of the new Bylaws, please visit [www.appa.org](http://www.appa.org). Thanks to the Tally Committee for tabulating the results: Chair Al Stearns, member emeritus; Patrick Andriuk, Episcopal High School; and Al Guggolz, member emeritus.

## Put These Dates in Your PDAs

June 20-24—Leadership Academy. Visit [www.appa.org/education](http://www.appa.org/education) to register.

July 25-27—Educational Facilities Leadership Forum. For registration information, visit [www.appa.org/education](http://www.appa.org/education).

September 12-16—Institute for Facilities Management; registration opens June 1, 2004.

September 12-16—Supervisor's Toolkit: Nuts and Bolts of Facilities Supervision; registration opens June 1, 2004.

## Start Planning Now!

An historic event is happening July 8-11, 2006, in Honolulu, Hawaii. A first of its kind joint conference hosted by APPA, National



Association of College and University Business Officers (NACUBO), and Society for College and University Planning (SCUP). The benefits of a joint meeting include:

- an opportunity for members to attend one conference that meets all their needs
- a single educational event for individuals who wear many hats on the job
- the chance to access high-quality, joint educational programming addressing the top issues in higher education
- the opportunity to build synergy and trust across the educational community
- Registration and travel savings if you normally attend one or more of these annual conferences

Clearly, this will be the most valuable networking event of 2006. Look for more information in future issues of this magazine.

## Are You Listed?

Facilities professionals use hundreds of products and services each month—where do they find their suppliers? If they are a member of APPA, they can turn to APPA's Buyer's Guide. For this reason alone, it makes sense to list your company in this guide. As a Business Partner, you are eligible for one free listing; additional listings may be added for \$75 each. If you are not a Business

Partner of APPA, visit [www.appa.org/membership/businesspartner.cfm](http://www.appa.org/membership/businesspartner.cfm) for information on how to become one.

## AIA Announces 2004 Winners!

The American Institute of Architects announces the 2004 Recipients of the AIA Education Honor Awards. The awards were presented to the recipients on March 19 at the Association of Collegiate Schools of Architecture annual meeting in Miami.

Selected as exceptional models of instructional and educational excellence in classroom, studio, community-based service learning, or laboratory work were:

- "Preservation Praxis," taught at the New School of Architecture, Polytechnic University of Puerto Rico and at the University of Pennsylvania, Graduate Program in Historic Preservation
- "Envisioning the Future of the South End Neighborhood," taught at the School of Architecture, University of Illinois at Urbana-Champaign

For more information, contact AIA's public relations office at 202-626-7462 or visit [www.aia.org](http://www.aia.org).

## Great Schools by Design

A major initiative aimed at transforming the way America's public schools are planned and designed was announced in March by the American Architectural Foundation. Great Schools by Design was developed in response to the challenges communities face because of the deteriorating condition of the public schools and the need to build new schools. One-fifth of the U.S. population (55 million) spend their days in elementary and secondary school buildings, many of which are



in disrepair. This initiative has two goals:

- To be a resource to school and community leaders and to inform them about leading edge thinking in school design, and
- To create a national forum for the major stakeholders in school design to think creatively about the larger issues affecting the design and construction of schools.

Forums with superintendents, teachers, and other stakeholders to discuss these issues will be held in late spring and summer. These forums will provide the background for a major national summit on school design to be held in 2005.

For more information on this initiative, please visit [www.archfoundation.org](http://www.archfoundation.org).

#### Facilities Salaries Increase

The International Facility Management Association (IFMA) has released a new salary report that shows an estimated 21 percent leap in compensation for facility management professionals in the last five years. Based on a survey of 4,700 IFMA members, the *Profiles 2003* report shows the median base salary for facility professionals has risen from \$60,000 in a 1998 *Profiles* report to \$72,500. The report showed that advanced degrees and the Certified Facility Manager designation have a significant impact on earning potential.

To obtain a copy of the *Profiles 2003* (IFMA Research Report #24), e-mail [bookstore@ifma.org](mailto:bookstore@ifma.org).

#### Did You Know...?

*First campus building:* Old College at Harvard University. Completed in 1644 and used for 35 years; abandoned because of its poor design.

*Oldest academic structure:* Sir Christopher Wren Building, College of William and Mary. Built in 1695 and ravaged by fire in 1705, 1859, and 1862.

*Largest university by acreage:* The Ohio State University with 15,246

acres as of September 2003.

*Largest university library:* Widner Library, Harvard with 3.5 million books.

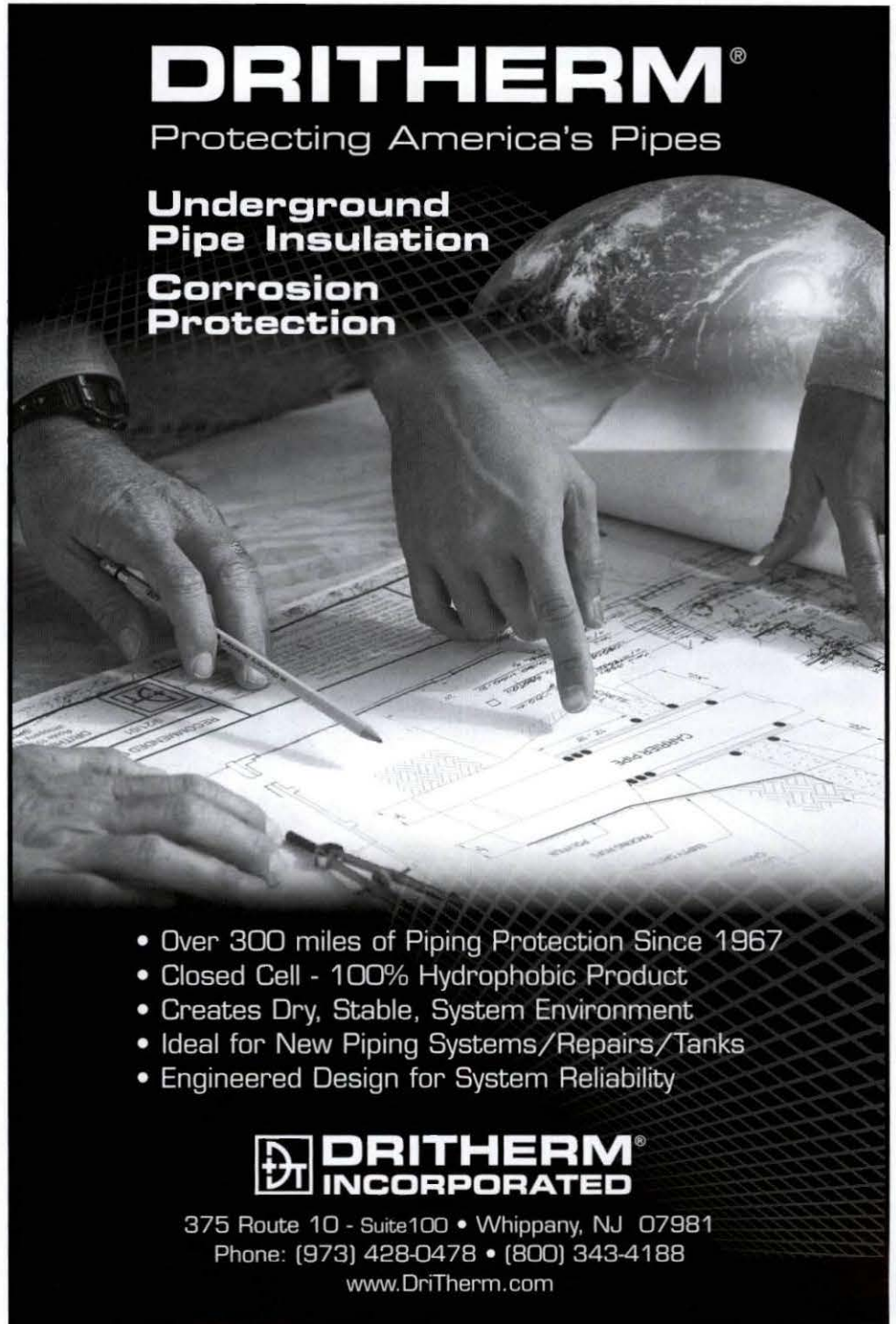
*Tallest college building:* Cathedral of Learning, University of Pittsburgh. Built in 1937, it is 535 feet high with 42 stories and 2,529 windows.

*Tallest bell tower:* Sather Tower, University of California at Berkeley. Built

in 1914, it is 307 feet high with 61 bells, the lightest weighing 19 pounds and the heaviest 10,500 pounds.

*Largest campus stadium:* Michigan Stadium, University of Michigan with a capacity of 107,501.

—*Chronicle of Higher Education*. 🏰



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## Catching the Big One

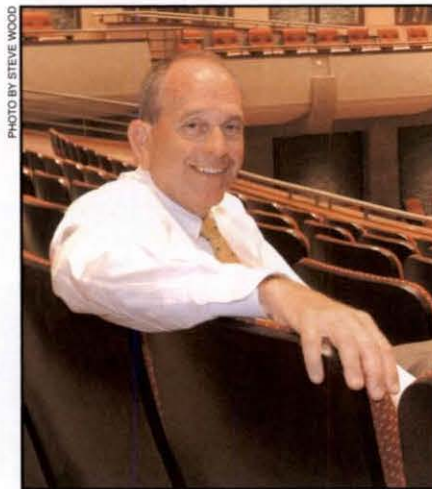
by Brooks H. Baker III

As I write this article, we are experiencing springtime in Alabama. This time of the year is when my son Hop and I begin to get excited about farming and fishing. I'm sure many of you remember the opening scenes from the Andy Griffith show where Opie and Andy are walking down the gravel road to go fishing. Well, if you hold on to that mental picture, you can have a bit of an idea about why we look forward to spring here in rural Alabama. The small town where I live would remind you of Andy Griffith's Mayberry in many ways. It is still small enough for everyone to know everyone else and small enough to know several generations of everyone's family tree.

Our small town has seen some positive changes such as a much improved fire department, more stores, and shops. You know, some 90 years ago, APPA started out as a small community of facilities professionals who banded together in order to find ways to help each other in their jobs in higher education. Unlike our small town that has grown very little over the last 90 years, APPA has expanded its membership and geographical reach to include facility officers and business partners from all parts of the United States and much of the world. This growth has occurred because APPA provides services to its membership that are seen as valuable, not only to the facilities professionals, but to our administrators as well. We are truly becoming more of a Global Partner in Learning.

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**Brooks Baker is the associate vice president for facilities at the University of Alabama at Birmingham and the 2003-04 APPA President. He can be reached at [bbaker@fab.uab.edu](mailto:bbaker@fab.uab.edu).**



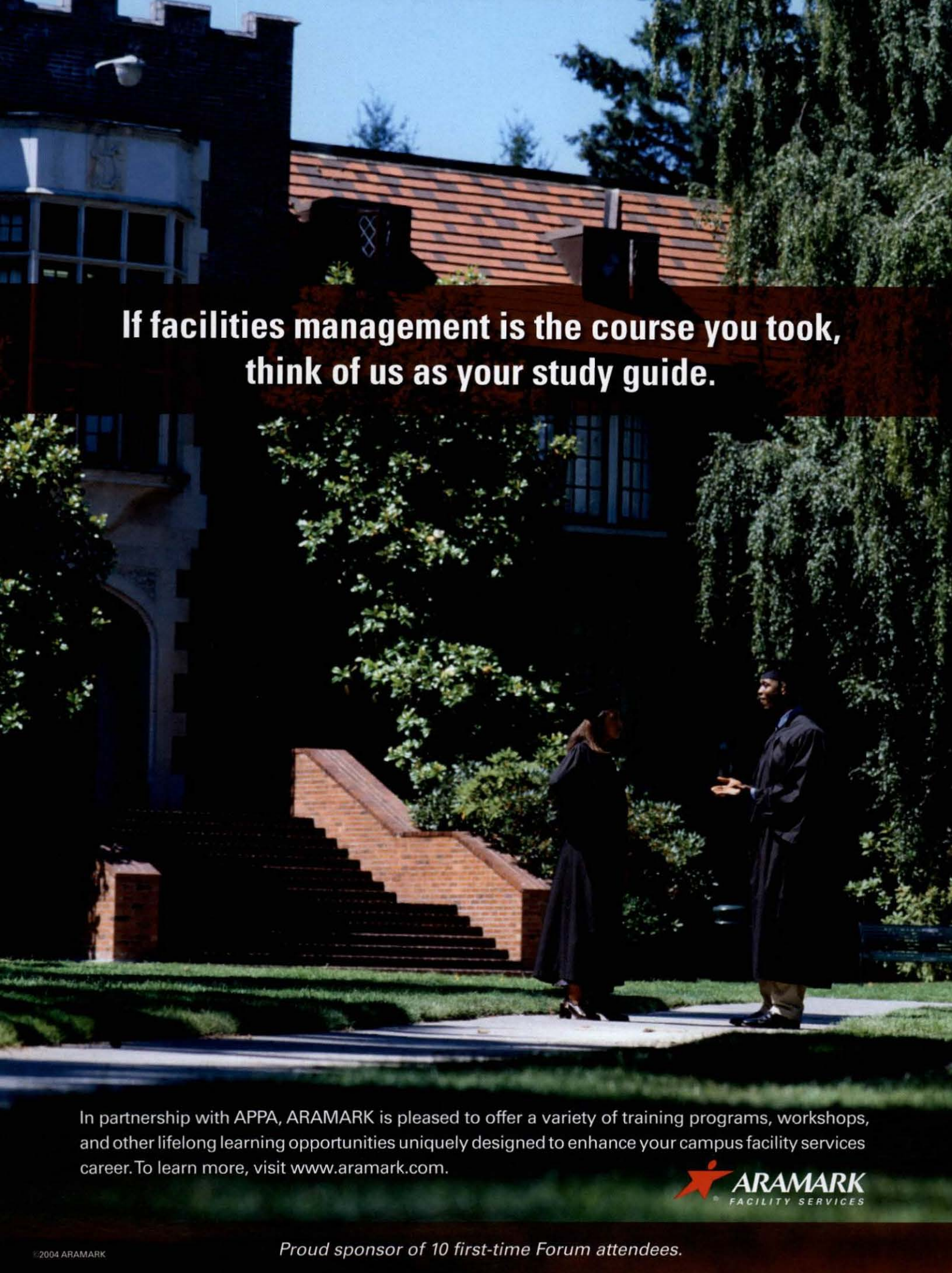
Recently I was at a meeting where I met a newly appointed vice president of a major university. This vice president had called in a consultant to evaluate the physical plant operations of his university. The consultant, of course, had a number of recommendations regarding the physical plant, one of which to my delight was to contact APPA for further resources in facilities management.

As members of facilities staffs, we are bombarded weekly with information from other facilities management organizations and are given opportunities to participate in a menagerie of events that reportedly are designed to help facilities managers. Some of these events are sponsored by excellent organizations while others host meetings for purely financial reasons. One thing is certain, there is no other organization or association with the mission of advancing the professional skills, expertise, and motivation of higher education facilities officers that can come close to matching what APPA can provide. With all of the offerings that are available, we need to select meetings and educational programs that can help us not only to advance in our profession, but also to advance our profession as well.

Remember that mental picture of Opie and Andy that you got at the beginning of the article? Well, one Saturday Hop and I got out the old flat-bottom boat and the 40-year-old outboard and headed for one of our farm ponds. Hop has big plans for "catching the big one," while he is taking a break from school for spring holidays. This is also a good time for us to go fishing for APPA. As members, we need to be making calls to those cohorts of ours who are not members of APPA. We also need to recruit members for APPA from our own organizations who not only need the experience of professional development in APPA, but who also can be future leaders. Take time today to pick up the phone and make one call and try to "catch the big one."

You may have some apprehension about talking to prospective members about becoming a member of APPA. They may have a question to which you may not know the answer. Also, since we are facilities folks and not sales people, closing the sale may be a bit of a problem. Don't let any of that stop you from giving someone the opportunity to improve themselves through membership and participation in APPA. I recently told a potential business partner about our association and he was quite interested. I sent his mailing address to Randel Edwards at [randel@appa.org](mailto:randel@appa.org). Within a couple of days, a packet of information and an application for membership were in the mail to this individual.

So, pick up the phone and call some potential members or tell your next vendor contact about the need to become a business partner of APPA. Remember, it will benefit not only our association; it will also benefit the new member. 🎣

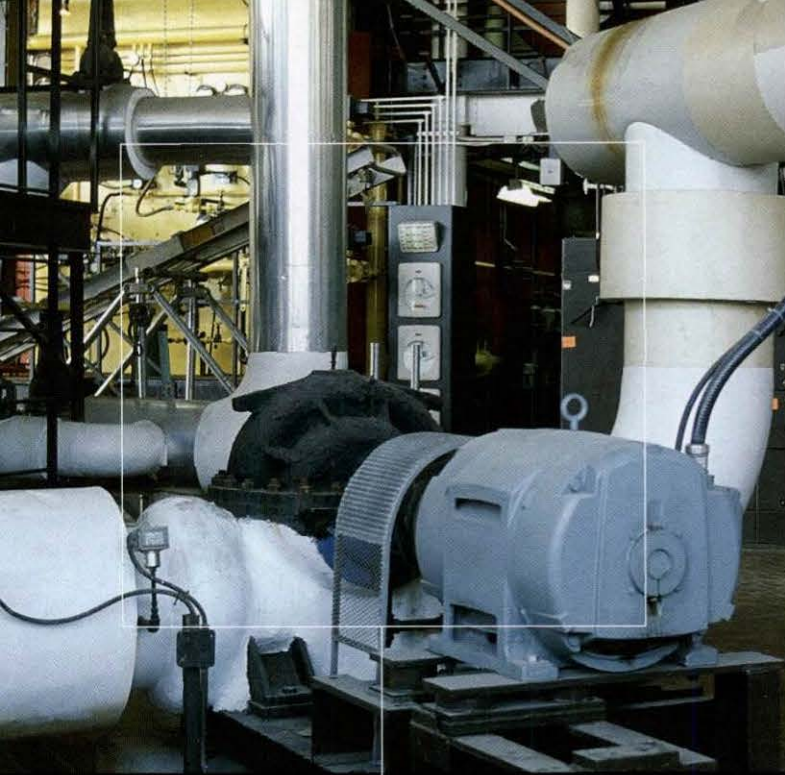


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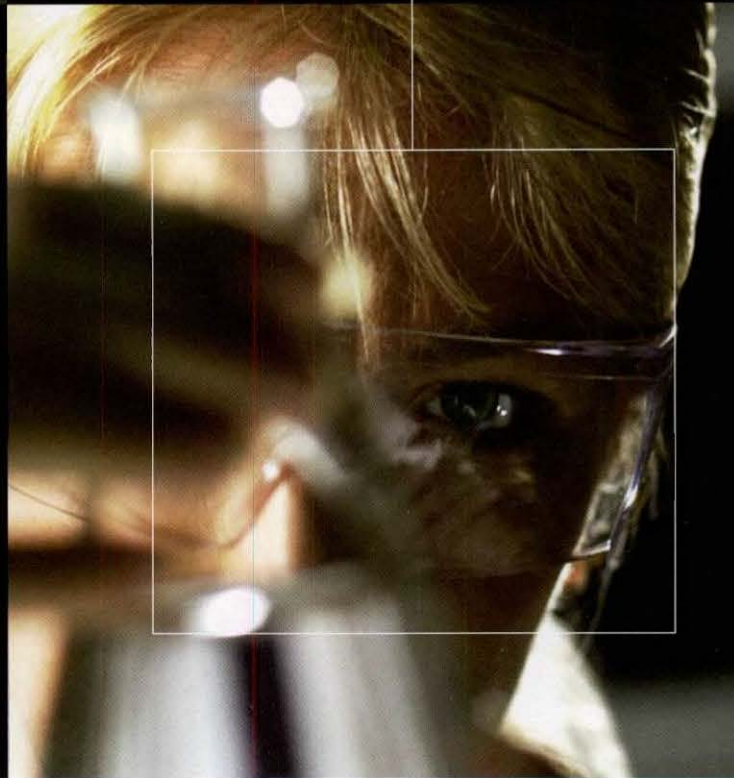


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# Executive Summary

## Collaboration is Key

by E. Lander Medlin

In today's world of both local and global communities, collaboration has become an essential and strategically important ingredient for individual and organizational success. From my perspective, collaboration is key. So what is collaboration anyway? The simplest of definitions states that collaboration is the act of performing work or labor together in the pursuit of a common good or collective end. At its very core, collaboration is not a singular effort but a cooperative venture. So collaboration is first and foremost about relationships.

Therefore, if we are going to build meaningful relationships both individually and organizationally, we must make a commitment to do so in meaningful ways. Making strong commitments to build lasting relationships takes several levels of focused effort to achieve substantial meaning and value.

### Making a Connection

Choosing to get connected with and be an active part of an association is the first step toward becoming more closely related to its members and their collective purpose and values. When you choose to belong to an association through its membership, you have the opportunity to serve others by getting involved. At times, it is easier for us to sit in our offices, surf the Web, but not engage. Engagement takes time and effort. It is a give and take. However, the more you give, the more you get. It is exponential. Yet, you have to avail yourself of the



opportunities by attending educational programs and participating in discussion groups (listservs, small local gatherings, etc.) to make those important connections.

Interestingly enough, New York City is considered the loneliest city in this country even though it is the most populated. For many it feels big and impersonal and, therefore, hard to make personal connections. In order to make association experience more personal, members need to collect in small groups based on needs or degrees of similarity to themselves and the organization they represent. For instance, doctors, lawyers, and judges alike belong to a community of professionals where they not only engage in social activities but learn from each other professionally. Where do you choose to belong? What community of professionals do you most identify with? How engaged are you with its members? Will you choose to engage in its important activities to further your growth and development?

Organizationally, APPA has spent much time and effort connecting with other associations, organizations, and agencies in an effort to: provide depth and breadth to the facilities manage-

ment profession; improve the facilities management profession as an industry; maximize and further leverage our collective resources; and increase our understanding of the education arena. By combining our efforts and resources, we can achieve things collectively that we cannot accomplish individually.

### Learning to Share

Frankly, it is difficult, if not impossible, to develop relationships without meeting together and sharing our experiences and perspectives. We learn more from one another than by ourselves. It is wise to learn from the experiences of other people, because you just do not have time to make all the mistakes yourself. If everything you learn in life you have to learn personally by trial and error, you are going to go through a lot of problems unnecessarily. More importantly, you do not have time to learn everything you need to know on your own. Conversely, meeting regularly and sharing your experiences, successes, and failures adds to the richness of your network immeasurably. The added benefit is that it is an excellent way to get to know one another better. The

*Lander Medlin is APPA's executive vice president. She can be reached at [lander@appa.org](mailto:lander@appa.org).*

wealth gained for all concerned is, again, phenomenal. Think of the wealth of knowledge that exists across our institutions and how much we could learn from each other if we would just avail ourselves of the opportunity. APPA's Effective & Innovative Practices awards is a terrific example of one way to share (and potentially benefit financially) your organization's best practices. We were not meant to face our problems alone. Let us be there to encourage one another. "When you share a joy, it is doubled; when you share a problem, it is cut in half."

### Doing Your Part; Partners Working Together

We each have gifts and talents that, if given back in service to others, will help everyone grow and ensure the health and vitality of the profession and the association as well. For example, taking responsibility to serve on a Facilities Management Evaluation Program (FMEP) team, working on a research project through the Center for Facilities Research (CFaR), or joining a committee or task force in your interest area are just a few ways to give back to improve the facilities management profession and the education community.

APPAs strategic alliance partners are a good example of partners working together toward mutually beneficial goals for the advancement of the profession and higher education as an industry. I cannot think of a better example than the 2006 Joint APPA, NACUBO, SCUP annual meeting titled, "The Campus of the Future: A Meeting of the Minds," to illustrate mutual benefit and collective gain.

In addition, we are forging strong partnerships with our business partners to build higher levels of understanding and involvement with them and through them. Our newest designation, Strategic Business Partner, is the culmination of a significant investment of time and energy. Its importance to all of us is priceless.

Choosing to get connected with and be an active part of an association is the first step toward becoming more closely related to its members and their collective purpose and values.

### Expressing Care and Concern for Others

You see, life is not about all your accomplishments. Ultimately these things are temporal. Life is really about relationships. They last forever. Are you genuinely interested in others—their growth, success, and friendship? Are you sincerely interested in the betterment of the facilities management profession? What decisions are you making and what actions are you taking daily to build strong bonds—lasting, meaningful relationships—with your colleagues in the profession? How devoted are you to making our campuses a better place to work and live? This is a level of "kinship" that can only be forged over time through your words, your actions, and your active engagement.

Remember, these places are not only where we work, but where we live, and they have become a significant part of our lives. There needs to be joy, happiness, reward, and satisfaction as a result. Some of the strongest bonds of friendship in my life have come from this cadre of colleagues. My life would be impoverished without them.

It is my hope that as you become more aware of the importance of relationships, you will make the commitment to engage in and take advantage of the opportunities available through membership involvement and participation. You don't need impressive credentials; you don't need huge responsibilities and budgets; you don't have to come from a large research university; and you don't need a representative or sponsor. You just need an interest in and willingness to engage in the wealth of

knowledge and opportunity available in this collaborative adventure we call APPA. 🏠

### Steps to Building Lasting Relationships

- Make the commitment to connect with an association family—either local, state, regional, national, or international.
- Share with and learn from others—you can learn from an association family of any size.
- Contribute to the profession—everyone has something to give.
- Show your colleagues how much your concern for them.

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# Membership Matters

## How You Can Help Your Association

by Robert J. Carter

Ever wonder why you are an APPA member? No, this is not a trick question. You may be surprised to learn that there are some members who may not know the answer to that question.

There are innumerable organizations in today's society that consist of individuals, companies, business professionals, and other groups of like-minded individuals. Why? Simply put, by pooling our knowledge, skills, and experience with other members of APPA we can significantly enhance our ability to carry out our job responsibilities. Two old adages come to mind—two heads are better than one (a.k.a. teamwork) and don't re-invent the wheel. I like to think of APPA as a cooperative in which members pool their dues and level of participation to create an extensive knowledge base, educational programs, and management tools that are second to none and that add value to your membership.

One of the excellent tools that APPA has developed for the membership includes the staffing guidelines trilogy (*Custodial Staffing Guidelines for Educational Facilities*, *Maintenance Staffing Guidelines for Educational Facilities*, and *Operational Guidelines for Grounds Management*). I have personally used these publications (at a former university) to measure the present level of service provided and target an improved level of service. This resulted in a savings of millions of dollars in operating funds for our facilities operation

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**Robert Carter is the executive director of physical resources at the University of Guelph, Guelph, Ontario, Canada, and APPA's Secretary-Treasurer. He can be reached at [bcarter@pr.uoguelph.ca](mailto:bcarter@pr.uoguelph.ca).**



over a four-year planning horizon. Do you think that being a member of APPA was good value for my institution and for me personally? Purely on a financial basis (and that is not the only way to measure it), the return on our investment as a member of APPA was astronomical.

Other tools provided by APPA are its excellent educational programs such as the Institute for Facilities Management and the Leadership Academy. These programs are so well respected that several outside organizations in the facilities business want to participate. These programs are invaluable not only in the content they offer but in making contacts for future networking among your peers.

These and other APPA programs and services would not be possible without the financial and human resources provided by our members. It stands to reason then, that our strength as an organization stems from having a solid membership base that is committed to the goal of becoming a Global Partner in Learning for our profession and "supporting educational excellence with quality leadership and professional management through education, research,

and recognition." In the past few years, we have seen a slight decline in our institutional membership. A continuation of this trend would reduce our resources of people and funding, both of which are needed to carry out our mission.

What can be done to encourage members to remain members and to introduce nonmembers to the advantages of being an APPA member? First of all, I must put in a plug for the motivated and enthusiastic APPA staff who have developed several membership recruitment programs including the Top Fifty, Community College, and Member-Get-a-Member campaigns. As members, we all believe in APPA and would like to see membership and member involvement increase, but what commitment have you made to personally increase membership and your level of involvement? Take this brief quiz to determine what you can do to foster increased membership. Respond to each statement with "often," "sometimes," or "rarely" to denote how frequently you practice the following:

- I telephone prospective members who come to my attention and invite them to become involved in APPA.
- I offer to share APPA publications such as *Facilities Manager* magazine with prospective members.
- I make sure that new members receive thanks and recognition from our region.
- I bring prospective members to chapter meetings.
- I keep membership materials convenient and distribute them whenever the opportunity arises.
- I educate prospective members about the benefits and services provided by APPA.

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- Refer them to [www.appa.org/newmember](http://www.appa.org/newmember) where they can download the membership application.
- Send the contact information to APPA Member Services (703-684-1446, [randel@appa.org](mailto:randel@appa.org)). We will send them an application and membership materials.

If a nonmember joins APPA before mid-June 2004, you will win a copy of APPA's *Planning and Managing the Campus Facilities Portfolio* and a fully-paid registration to the Forum in Washington, D.C., July 25-27, 2004.

It stands to reason then, that our strength as an organization stems from having a solid membership base that is committed to the goal of becoming a "global partner in learning for our profession" and "supporting educational excellence with quality leadership and professional management through education, research, and recognition."

- I offer ideas and advice on recruitment and retention to the APPA or Regional Membership Committee.
  - I offer my own informal orientation to the members that I recruit.
  - I introduce new members and prospective members at meetings.
  - I maintain contact with new members. When I find a member who has leadership potential, I act as his or her mentor and encourage them to become personally involved in APPA leadership.
  - I ask the advice of new and prospective members on facilities issues.
- I forward information on successful membership development activities of other organizations to my Regional Membership Committee or to the APPA Membership Committee.
- If you put just six of these activities into practice on a regular basis, you will be helping APPA remain the organization of choice for facilities professionals.
- This quiz is adapted from the website of Scouts Canada—[www.scouts.ca](http://www.scouts.ca).*

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**Questions?**

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## Open Systems in the Contracting World

by Ron Bernstein

### Open procurement

### Flexibility

### Future proofing

### Sustainable design

These are the most sought after benefits when facilities managers are investigating options for new projects. Out are the stand-alone, sole-sourced, locked-in systems designs and in are the open systems, multi-vendor, fully integrated, and fair bid contracts of today. More consulting engineers are embracing this concept based upon the demands of the procurement offices. No more long-term service contracts by the sole-sourced vendor of the system. Facility managers just cannot afford this avenue any more. Each step along the way needs to be open bid—from the initial engineering effort to the initial system contract to the service contract. Multiple bidders are required in order to keep the costs in line.

So, how are facility managers dealing with this process? For the most part, not very well. There are several key factors involved in orchestrating a successful multi-phase, multi-building, and multi-bid campus project. In order to achieve these benefits, a master plan has to be identified for the campus that includes the short-term and long-term design criteria and procurement methods. The current method of contracting building projects has to be adapted to the master plan of the campus.

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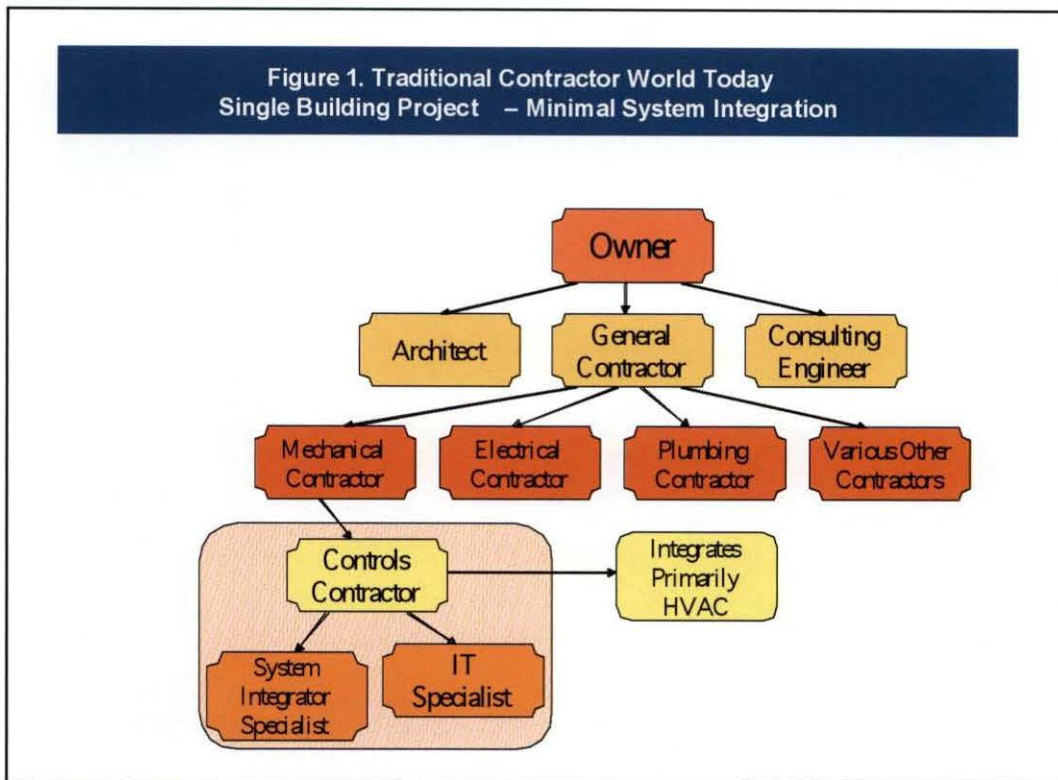
*Ron Bernstein is the channel manager-Americas at Echelon Corporation, Encinitas, California. He can be reached at [rbernstein@echelon.com](mailto:rbernstein@echelon.com). This is his first article for Facilities Manager and is adapted from his forthcoming presentation at the APPA Forum in Washington, D.C.*

Let's look at the way buildings are bid and built now. Figure 1 shows the typical contracting process.

The owner decides to fund a project on the campus and hires a consulting engineer, architect, and general contractor. The architect designs the structure, the engineer designs the systems going into the structure, and the general contractor takes the responsibility of building the building. He hires the subcontractors: mechanical, electrical, plumbing, etc. These subcontractors provide the product, labor, and installation of the systems in the building according to the specifications provided by the consulting engineer. Very often the mechanical contractor hires a controls subcontractor to do the integration of the mechanical systems in the building. This controls contractor has the ultimate responsibility of how the systems in the building function and, although they are the lowest on the totem pole, often the controls contractor has the most to win or lose on the project. They get the hot and cold calls. They also take on the integration of the various pieces in the building, often directly interfacing with the campus Ethernet system and the campus IT department.

Since the mechanical contractor is primarily interested in the HVAC systems, his or her part of the contract focuses solely on this aspect of the facility. Rarely will you see a mechanical contractor hiring a subcontractor to integrate lighting, energy metering, or security systems into the building automation system. This is primarily due to the method that the Construction Specification Institute's Master Spec ([www.csinet.org](http://www.csinet.org)) lays out the different divisions of labor. More recently the concept of a Division 17 design that captures the integration of the various control systems has been promoted. But the contracting world has been reluctant to adopt this strategy due to the traditional contracting model. Organizations such as LonMark International have developed standard specifications to take advantage of open systems technologies and that can be used as a master guide for consulting engineers ([www.lonmark.org](http://www.lonmark.org)).

**Figure 1. Traditional Contractor World Today  
Single Building Project – Minimal System Integration**



The problem becomes that there is no one entity responsible for integrating all the systems in the building, not to mention integration of a single building system into a campus or enterprise-wide control strategy. The door is opened for too much “finger pointing” when it comes to system commissioning. By adopting an open systems standard, the opportunity for finger pointing is dramatically reduced.

The building contracting world lives in a relatively closed environment of single project scope and low bid. Without a master plan, the benefits of integration and open systems cannot be fully achieved.

So how do we change the model? What are the objectives? Well, we want better integration; we want open procurement; and we want long-term sustainability. This translates into:

1. Cross discipline system integration—integrating HVAC, lighting, energy management, security, access, fire, life safety, etc., into one common system architecture.
2. Sustainable design—taking into account the campus/enterprise backbone, long-term integration, maintenance, and operational service contracts.
3. Common methods of communication and integration to reduce maintenance staff training—using the existing campus Ethernet backbone.

Figure 2 shows how this model changes as we have a different view of the campus contract process.

Enter the system integration (SI) contractor/consultant who is responsible for setting up the best practices, advising on the campus master plan, and making sure specifications are put in place and enforced to ensure the benefits are

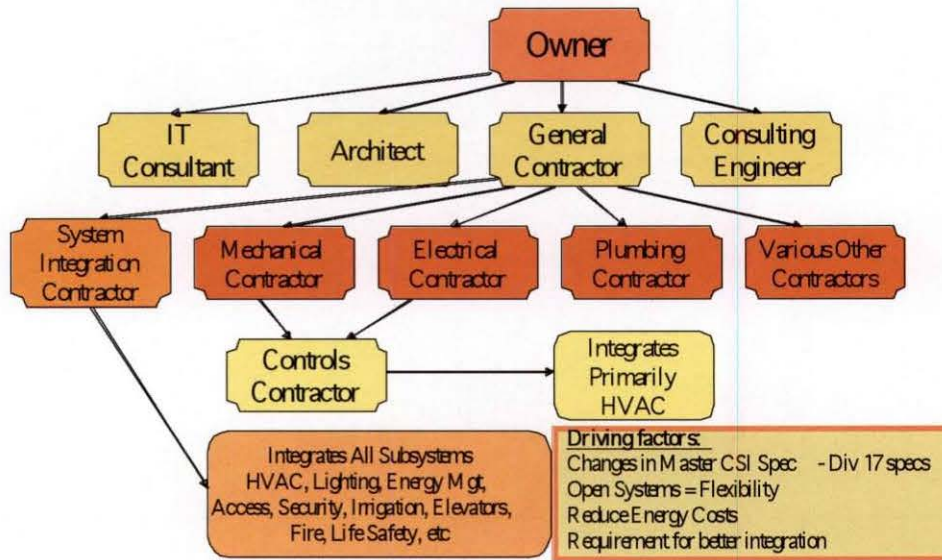
achieved. Similar to the IT consultant who designs the campus data network, backbone, and systems, the SI contractor focuses on the control systems, graphical user interfaces, and common databases for the subsystems, communications protocols, and system architectures for all new projects. Very often the SI contractor consults directly with the campus IT group that deals with issues such as security, scalability, and energy management—ensuring that the objectives for all new building systems are met.

**The problem becomes that there is no one entity responsible for integrating all the systems in the building, not to mention integration of a single building system into a campus or enterprise-wide control strategy.**

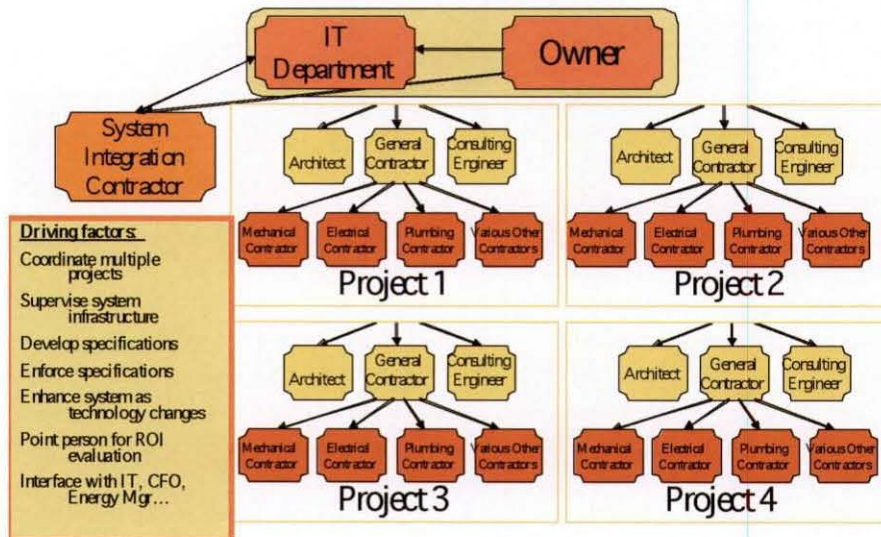
As we expand the contracting process into more than a single building, we see in Figure 3 that the SI contractor takes on a larger role—a coordination effort between multiple project designs, multiple consulting engineers, architects, and general contractors.

In the IT world we would never think of putting in a separate network just for e-mail, another for accounting, or another for administration. The costs would be prohibitive today, yet this is exactly how it was done a few decades ago. Today, the IT world has evolved where common backbone architectures dictate how the various subsystems will integrate, not the other way around.

**Figure 2. The Changing Contractor World  
Typical System – Single Building – Enhanced System Integration**



**Figure 3. The Changing Contractor World  
Open Systems Changes the Model – Multi-Premise**

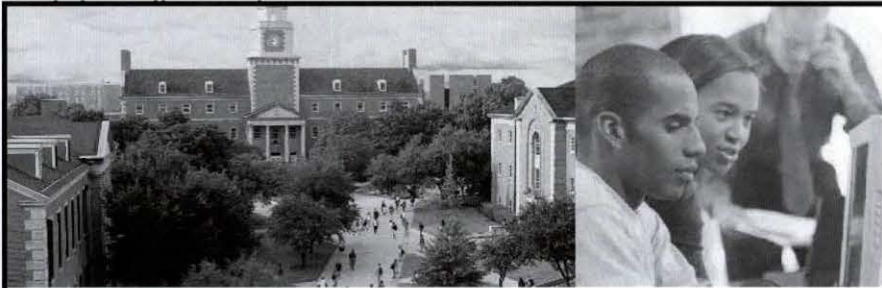


Start with a master plan and develop the best practices and objectives for both short-term and long-term integration; then develop the specification standards around this plan.

In the automated building world, we must design a common architecture for the subsystems and follow the IT model as much as possible. In order for that to happen, there needs to be a coordinated effort and standards developed for the campus that are delivered to each design engineer. The SI contractor takes on this responsibility and works directly with the owner to ensure the use of open systems, open procurement, and fair competitive bidding practices. The SI contractor should also be responsible for the design and implementation of the graphical user interface of the system, ensuring a common look and feel for all of the various buildings and systems. Web browser technology enables the SI contractor to accomplish this quite nicely with no one system being locked into a sole-sourced vendor's user interface. Standard databases of devices, interfaces, routers, and controllers, etc., can be designed and include naming conventions, alarm-

ing standards, scheduling methods, and trend analyses. Once all the subsystems have a common backbone to communicate over and a standard set of design criteria established, achieving the full campus integration objectives can more easily be met.

So to recap, start with a master plan and develop the best practices and objectives for both short-term and long-term integration; then develop the specification standards around this plan. When hiring a consulting engineer, make sure they understand the objective and that they know how to design the controls strategy to meet the plan. Use the services of a good system integrator to help coordinate full campus integration. Eventually you might find it more practical to bring those functions in house much like many IT departments have done. 🏢



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## Maintaining Employee Health and Regulatory Compliance in Lean Times

by Christopher K. Ahoy and David Ballard

In the past few years, universities in the Midwest and elsewhere, have been under difficult budgetary financial situations due to revenue shortfall in their respective states. Nevertheless, the work of organizational excellence and operational excellence continues in the safety and well-being of its constituents.

The impact of budgetary shortfall and lean times provides an opportunity for the Iowa State University staff to consider how the uses of quality tools can be applied to achieve success. Using some of the total quality management principles, *behavior-based safety and information management can be integrated* with proven strategies, such as the Occupational Safety Hazard Administration's components of an effective safety program, and the hazard control hierarchy to increase safety performance and lower costs.

### Existing Paradigms of Safety Management OSHA Paradigms

OSHA was created over 30 years ago, long before the quality revolution, the inception of behavior-based safety, or current information management technologies. This was a time when laws mandating workplace safety were non-existent and accidents resulted in over 14,000 deaths. Since its conception in 1970, the Occupational Safety and Health Administration has emphasized a hazard control hierarchy (Figure 1) and maintained that an effective safety program must be based on:

- Management leadership and employee participation,
- Hazard identification and assessment,

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*Chris Ahoy is associate vice president for facilities at Iowa State University, Ames, Iowa; he can be reached at [ckahoy@iastate.edu](mailto:ckahoy@iastate.edu). Dave Ballard is safety and training coordinator at Iowa State University, Ames, Iowa and can be reached at [dballard@iastate.edu](mailto:dballard@iastate.edu); this is his first article for Facilities Manager. Adapted from a forthcoming presentation at the APPA Forum in Washington, D.C.*

Figure 1. Hazard Control Hierarchy



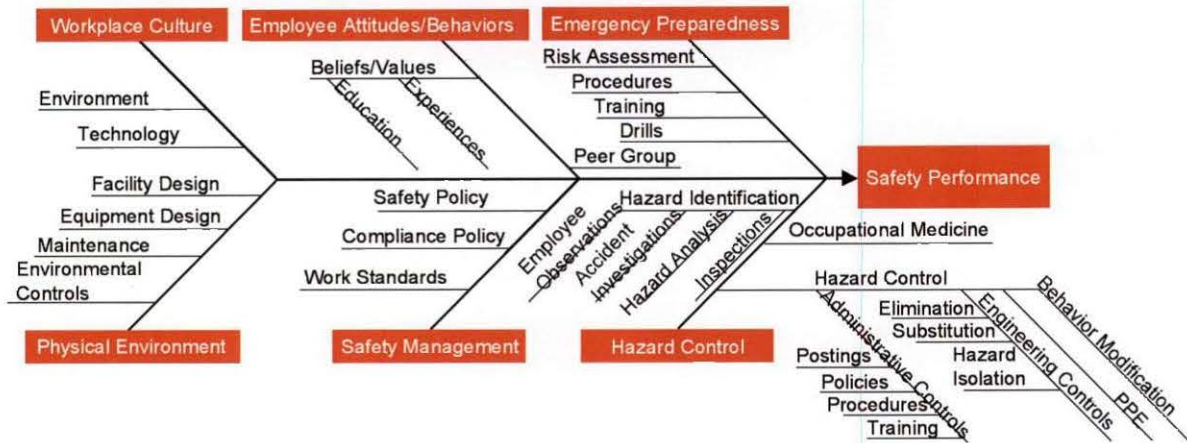
- Hazard prevention and control, and
- Information and training.

In effect, OSHA's strategy is to **make the workplace safer** by eliminating hazards. This strategy underlies all OSHA regulations and it has been effective in reducing workplace-related fatal injuries to 5,524 in 2002. However, this is not the total solution, as it does not address **unsafe behavior**, which is a contributing factor in over 90 percent of all workplace injuries.

### Behavior-Based Safety Paradigm

The mid-1990's research by behavioral psychologist E. Scott Geller, in his book *Psychology of Safety: How to Improve Behaviors and Attitudes on the Job* (1996), resulted in the concept of behavior-based safety. This over-simplification is based on the premise of identifying and modifying risk-taking behaviors **to make employees work safer**. The concept of behavior-based safety is less than ten years old, but in its various forms (e.g., DuPont Stop Program and Safety Performance Solutions, Inc.) it is showing positive results.

Figure 2. Systems Approach to Safety



### TQM Paradigm

Total quality management (TQM) has been around for many years. However, applying systems thinking and continuous process improvement to occupational safety and health is a relatively new concept that has not been widely accepted and applied until recent years.

The major benefit to applying TQM to safety is that **workplace safety is viewed as a system**, with inputs and outputs that are analyzed and continuously improved, rather than a descriptive program. Hazards are considered as system deficiencies that can be corrected using systematic problem solving. This strategy focuses on the identification and correction of root causes, rather than controlling separate hazards. When workplace safety is viewed as a systems approach, effectiveness is measured and expressed as safety performance (Figure 2).

### Knowledge Management Technology Paradigm

Effective knowledge management is essential for ensuring a safe and healthy workplace compliant with applicable regulations. Simply put, knowledge management is the collection and dissemination of pertinent data, information, and knowledge in a timely fashion for the well-being of the entire organization.

Knowledge management is finding the right information, at the right time, for the right process, problems, or issues.

Consider that material safety data sheets (MSDS), accident investigations, employee training, personal exposure monitoring, and lockout/tagout procedures all involve knowledge management. Knowledge management is the glue that binds safety and health-related processes into a fully integrated system. In addition, information technology is the transmitter or the vehicle that deploys such information to members of our organization.

We use knowledge management as one of the six criteria of a Balanced Scorecard Plus to the four Balanced Scorecard criteria: financial, internal process, customer-focus, and learning

and innovation, that were developed by Drs. Kaplan and Norton in 1992. The fifth criterion that we use is information technology. Knowledge must be thought of as a refined form of information. Computers cannot create the knowledge for us; human analysts are required. However, computers play a pivotal role by serving as the repository for data information and by providing tools to facilitate rapid analysis.

Until relatively recently, knowledge management was the most time-consuming and least efficient process in managing workplace safety. The advent of knowledge management technology, such as e-documents, on-line training, and computer-based recordkeeping has made the collection and dissemination of safety and health-related information more effective and cost efficient.

### The Iowa State University FP&M Approach to Safety Management

The facilities planning and management (FP&M) approach to managing workplace safety is not a new paradigm. It is the integration of existing strategies with the additional goal of reducing OSHA recordable injuries and costs as related to labor rates.

The need for a more effective and cost-efficient approach to managing workplace safety became apparent in 2002. In that year, FP&M suffered significant budget reversions and reductions. It became apparent that the organization's approach to workplace safety that emphasized written programs, training, and walk-through inspections conducted by employee safety committees, was ineffective in reducing OSHA recordable injuries. In the same year, university risk management projected that the university user contribution to Iowa worker's compensation self-insurance could increase as much as \$1 million dollars if existing trends continued.

### Systematic Approach

Once the problem was identified, FP&M partnered with the university risk management and environmental health

Figure 3. Safety Management Advisory Group



and safety departments (Figure 3). We applied systematic problem solving to identify, analyze, and correct underlying causes of workplace injuries. The analysis included:

- An audit of all reported injuries to identify who was being injured, and how, why, and when injuries were occurring.
  - An examination of worker's compensation claims to identify cost-reducing opportunities.
  - A review of programs, procedures, and records to identify opportunities for applying knowledge management technologies in an effort to increase the efficiency of the collection and dissemination of safety-related information.
- Based on the analysis, FP&M designed a five-point action plan (listed below) to improve safety performance at a lower cost.

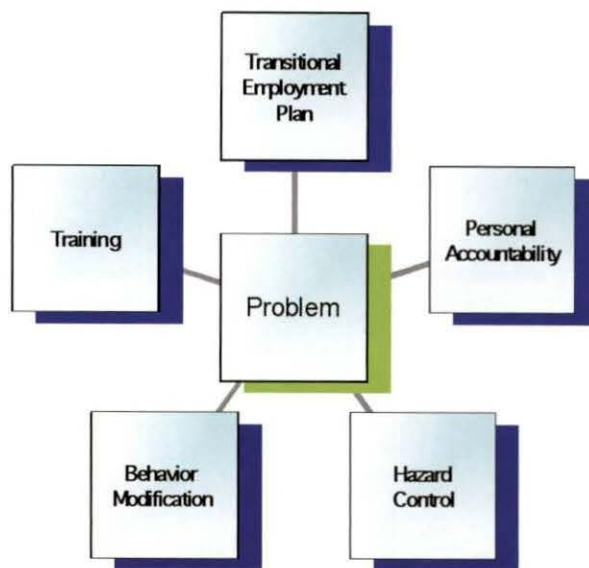
1. Use a systematic situational strategy to mitigate unsafe conditions and behaviors.
2. Hold personnel accountable for compliance with established safety-related policies, procedures, and practices.
3. Develop on-line safety-related training in conjunction with the FP&M Academy, which was in the early stages of design at that time.
4. Place safety-related information on FP&M Web page.
5. Establish a transitional employment plan.

### Systematic Proactive Situational Strategy

In order to focus the resources required to resolve identified problems, FP&M adopted a situational strategy. This was based on the principles of systematic problem solving to identify and correct the underlying causes of hazards and injuries—human, design, environmental, and procedural factors. This strategy has proven successful in reducing the number of sprain and strain injuries incurred by custodians and addressing employees with a long history of injury reporting.

FP&M teamed with environmental health and safety and custodians were observed by an ergonomics specialist while performing routine tasks. The goal was to identify ways the

Figure 4. Situational-Specific Resource Toolbox



work could be performed with less potential for sprain and straining injuries. The resulting information was communicated to custodians.

Approximately 47 percent of injuries reported at FP&M are from employees with a history of injury reporting. Some are recurrent injuries, but most are different types of injuries. To address this problem:

- FP&M is providing counseling, in a caring and compassionate manner, to employees reporting multiple injuries.
- University risk management has placed increased scrutiny on claims filed by employees with a long history of injury reporting.
- University environmental health and safety is performing ergonomic assessments of employees reporting muscular-skeletal injuries.

FP&M continues to use the hazard control hierarchy to mitigate physical, electrical, and chemical hazards with emphasis placed on identifying simple and cost-effective solutions (Figure 4).

The same problem-solving approach is applied to accident investigations. Beginning in 2003, all injuries are investigated by service unit managers. These then are reviewed by the safety coordinator to ensure that human, design, environmental,

#### How Effective Can Enforcement Be?

Consider seatbelts. Before State laws requiring seatbelt usage were enacted, seatbelts were used approximately 17 percent of the time on a voluntary basis. This was low considering the publicity devoted to the need to wear seatbelts. Following the adoption of laws requiring seatbelt usage, compliance rose to more than 60 percent, simply because people wanted to obey the law.

—United States National Fire Administration

Figure 5.



or procedural contributing factors have been identified and addressed.

**Personal Accountability**

In the past, FP&M relied on voluntary compliance with applicable safety-related policies, procedures, and practices because it was doing “things right.” This practice was shown to be ineffective by an analysis of injury occurrences, which showed that employee work practices were a contributing factor in over 90 percent of all injuries. As a result, FP&M has begun to enforce safety-related policies, procedures, and practices through progressive discipline, even when the incident involves an injury. In other words, we moved away from doing “things right” to doing the “right things right.”

**FP&M Academy**

In 2001, FP&M leadership identified a need to modernize training processes into a comprehensive system to develop self-equity and organizational equity. In response to this vision, a nearly paperless computerized network of data and learning resources was developed by FP&M personnel and made accessible to employees in a user-friendly training system (Figure 5).

Key features of the system are:

- Personal training page
- On-line training
- Descriptions of all merit and professional positions
- On-line requests for training and approval of requests by authorized personnel
- Resource library
- Tuition and development grant

- General personnel policies
- Resources for trainers
- External training links
- Automatic documentation of training
- Individual, service unit, and organizational-wide training reports

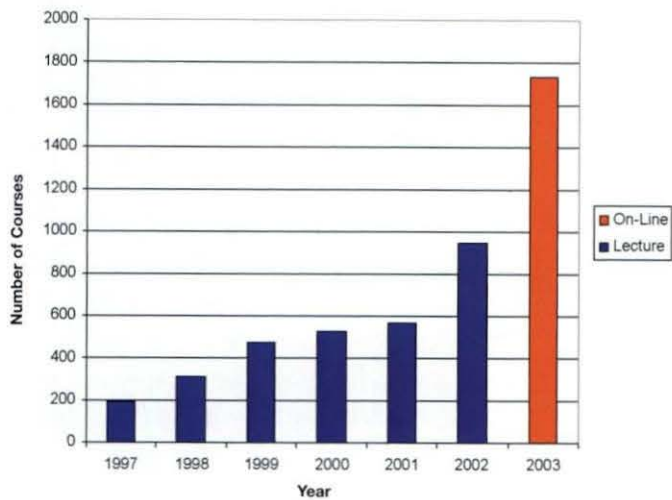
From the onset, effective safety-related training was identified as a requirement for self-equity, organizational equity, and was incorporated into the FP&M Academy. Furthermore, as it was known that mandated training courses were increasing and as a result impacting employee downtime and labor rates, it was decided to develop objective based on-line safety-related training using the four-step instructional technique: motivation, presentation, application, and evaluation.

The advantages to on-line training are that it:

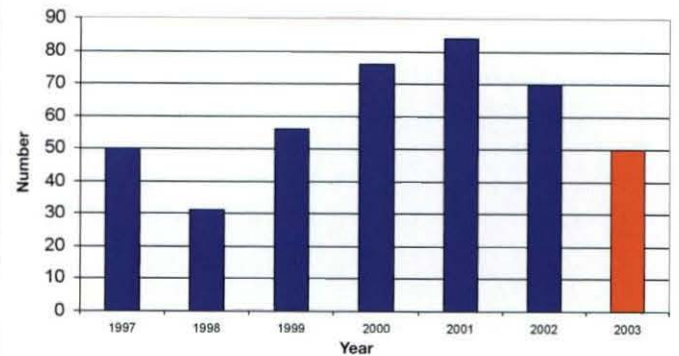
- eliminates scheduling conflicts.
- can be based on needs assessment for each position so employees are only required to complete courses dealing with the hazards for which they are exposed.
- can be designed to include organization-specific information.
- requires less time and resources than lecture presentations.
- is available on-demand and can be accomplished during periods of downtime.

Figure 6. FP&M Web Page

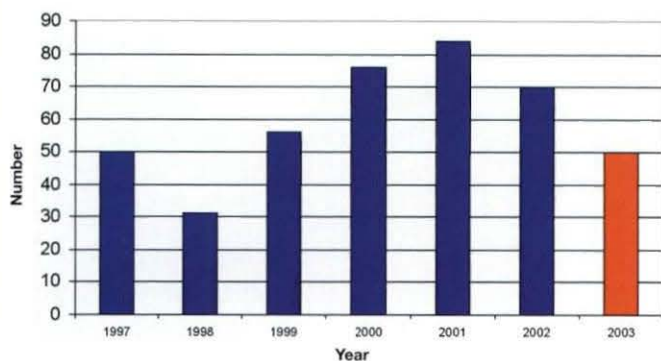
**Figure 7. Safety Courses Completed Per Year**



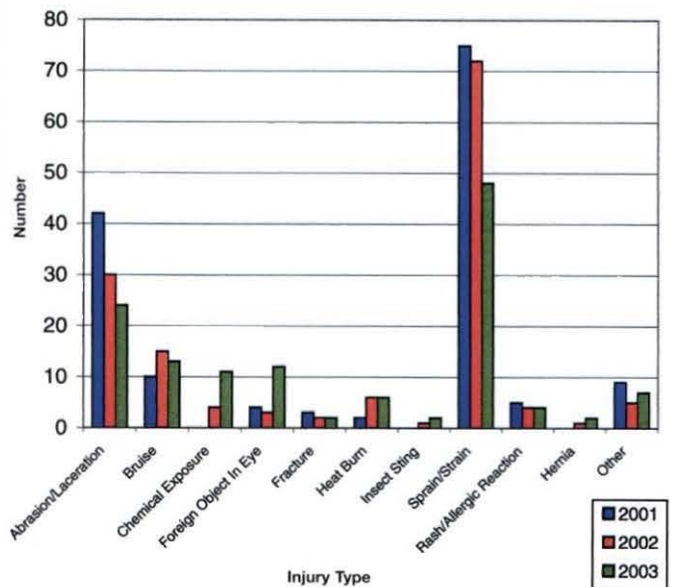
**Figure 9. OSHA Recordable Injuries per Year**



**Figure 8. Cost of Safety-Related Training Downtime per Year**



**Figure 10. All Reported Injuries**



- accommodates computerized documentation of testing and scoring.

To date, FP&M has developed 37 safety-related on-line courses from existing PowerPoint presentation and public domain programs available from the Federal Emergency Management Agency (FEMA), National Fire Administration (NFA), Occupational Safety and Health Administration (OSHA), and National Oceanic and Atmospheric Administration (NOAA).

On-line training has been well received by FP&M employees and their supervisors, and the instant availability of employee training records has facilitated more effective accident investigations.

### Health and Safety for Web Page for FP&M Employees

Through a self-assessment, the FP&M safety coordinator determined that too much time was being spent preparing, distributing, and revising safety-related information. This included written programs, hazard assessments, MSDS, lock-out/tagout procedures, and confined space entry permits. Working with FP&M computer support services, the safety coordinator designed a user-friendly employee safety and health page to communicate required safety and health-related information. As a result, FP&M has a paperless system that is accessible to all personnel. This system allows safety-related documents to be revised and instantly made available. Gone are the days of printing revised pages and lists and inserting them into notebooks located in each service unit. As a result, the safety coordinator has more time to focus on actions hav-

ing a direct impact on employee safety and concerns. This also relieves the safety coordinator from the time-consuming effort of maintaining up-to-date safety-related documents for our staff (Figure 6).

#### **Transitional Employment Plan**

In mid-2003, FP&M teamed with university risk management to pilot a transitional employment plan. The stated purpose of the plan was to help injured employees get back to work and off worker's compensation as soon as feasible

by accommodating work restrictions established by the employee's physician. Transitional employment plans are coordinated by the FP&M human resources professional. Nine employees have participated in the plan since July 2003.

Although exact savings are not currently available, the transitional employment plan has the potential to result in significant savings by reducing wages charged to worker's compensation. This would directly impact the university's user contribution to the Iowa worker's compensation self-insurance.

#### **Results**

Preliminary results of the initiative show a reduction in injuries and an increase in the number of safety courses completed with less down time. In the first year:

- Total injuries decreased by 29 percent and OSHA-reportable injuries decreased by 28 percent. Custodian sprains and strains decreased by a remarkable 52 percent.
- FP&M employees completed 1,735 on-line safety courses at downtime cost of \$4,332, a significant savings over attendance at lecture-delivered courses. In 2002, attendance to 947 lecture delivery courses resulted in a downtime cost of \$44,000 (Figures 7-10).

#### **Conclusion**

In our current organizational environment of learning and teaching, we focus on specific as well as generic training along with development methodologies to increase capabilities of our staffs. Using appropriate learning and teaching tools, leveraging technology in lean times has enhanced the edification of all staff members through painless on-line training. There are now inherent built-in skill sets through development of self-equity that promulgates organization equity. Process improvements with quality initiatives theory and practices have reduced downtime, increased productivity, capabilities, and innate understanding of employee health and regulatory compliance in lean times. This bodes well for an organization aspiring to become the best, namely a world-class operation. 🏰

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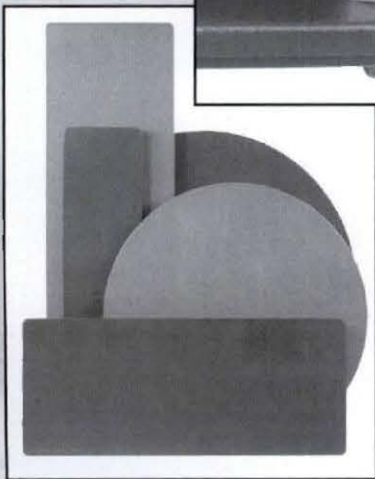
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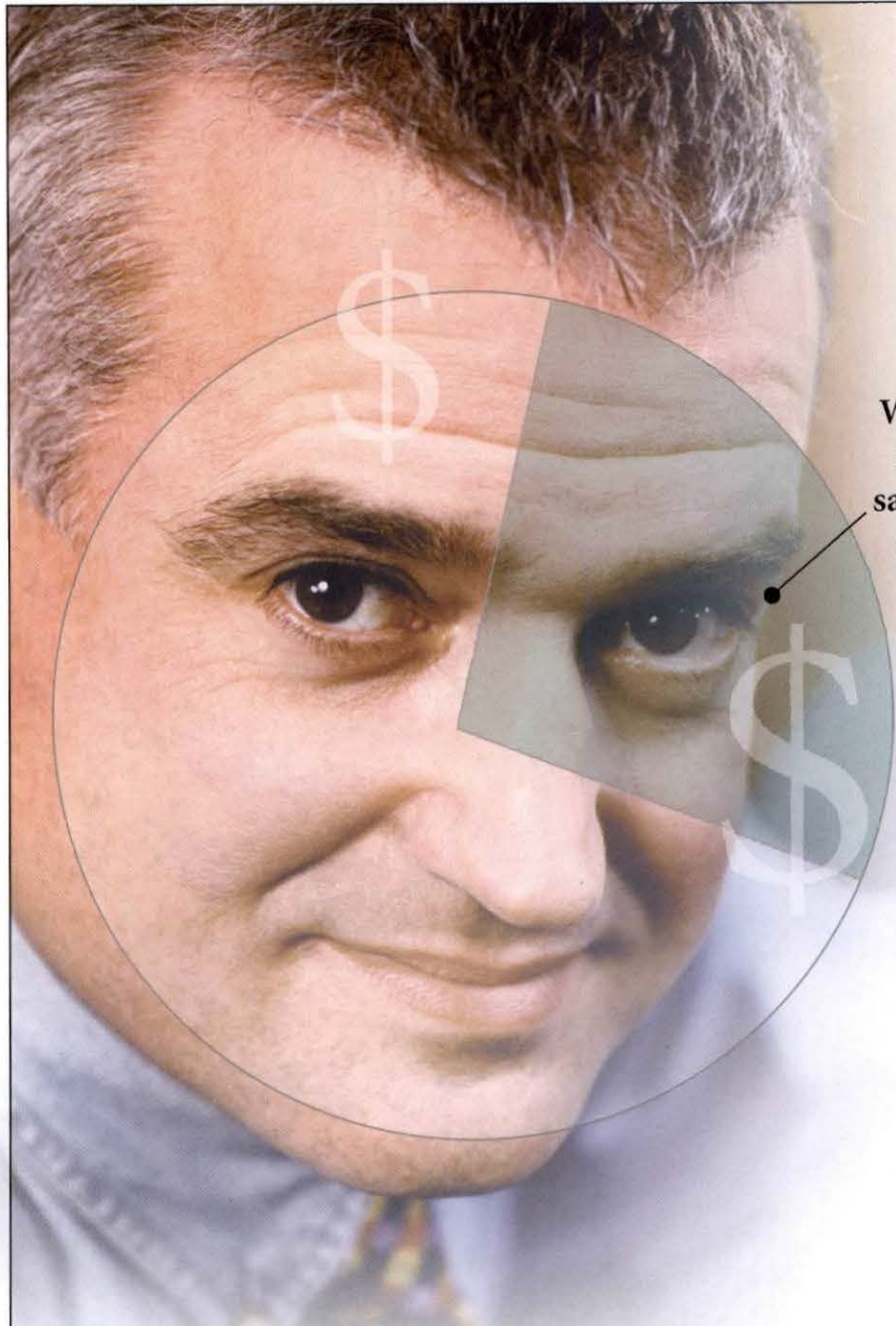
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## Information and Research Committee Shakes Things Up

by Vickie Younger

During the time I have been associated with APPA's Information and Research Committee (formerly called Information Services), I have witnessed changes in the committee name, charge, forms, processes, ideology, and even personnel. This article highlights the most dramatic and exciting change yet—the total revamping of APPA's data collection process!

Our two most well-known survey instruments are CCAS and SAM, with the results published in the biennial *Comparative Costs and Staffing Report for Educational Facilities* and the *Strategic Assessment Model*. Our earliest formal efforts at the CCAS survey occurred in 1965 with the "Unit Cost and Wage Rate Report on Maintenance and Operation of Physical Plants of Universities and Colleges." (And you think our acronyms are bad now!) We have even found some 1928 APPA meeting proceedings that refer to the comparison of the cost of coal and the wages paid to the building watchmen. We have been interested in these figures for a *long* time. SAM is a relative newcomer, conceived in 1995 and first published in 1999, with the focus on measurement of organizational effectiveness through continuous improvement.

Interest in the data and resulting comparisons taken from both surveys have continued to be steady, but participation has been up and down, with overall lower numbers. As we look at statistics, we want stable, consistent results in order to assure the membership that we are actually measuring what we say we are and that the results can be relied upon as both "repeatable" and "consistent." The more participants who complete the surveys with accurate and complete information, the greater value to all.

---

*Vickie Younger is director of facilities resources at Kansas State University in Manhattan, Kansas and vice president of APPA's Information and Research Committee. She can be reached at [vyounger@ksu.edu](mailto:vyounger@ksu.edu). This article is a preview of a presentation scheduled at the APPA Forum in Washington D.C.*

To strive for these results, the Information and Research Committee has gone through a series of modifications to the Comparative Costs and Staffing Survey (CCAS) and the Strategic Assessment Model (SAM). In both cases, we have worked to provide better definitions, refine the way questions are asked, and improve the format and ease of completion. But, even with these modifications we didn't see significant increases in participation. So, we asked the question, "Why?" And, we found that confidentiality, understanding of the process, clarity of definitions, choice of surveys, time, and benefit to the member to be among the barriers.

With the above answers in mind, we decided to take a fresh look and re-think the whole process and then create a new approach that allows for:

- more flexibility,
- more ease and help with the completion process,
- more automated calculations,
- more focus on "what's in it for me,"
- more collaboration with other organizations,
- more support for our new Center for Facilities Research, and
- more outcomes that will assist members in their work.

As you might guess, we had to break away from tradition. Changing a few words or processes would no longer get us to where we needed to be. So we got a clean sheet of paper and asked ourselves, "What do we want to know?" and "How can we get this information?"

### We Have a New Product

We think you will like it. The survey will be done annually. It will be more clear. It will be easier to use. It can be divided among staff members. It will have basic and previously provided information already input. It will be based upon coordinated, clear definitions of terms. It will provide results to you from CCAS, SAM, and other ongoing research efforts. It will have a totally new format. And, most important, it will provide clear *facilities performance indicators*.

As you might guess, we had to break away from tradition. Changing a few words or processes would no longer get us to where we needed to be. So we got a clean sheet of paper and asked ourselves, "What do we want to know?" and "How can we get this information?"

## Modules

Eight modules will be the base for the new data collection process. Each will have basic organizational information already entered (i.e., FICEID, Funding, Carnegie Classification, APPA region, Enrollment Range). Specific information on the person completing the survey element will be asked so that questions can be directed to that responsible person concerning any data points that fall outside expected ranges. Previously submitted information will show up in data fields to give a reference point. The participant may update or leave the information showing as current.

The eight modules are identified as:

- General Data
- Operating Cost Data
- Strategic Financial Data
- Process Data
- Staffing Data
- Customer Satisfaction
- Innovation and Learning
- Process Level Self-Evaluations on Finance, Internal Business, Customer, Innovation and Learning

The beauty of the new format is that it is easy to delegate by sections and does not require a commitment to provide all data. A participant is encouraged to complete as much of the information as they can. The more we have, the more we can feed back to the membership—therefore, the more valuable the results are. Another outstanding feature of this new format is the flexibility to add information to any specific module or to add new modules based upon our needs for research and to answer specific inquiries that APPA regularly receives from the media and other university-affiliated organizations (i.e., NACUBO, CAUBO, SCUP, CUPA-HR).

Samples of the new survey tool are depicted in the figures on the facing page. There may be a little fine tuning before final publication on the Web, but this will certainly give you an idea of how the changes are being introduced.

We are hoping that for the good of your department, your institution, and APPA that you will participate in this new survey. The information that will be collected is necessary and useful for the decision makers at your institution and governing body.

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# APPA Facilities Performance Indicators Surveys

Home  
General Data  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data

## REGISTRATION

This registration is valid for all APPA web-based surveys during the 2003-04 fiscal year. You will use the User Name and Password established with this one-time registration to log into any/all APPA web-based survey modules.

Username:  Please read REGISTRATION instructions first

Username Hint:

Password:  **REGISTRATION Instructions**

Re-type Password:

Password Hint:

Institution:

Data reported for all survey modules through this registration represents:  K-12 school district or individual public/private primary/secondary school

Same Changes Cancel

Registration

# APPA Facilities Performance Indicators Surveys

Home  
Auxiliary Definition  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data

## Section I: GENERAL DATA

This survey references AUXILIARY ENTERPRISES in many definitions. Auxiliary enterprises are defined as activities that normally are self-supporting from cash sales/billings versus activities that are allocated budgets. Examples are parking that sells permits and receives income from fines and meters; residence halls, housing and food services that sell room and board to students, and have cash food sales; bookstores, movie theatres, athletics receiving income from sports events ticket sales. The campus accounting or budget office normally can provide a list of auxiliary enterprises.

Definitions in the General Data Module instruct you when to include auxiliary services in entries for this module.

Person to contact regarding General Data Module entries:

Name:

Telephone Number:

Fax Number:

Email address:

Entries you are making in this General Data module will be used for all APPA 2003-04 surveys in which you participate.

General Data

# APPA Facilities Performance Indicators Surveys

Home  
General Data  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data  
Personnel Data  
Auxiliary Definition

## Section II: FINANCIAL DATA OPERATING COSTS

Person to contact regarding Operating Costs Module entries:

Name:

Telephone Number:

Fax Number:

Email address:

Statistics reported in this Operating Costs data module (unless otherwise instructed by a definition):  Include auxiliary services

TOTAL ADMINISTRATION/MANAGEMENT COSTS\* FY 2003-04

Total GSF for which department performs specific function in this category:

Total in-house labor costs (including salaries, wages, benefits):

Total in-house non-labor costs (including supplies, equipment, training, etc.):

Total costs for contracted services:

Grand Total Preliminary cost/GSF:

A \* in an entry title indicates that there is an expanded definition for your examination. Double click on the title to read the expanded definition.

Operating Costs

# APPA Facilities Performance Indicators Surveys

Home  
General Data  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data  
Personnel Data  
Auxiliary Definition

## Section II: FINANCIAL DATA STRATEGIC FINANCIAL MEASURES

Gross institutional expenditures\*:

Annual Capital Renewal Expenditures\*:

Deferred Capital Maintenance Backlog\*:

Capital renewal cumulative need\*:

Renovation, modernization, and adaptation annual expenditure\*:

Renovation, modernization, and adaptation cumulative need\*:

Capital expenditures for major building renovations during the 2003-04 fiscal year\*:

A \* in an entry title indicates that there is an expanded definition for your examination. Double click on the title to read the expanded definition.

Financial Measures

# APPA Facilities Performance Indicators Surveys

Home  
General Data  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data  
Personnel Data  
Auxiliary Definition

## Section V: CUSTOMER SATISFACTION DATA

Customer Satisfaction Results: If your organization assessed the satisfaction level of its customers in FY 2003-04 using a numerically calibrated survey instrument, please indicate the following results:

Overall Average Customer Satisfaction Index\*:  Very Satisfied

Distribution Index\*: Indicate the percent of customers whose overall scores averages were in the following ranges. The total of the entries must equal 100%.

Extremely Satisfied:  %

Very Satisfied:  %

Satisfied:  %

Very Dissatisfied:  %

Extremely Dissatisfied:  %

Total:  %

Double click on job function to read the definition for the position.

Customer Satisfaction

# APPA Facilities Performance Indicators Surveys

Home  
General Data  
Financial Data  
Business Process Data  
Innovation/Learning Data  
Customer Data  
Personnel Data  
Auxiliary Definition

## Section VI: PERSONNEL DATA AND COSTS

TRADES	Number FTE Employees	Union Yes/No	Average Annual Salary
Shop Supervisor/Foreman	<input type="text"/>	No	\$ <input type="text"/>
Carpenter	<input type="text"/>	No	\$ <input type="text"/>
Electrician	<input type="text"/>	No	\$ <input type="text"/>
Locksmith	<input type="text"/>	No	\$ <input type="text"/>
Machinist/Welder	<input type="text"/>	No	\$ <input type="text"/>
AC/Refrigeration	<input type="text"/>	No	\$ <input type="text"/>
Mason	<input type="text"/>	No	\$ <input type="text"/>
Painter	<input type="text"/>	No	\$ <input type="text"/>
Plumber/Pipefitter	<input type="text"/>	No	\$ <input type="text"/>
Roofer	<input type="text"/>	No	\$ <input type="text"/>
Sheetmetal Worker	<input type="text"/>	No	\$ <input type="text"/>

Personnel Data and Costs

The beauty of the new format is that it is easy to delegate by sections and does not require a commitment to provide all data.

You can see by the following comments that others are finding this information to be critical in their decision making and for presentations for support of their organizations efforts.

### Why You Need This Data

- If you don't know where you are going, any road will get you there.
- Improvement or decline is only determined relative to a base line.
- Data collection and presentation adds credibility to the member.
- Data collection helps the facilities professional tell his story to campus decision makers.
- Information helps to assess the organization's financial performance.
- It's necessary to determine the readiness of employees to embrace the future.
- Data collection helps to determine our ability to delight customers.

### How You Can Use the Data

- I use these tools for self analysis; the more data the more valid.
- I use the data to make my case for budget requests and to help depict what impact budget cuts might cause.
- I use the data in conversations concerning reasonable expectations with senior administrators and the Board of Directors.
- I use the data to see what would happen if our organization decides to shrink or grow.
- I have gone to specific publications that result from data collection to help with staffing for our grounds department as we anticipate increases in the landscaped area of our University. We were able to increase our FTEs by two staff members and dedicate an additional \$50,000.

We will be offering a hands-on training session at the Educational Leadership Facilities Forum in Washington, D.C. in July to demonstrate this new survey tool and answer any questions that you may have on how to complete the information and how these tools might be of greatest value to you for planning and benchmarking. Please join the Information and Research Committee on Tuesday, July 27, 2004, from 9:00 a.m. to 10:15 a.m. for this session. It will definitely be worth your time! 🏠

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# What is Current Replacement Value and Why Should You Care?



by Theodore J. Weidner, Ph.D., P.E., AIA

In the search for metrics to compare campuses for operational efficiency, physical condition, and other factors of importance, chief financial and facility officers have developed ratios based on the current replacement value (CRV) of the constructed vertical (buildings) and horizontal (roads, utilities, and grounds) infrastructure of a campus. CRV is an essential element of the facility condition index (FCI), the needs index (NI),<sup>1</sup> and other measures of institutional commitment to facilities.<sup>2</sup> CRV is an element in annual reports describing campus assets and can also be used to predict costs of future expansion of the campus for fund-raising efforts or for academic and financial planning. Getting the CRV wrong means that the FCI and other ratios will be wrong, plans will not be tied well to budgets, and your credibility with faculty, trustees, or executives will drop. Getting the CRV right improves your chances to get the next new project or campus rehabilitation approved.

Current replacement value is defined as “the actual cost of replacing the facilities...not the book value”<sup>3</sup> and “the total expenditure in current dollars required to replace a facility...[to] meet current acceptable standards of construction

and comply with regulatory requirements.”<sup>4</sup> Despite that clarity, knowledgeable people provide varying responses often in conflict with the above definitions; the chief financial officer may provide a book value while the chief facilities officer may answer differently. Defining CRV seems to have more to do with what makes sense to the facilities and financial officers, making the campus more or less valuable depending on their interest or organizational needs.

However, given that the physical infrastructure of a campus likely has greater replacement value than the endowment<sup>5</sup> (which has fairly clear rules and definitions for valuation), it seems irresponsible to have a relaxed attitude about the definition of the current replacement value of campus facilities. Too often the importance of a consistent CRV is diminished; it changes every year because construction costs change. Consistency is important for benchmarking. This article presents the rationale supporting a consistent definition of and methods to determine an appropriate current replacement value. It looks at standard real estate valuation techniques, national data sources, and common errors. Lastly, some practical techniques and examples are included.

## Consistency

Both definitions of CRV provided above focus on replacing a facility as currently used. A building constructed for \$100/gsf (inflation adjusted) may be used in a way where it cannot be replaced for less than \$200/gsf. The definitions say

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**Ted Weidner is president of Facility Asset Consulting, Amherst, Massachusetts. He can be reached at [ted@weidnerfac.com](mailto:ted@weidnerfac.com).**

Defining CRV seems to have more to do with what makes sense to the facilities and financial officers, making the campus more or less valuable depending on their interest or organizational needs.

the facility is valued at \$200/gsf; the cost to replace it. In another case, older buildings that have been grandfathered by the building code (they met the building code when constructed but now don't meet the current code) can only be replaced if they meet the newer, more stringent code requirements. Since they can't be replaced with a non-code compliant building, they should be valued as if they were code compliant. Thus, a multi-story building without an elevator should be valued as if it has one or more elevators (depending on the code or needs). However, a campus that has made the commitment to increase faculty office sizes from 100 sf to 150 sf should not increase the value of its facilities for that reason.<sup>6</sup> These are examples where CFOs (both financial and facilities) may incorrectly estimate CRV. This concept may be a big leap but it is important to accept.

Knowing how the building is used and what it would cost to replace can be a mechanical exercise with varying levels of complexity and accuracy. Normalized values, cost per gross square foot, are used to facilitate the calculations. But how is the correct normalized value determined?

## Real Estate Appraisal

Real estate appraisers use three methods to arrive at the value of a facility and/or the land it is situated on. These methods are called the income, comparable, and cost approaches.

Most real estate is valued for commercial (and tax) purposes and therefore the value is partly based on the income it can derive. Because most universities are nonprofit entities, an excuse can be made to avoid taking the first approach (income method) to value campus facilities. (Note: The income approach may be considered, but it requires analysis of the income from instruction and research that are too controversial to be handled here. See articles by Jacquin<sup>7</sup> and Winston.<sup>8</sup>) This discussion will ignore the income approach and focus on the comparable and cost methods.

To determine the value of a campus building through the comparable method, one would identify similar facilities that have changed ownership recently. This is usually done by investigating real estate transactions in county offices or in business publications. Adjustments are made for differences in size, physical features, amenities, etc., and a valuation is

set. The three most important factors in the comparable approach are "location, location, location." This works two ways when valuing higher education facilities.

Colleges and universities have a fundamental challenge in that they are usually tied to a given site or campus. Your campus brochure probably mentions how the campus is located in the beautiful town of X and emphasizes proximity to cultural and recreational activities; in large cities the emphasis may be on access to the campus for after-work degree programs and other continuing education opportunities. However, real estate transactions involving a building similar to a college building (classrooms, laboratories, etc.) are rare. More generic buildings may have comparable value when appropriate adjustments are made for renovation of the building to college purposes but such examples involve the cost method (which is explained below). Land transactions are more typical, but even here they may be driven by the college and result in distorted comparisons.<sup>9</sup>

Having omitted the income and comparable approaches, the cost approach becomes the remaining method of valuing higher education facilities. This method focuses on the cost to construct the facility as the basis for valuation.

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Appraisers utilize one of the major cost estimating books, Means<sup>10</sup> or Whitestone,<sup>11</sup> that provide examples and construction costs per square foot or they may consult a building contractor.

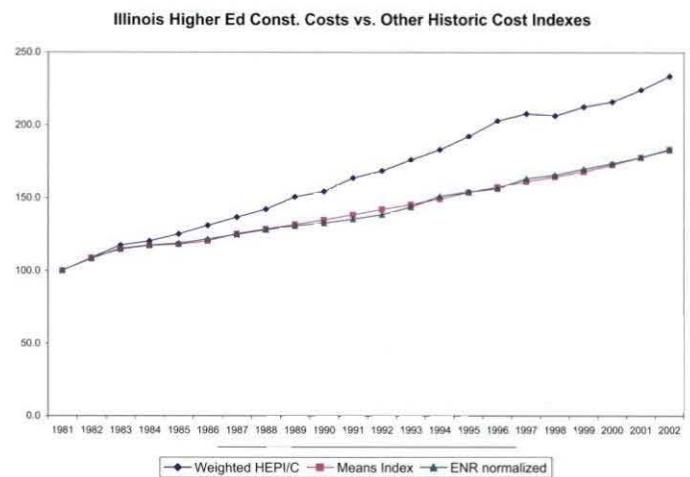
In the cost approach method, details about the building are needed, such as building area, general construction, use, and any important features. Square foot cost estimating methods approximate the value but are not robust enough to address either unique characteristics or customizations that a university may demand<sup>12</sup> or to recognize the added cost for architecturally significant buildings that often find homes on college campuses; the Peter B. Lewis Building designed by Frank Gehry and located at Case Western Reserve University is a recent example.

A modified cost approach is to inflate the original building cost by historic cost indices; however this alternative has flaws. There will be changes in construction techniques and building code requirements (discussed above). Building codes are updated on a three-year cycle and invariably incorporate new safety measures that add to the cost. Fire sprinklers in dormitories may have been optional ten years ago, no more. Twenty years ago, a building might have been constructed without any Internet infrastructure. Forty years ago the building might not have included smoke or fire detectors, only pull stations. It might be argued that it is not appropriate to compare 40-year-old building requirements with current building requirements. But the counter-argument is that professors don't teach in buildings the way they did 40 years ago; they teach in a way that students will learn and become engaged today.<sup>13</sup>

The building valuation must respond to the changing needs for the activities housed within. Figure 1 shows how the Illinois Board of Higher Education has inflated college construction costs over 20 years as compared to other construction cost indexes; apparent college costs have increased by 1.3 percent over the construction indexes. Most members of the college community would be unwilling to work in a building that limited them to 40-year-old building technology and comfort. In reality, facility officers are regularly incorporating new building features. While President James A. Garfield once referred fondly to a well-known professor at Williams College as "The ideal college is Mark Hopkins on one end of a log and a student on the other."<sup>14</sup> Colleges don't look like that today even if the climate would allow it. Most colleges today are acting on the comments of Walter Broadnax, president of Clark Atlanta University who said in a PBS interview "Our dormitories and our classrooms and our instruction has [sic] be to as good as anybody else's, because today's youngsters aren't going to accept anything but the best."<sup>15</sup>

Can a campus keep up with a reasonable estimate of its CRV when the bar is constantly being raised in terms of technical systems, educational methods, and student expectations? Yes. It may require some effort but the tools and

**Figure 1**



information are available. Let's look at the minimum amount of information required and add complexity as appropriate.

### Square Foot Estimating

First, know the size of the campus area in gross square feet of buildings. Use the Means or Whitestone square foot cost data to estimate the value of individual buildings or the entire campus using the general descriptions of buildings and cost ranges; the horizontal infrastructure (sidewalks, parking, and utility distribution) can be estimated at 25 percent of the building value (institutions with little campus-owned infrastructure should reduce this number accordingly). Use the historic cost indexes to make short-term inflationary adjustments. Remember that while the historic cost indexes may cover 50 years or more, building designs have changed so much that pure inflationary adjustments are not appropriate. Campus records of recent new construction costs provide a better resource.

Another approach used for public institutions in Illinois is to have data on net assignable building area (nasf) by 14 different space types. Use the state-supplied construction costs for each space type; there may be some inaccuracies but the advantage is its consistency and state-wide application.

Greater accuracy through the accumulation of building components, quantities, and corresponding installation costs do not add much value. It would be better to maintain costs of campus construction projects and compare normalized data against the national databases to determine what your campus "quality factor" may be. Be sure to include architect and engineering fees and other related construction expenditures since these are part of any building project.

### Summary

Detailed cost estimates, similar to what would be performed as part of a new construction project, may not be necessary to determine CRV. Square-foot based cost estimates can provide reasonable accuracy as long as they focus on current replacement and not replacement of a facility that is no longer current.

Real estate appraisers use three methods to arrive at the value of a facility and/or the land it is situated on. These methods are called the income, comparable, and cost approaches.

### Example 1

A typical campus building is used to illustrate how to determine the current replacement value of a single building or entire campus.

An example building is a three-story, 113,000 gsf (57,684 nasf), classroom building constructed in 1959 for \$2,916,000.

Building cost by type comes from *The Whitestone Building Maintenance and Repair Cost Reference 2003* adjusted for Springfield, Illinois—College classroom \$109.54/gsf.

$$\text{CRV} = \text{gsf} \times \text{cost/gsf}$$

$$\text{CRV} = 113,000 \times \$109.54$$

$$\text{CRV} = \$12,378,020 \text{ (plus factor for horizontal infrastructure)}$$

A clear understanding of the composition of a generic classroom building is essential to make the appropriate adjustments for quality of materials and different components but this is a good start.

Just as the chief financial officer must know the value of the endowment, so too the chief facility officer must know the current replacement value of the campus along with other data that describe the campus condition. Consistent measurement of both the financial endowment and physical infrastructure is essential to present the campus administration as a responsible manager of all resources. Reasonably accurate representations of facility value are easy and can be done with data and materials that most facility officers have at hand. Consistent measures across institutions demonstrate to internal and external constituencies the cost of higher education and the corresponding value of the investment. 🏛️

### Footnotes

1. Cain, David A. and Maggie Kinnaman, "The Needs Index: A New and Improved FCI", *Facilities Manager*, March/April 2004.
2. APPA: The Association of Higher Education Facilities Officers. *The Strategic Assessment Model*. Alexandria, Virginia: APPA 1999 & 2001.

### Example 2

The Illinois Board of Higher Education (IBHE) provides costs by net assignable square feet (nasf) for different use types of buildings (a grossing factor, gsf/nasf, is used to estimate gross area). The data for this building result in:

	nasf	gsf/nasf Factors	gsf	Cost/gsf	Total Cost
Classrooms	26,046	1.5	39,069	\$176.24 =	\$ 6,885,520
Laboratories	3,016	1.67	5,036	\$197.43 =	994,400
Offices	28,185	1.7	47,914	\$182.44 =	8,741,521
General Spaces	437	1.9	830	\$210.66 =	174,907
					\$16,796,348

In the last example, if the IBHE costs are accurate for the campus, then the campus can also develop a quality factor to use against the costs shown in the Means or Whitestone publications. Comparing the two examples, the apparent quality factor is:

$$\text{Campus quality factor} = \$16,796,352 / \$12,378,020 = 1.36$$

This factor can be applied to other campus facilities to adjust for differences.



3. Kaiser, Harvey H, and Jerry S. Davis, *A Foundation to Uphold*, APPA, Alexandria, Virginia: APPA 1996.
4. Ibid, pg 42.
5. A brief study by the author using FY2000 data from APPA's Comparative Cost and Staffing Survey and published endowment values for the same year showed 23 percent of 142 institutions had endowments exceeding an estimated value of campus infrastructure value. All institutions with greater endowments were private. FY2000 was a very good year for endowment values, which have declined since then while construction costs continued to increase.
6. Some might argue that increased office space is a modernization need necessary to attract or retain faculty. The presentation here focuses on building costs per square foot and physical components rather than spatial features. Office size is an independent variable.
7. Jacquin, Jules C., "Revenue and Expense Analysis, An Alternative Method for Analyzing University Operations," *Business Officer*, September 1994.
8. Winston, Gordon C., several papers for the Williams Project in the Economics of Higher Education, found at <http://www.williams.edu/wpehe/>
9. The author has experience where, as part of a campus master plan, local residential property was being acquired as it became available. The typical real estate appraisal identified sale to the university as the appropriate valuation, rather than student rental housing, which resulted in self-reinforcing and increasing acquisition costs.
10. Waier, Phillip R., ed., *Building Construction Cost Data*, 62nd annual edition, Kingston, Massachusetts: R.S. Means, Inc., 2004.
11. Lufkin, Peter S., et al. *The Whitestone Building Maintenance and Repair Cost Reference 2003*, eighth annual edition, Santa Barbara, California, 2003.
12. Kershner, Gene, "Why Do University Buildings Cost So Much?" *Business Officer*, April 1987.
13. Lidsky, Arthur J. "The Ever Changing Campus: Pedagogy, Technology, and Facilities," *Facilities Manager*, March/ April 2004.
14. [http://www.williams.edu/home/about\\_history.php](http://www.williams.edu/home/about_history.php)
15. "Saving Black Colleges," Newshour with Jim Lehrer, February 25, 2004, PBS, Washington, DC.

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# Where Do You Lead From?

*by Frederic J. Gratto*

In a profession as technical as facilities management all the hardware in the world can be a mighty force. Nonetheless, the software of management skill matters more than ever before. My observations about this are pretty simple...leaders have the biggest impact on any organization...employees tend to take on the characteristics of their leader. The world of sports, campus administrations, and facilities organizations provides many examples of people who have rescued teams, turned organizations around, and raised their performance to another level. They are able to do this because leaders set the tone of the workplace by putting a personal stamp on it. "Leadership means setting an example. When you find yourself in a position of leadership, people will follow your every move" (Maxwell 1998). People do follow the leader. In fact, employees ascend or tumble to the level of the leader. Therefore, it is important for leaders in facilities management to consider how their behavior, attitude, and level of job satisfaction impacts the work environment and the performance of the people in it, including themselves.

Only within the past 70 years or so have people begun to be interested in the topic of job satisfaction and its impact on organizations.

Because the leader of a facilities organization impacts everything and everybody in it, I was interested in considering where we lead from...what's our perspective, attitude, disposition? It occurred to me that studying the relationship between organizational climate and job satisfaction for directors of physical plants would reveal important information. As part of my doctoral dissertation, a questionnaire measuring job satisfaction and organizational climate was electronically sent to directors of physical plants who were members of APPA as of July 2001.

*The research posed four questions:*

1. How do directors of physical plants perceive organizational climate at their respective institutions using a set of seven identified factors for climate?
2. Using the same seven climate factors as an index, how satisfied are directors of physical plants with the organizational climate of their respective institutions?

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**Fred Gratto is assistant director of physical plant at the University of Florida, Gainesville, Florida. He can be reached at [fgratto@ufl.edu](mailto:fgratto@ufl.edu). This article is adapted from the author's doctoral dissertation, conducted under the auspices of APPA's Center for Facilities Research.**

3. How important are each of the eight identified job satisfaction variables to physical plant directors in the performance of their specific job responsibilities?
4. For each of the eight job satisfaction variables, is there a significant relationship between measures of job satisfaction and a set of seven measures of satisfaction with organizational climate, as reported by directors of physical plants?

Seven factors about the organizational climate were addressed by the survey instrument. The intent was to see how they related to the eight job satisfaction variables. Definitions for the seven organizational climate factors are shown below.

1. **Internal Communication.** The institution's formal and informal communication processes and styles.
2. **Organizational Structure.** The administrative operation of the institution or its hierarchical lines of authority and requirements for operating within that hierarchy.
3. **Political Climate.** The nature and complexity of the institution's internal politics or the degree to which an employee must operate within a political framework in order to accomplish a task.
4. **Professional Development Opportunities.** The opportunities for employees to pursue and participate in activities to enhance job performance.
5. **Evaluation.** The institution's procedure for evaluation through positive feedback intended to provide professional growth for the employee.
6. **Promotion.** The commitment of the institution to internal promotion and advancement within the organization.
7. **Regard for Personal Concern.** The institution's sensitivity to and regard for the personal concerns and well-being of the employee.

The eight job satisfaction variables used in this study were

- participation in decision making,
- autonomy, power, and control,
- relationship with peers,
- relationship with subordinates,
- relationship with superior,
- salary,
- benefits, and
- professional effectiveness.

Leaders today understand that people are every organization's most important resource. However, this has not always been our perspective...where we have led from. Only within the past 70 years or so have people begun to be interested in the topic of job satisfaction and its impact on organizations.

In the 1930s, when Elton Mayo and his associates observed experiments underway at the Western Electric Hawthorne plant near Chicago, job satisfaction became a popular topic for research because of the unanticipated findings of the study. The experiments were intended to determine the impact of illumination levels on worker productivity. The results were a surprise because they indicated there was no significant relationship between levels of illumination and the productivity of workers (Hersey & Blanchard 1996). This unexpected outcome caused the researchers to conclude that factors other than lighting levels must have affected worker productivity. They identified other variables that impacted productivity more than aspects of the physical environment. Two of these variables were the effect of informal work groups and the attitude of workers about the company. The researchers made two important conclusions. One was that human variability was a significant factor in determining worker productivity. The second one was that norms and expectations among workers had a greater impact on productivity than the work environment (Luenburg & Ornstein 1991).

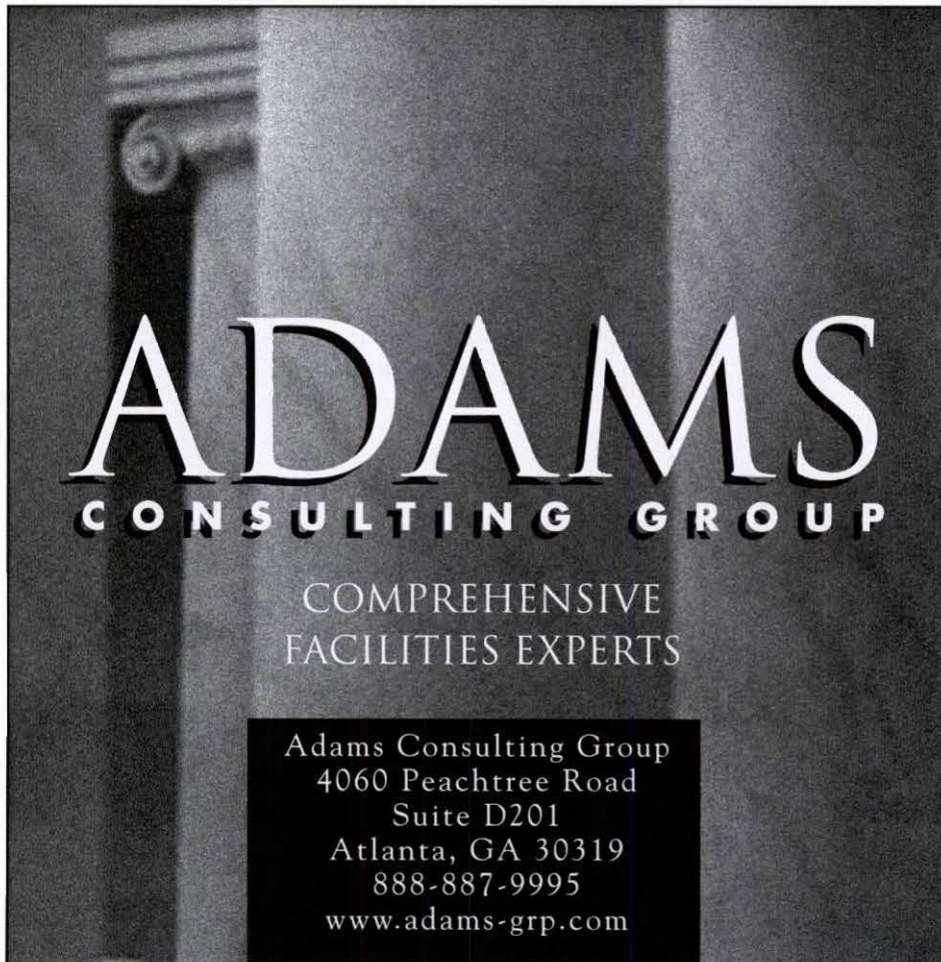
Prior to the Mayo studies, those who studied human relations considered motivation at work to be a rather straightforward matter. A person was either satisfied with his

or her job or not satisfied. But the research of Argyris (1962) led to a more comprehensive way to consider job satisfaction. The study set out to measure how well organizations worked with people rather than with things such as machinery. Studies considered the human climate, which was comprised of variables such as mutual understanding, mutual trust, self-esteem, openness, and internal commitment. Argyris found many factors that influenced job satisfaction. Some of these were administrative leadership, effectiveness of groups, formal organizational structure, and policies and practices. Interpersonal relationships and management's understanding of the social needs of the workers were found to impact factors such as conformity, organizational structure, and job satisfaction.

McMurray (1953) also considered the focus of organizations on things rather than on people during a time when business and industry emphasized production, research, accounting, engineering, sales, and financial matters. Because of the emphasis on these things, management had little interest in humanitarian considerations such as the needs of workers on the job. McMurray observed that while this focus resulted in a wonderful contribution to the national economy and tremendous improvement in the American standard of living, it came at a high cost to human well-being on the job.

McMurray concluded that many of the frictions and conflicts that plagued organizations could be attributed to the extent to which management was insensitive to the needs, problems, and anxieties of the people with whom they worked.

Similarly, Golembiewski (1962) observed that the worker was a cog in the mechanical system of the organization and of interest only so far as he performed the expected functions. Whatever the individual brought to the workplace other than ability to do the job was largely irrelevant. Man was regarded as merely a performer of a particular function rather than as a complex entity. Golembiewski concluded that a lack of intimate friendly cooperation and understanding about the worth of people in the workplace was a detriment to job satisfaction. His findings indicated that when organizations considered the personal and social needs of people, they were more likely to have competent, committed, and fully functioning individuals. In contrast, Haire (1962) found that successful organizations created a structure and climate that focused on the strengths and interests of people and this enhanced productivity and satisfaction on the job. Similarly, the research findings of Stogdill (1965) indicated that



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The findings of this study have implications for leaders in any organization because work environments can be enhanced and job satisfaction enriched.

successful organizations considered worker morale and job satisfaction outputs of the workplace just as important as productivity.

Part of the changing character of American businesses was manifested in the climate of organizations. Steers and Porter (1975) studied climate and concluded that it could be considered the personality of the organization. That is an interesting definition. Climate was revealed by feelings of people and the comments they made about the place where they worked. The study of job satisfaction and organizational climate revealed that organizations gradually changed their perception and appreciation of workers. No longer were they considered mere cogs in the machinery of an organization. This perspective resulted in increased attention about how organizational climate and job satisfaction impacted institutional effectiveness.

### Findings of the Study

#### Profile of the Director of Physical Plant

For the purpose of this study, the director of physical plant was defined as the chief facilities officer at an institution. The

average director of physical plant was a white male. However, every ethnic/gender combination was represented. The average respondent had been in his or her present job for 5.21 years. Most directors of physical plants (65%) served at public institutions. Almost half of the respondents (42.6%) worked at institutions that had 5,000-19,999 students.

#### Director of Physical Plant Perception of Organizational Climate

Those who responded to the survey instrument revealed the presence of all organizational climate factors at their respective institution. These were internal communication, organizational structure, political climate, professional development opportunities, evaluation, promotion, and regard for personal concerns. Three of these factors—regard for personal concerns, professional development opportunities, and internal communication—received the highest mean score ratings. These data indicated that directors of physical plants believed they worked in environments where concern was shown for people, opportunities for further training existed, and internal communication was effective.

#### Director of Physical Plant Satisfaction with Organizational Climate

The three highest satisfaction ratings regarding the organizational climate factors were regard for personal concerns,

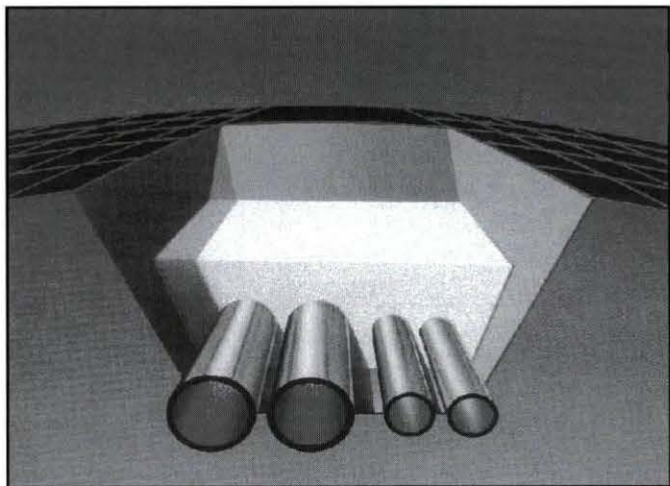
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professional development opportunities, and internal communication. Over 80 percent of directors of physical plants were satisfied with their positions on campus and almost 75 percent were satisfied with the overall operation of their college.

Physical plant director's satisfaction with regard for personal concerns was consistent with their perceptions about it. The overall perception of and satisfaction with regard for personal concerns were both above 80 percent. Similarly, the perception about professional development opportunities and satisfaction with them were consistent with each other. Most of the respondents (84.5%) perceived that there were ample opportunities for further training at their institution and that 81.8 percent were satisfied with these opportunities.

The mean scores revealed that the lowest level of satisfaction was with political climate. The data revealed that about half of the respondents (47.6%) were satisfied with the political climate while 52.4 percent were moderately satisfied or unsatisfied with the political climate on campus.

### ***Importance of Job Satisfaction***

All eight job satisfaction variables used in this study were important to directors of physical plants. Most important to them was the relationship with subordinates, relationship with superiors, relationship with peers, professional effectiveness, and benefits. Salary; autonomy, power, and control; and decision-making were less important to the respondents. These findings indicate that good relationships with others in work settings were most important to directors of physical plants. These findings supported the research of Jenkins (1999) and Medlin (1999) who stated that good relationships were the most important ingredient for success for managers of facilities. The fact that autonomy, power, and control as well as decision making were less important to directors of physical plants pointed out the significance of collaboration in the process of successful leadership.

### ***The Relationship between Measures of Organizational Climate and Measures of Job Satisfaction***

Internal communication was found to be significantly related to all eight job satisfaction variables. Organizational structure was found to be significantly related to decision making; autonomy, power, and control; relationship with peers; relationship with supervisors; and professional effectiveness. Political climate was negatively related to decision making; autonomy, power, and control; and relationship with supervisor.

Professional development opportunities were found to be significantly related to decision making; autonomy, power, and control; relationships with peers; relationships with supervisors; salary; benefits; and professional effectiveness. Opportunities in an organization to learn more had a positive impact on directors of physical plants because it tended to increase decision making abilities and to enhance relationships with supervisors. Moreover, professional development

opportunities tended to have a positive impact on salary and benefits for directors of physical plants. These findings reinforced the studies of Galpin (1996) and Cain (2000), who asserted that learning on the job and further study were mutually beneficial to the organization and the employee.

Evaluation was found to be significantly related to five of the job satisfaction variables: decision making; autonomy, power, and control; relationships with peers; relationships with supervisor; and professional effectiveness. These findings indicate that a fair and accurate evaluation process had a positive impact on decision making, autonomy, and professional effectiveness for directors of physical plants. Furthermore, when directors of physical plants perceived that the evaluation process was fair and accurate, the relationship with supervisors was positively impacted as was professional effectiveness.

Promotional opportunities were found to have a significant relationship with seven of the eight job satisfaction variables: autonomy, power, and control; relationships with peers; relationships with subordinates; relationship with supervisor; salary, benefits; and professional effectiveness. These findings pointed out the positive consequences of developing relationships with others in the workplace and provide examples of what some of the benefits could be since promotional opportunities were significantly related to salaries and benefits.

Regard for personal concern was also found to be significantly related to seven of the eight job satisfaction variables: decision making; autonomy, power, and control; relationships with peers; relationship with supervisor; salary, benefits; and professional effectiveness. These findings indicated that an organization that fostered a high regard for the personal concerns of others had a positive impact on employees...in this case, directors of physical plants. These findings supported the research of Capodagli and Jackson (1999) and Harris (1996) who provided their versions of the golden rule.

### **Summary**

The findings of this study have implications for leaders in any organization because work environments can be enhanced and job satisfaction enriched. In particular, these findings would be especially useful to administrators at institutions of higher learning, including directors of physical plants. These and other leaders interested in providing a positive organizational climate and helping people be satisfied on the job should recognize that it is important to consider the perspectives of those who do the work of the enterprise. For example, a demonstration of regard for the personal concerns of employees is necessary to have a successful caring organization that treats people as the most important resource.

Providing professional development opportunities is also an important and edifying component of organizational climate since it contributes to job satisfaction and ultimately to organizational success. Clear lines of internal communication are critical and an essential component of a positive organiza-

tional climate. They allow and help people to successfully interact so that the business of an organization can be effectively and efficiently accomplished. The perception that professional development opportunities exist is important to directors of physical plants. This feeling contributed to job satisfaction. A clear and fair process of evaluation was also important to these directors. Employees need to know organizational expectations and how well their performance is meeting these expectations.

Lastly, organizational structure is a major factor that impacts the success of people and ultimately the success of the organization itself. Just as the research of Kristof (1996) indicated, employees who have a comfortable fit within the organizational structure are more likely to be satisfied with it and more likely to be satisfied with their jobs.

The magnitude of the role that directors of physical plants have in the higher education enterprise was made clear by Ernest Boyer in a 1998 Carnegie Commission report: "One cannot be a core of excellence in higher education if you do not demonstrate a commitment to facilities. It is time to recognize that facilities provide the centerpiece around which all other functions in higher education take place" (Medlin 2000). Directors of physical plants have an important role in determining the quality of campus facilities and, consequently, the learning environment. Knowing more about the relationship between organizational climate and job satisfaction among these campus leaders could enhance the level of job satisfaction for directors of physical plants and positively impact their job performance. 🏢

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# Quality Measurement

## in a Facilities Environment

by Richard W. Robben P.E.

Traditionally the responsibility for ensuring quality has resided with the provider and was generally tracked and ensured through the use of inspection. Increased competition and greater demands by the end users of products and services, has resulted in a rethinking how quality is measured and delivered to the customer.

Total Quality Management (TQM) and Process Re-engineering have served to focus attention on the methods of service delivery or the processes used as a way of building quality into the final product. Inspection still plays a significant role in the total quality picture but is not the final measure. Below is a process that builds on customer expectations and asks:

1. What are the critical indicators that will define quality?
2. What actions can be taken to ensure that critical quality indicators are met?
3. How do you track all the processes so that indicators are maintained and reported back to stakeholders?

### Determination of Quality/Performance Measures

Most facility departments in the United States do not measure the performance of their operations. Reliance on "rules of thumbs, subjective evaluations, or war stories" are not typical techniques for reporting on the quality of delivered service. Instead measures used should be based on several important considerations:

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### 1. Customer Input

The most important requirement for the development of quality measures is a determination of factors that are critical to the customers and occupants of the facilities. To meet the customer's perception of quality, their input is necessary. Typical concerns of the customer that generally shape their opinions on the level of quality surround timeliness, cost, high standards of workmanship, worker courtesy, communication of issues and status, and the customer's level of control over the process.

#### *Developing Customer Expectations*

Measuring customer expectations and then aligning those expectations with the delivery mechanisms is the whole issue. It is impossible, however, to measure, record, and report quality without a definition of what constitutes quality. Several simple methods can be utilized to gain this valuable information.

A routine meeting that we call a customer focus group has served successfully for this purpose. The basic format of the meeting depends on where in the process of quality definition the facility organization is positioned. By working directly with the customer and reviewing their needs, topic-by-topic, the facility manager can achieve three objectives:

- a. The customers' expectations for the space can be developed in tangible terms of cleanliness, temperatures, pressures, available times for service, acceptable deviations, lighting levels, etc. Vague or subjective language can be avoided in favor of tangible or quantitative terms.
- b. By being present during the development of the expectations, the facility manager can interject information concerning the capabilities of the systems or the



workforce, budget restrictions, regulatory issues, etc. Major discrepancies between expectations and capabilities can be identified at the outset of the process and resolved.

- c. The customers' desired level of involvement can be determined. Does the end user wish to receive performance reports, cost information, or be involved with the prioritization of work requests?

This meeting also provides an excellent medium for the maintenance of positive customer relations and continuing customer education.

Another method of obtaining customer input to the quality definition involves the use of questionnaires and survey instruments. Some considerations covered in the survey instrument include the following statements.

- a. It must be targeted at the correct individuals within the customer group. The danger here is that the survey may be filled out by an assistant or individual other than the person who will be ultimately judging acceptable performance.
- b. If the survey is intended to be a snapshot of a particular issue, then the instrument should be short and to the point and the questions should be worded so that the responses can be reported back to all stakeholders as a measure of service quality.
- c. Another concern is that the same customers often keep receiving the surveys and can become inundated and, as a result, may not complete the surveys or may dilute the response quality. An alternative to the written feedback survey instrument could be a brief telephone survey.

## 2. Methods of Collecting Data

Unless there is a relatively simple method for collecting and reporting data, any system used will be difficult to monitor and may fall into disuse or data contamination. Computerized maintenance management systems (CMMS) can quickly and easily be configured to provide reports that can track the planned performance requirements. It is critical, however, that the methods of inputting the required work history are simple and in agreement with the types of information that need to be collected to support the quality measures.

Choosing elevators as an example, the mean time between elevator failures cannot be reported if the time and date of failure and the return to service are not recorded. Often work order creation and closeout dates are generated automatically by an CMMS. Clearly, this would not satisfy the data need if mean time in hours was a critical quality indicator. Therefore, when developing quality indicators, "reality checks" should be made during the process to guarantee the feasibility of tracking and reporting of the quality factors.

## 3. Standards

Relying solely on the customer's expectation is an excellent way to abrogate the facilities managers' fiduciary responsibility for the stewardship of facilities. We as facility managers have access to a wealth of information

from a variety of sources to assist us in determining the correct methods of maintenance, operation, and construction. Some of these sources can include the following.

### *Trade Organizations*

As members of trades organizations, we receive information covering every conceivable facility topic. Information on organizational structure, staffing, and processes for every aspect of facilities management can be obtained. Some organizations of note are:

- APPA—Association of Higher Education Facilities Officers
  - IFMA—International Facility Management Association
  - BOMA—Building Owners and Managers Association
- There are many more.

### *Benchmarking*

As with the trade organizations, information can be gained from interchanging information with those organizations that are viewed as peers or companies that perform some aspect of the facilities responsibilities particularly well. Ideas can be gained from other organizations complete with all the details of how to execute them.

### *Manufacturers*

Manufacturers and their related associations also provide information on the details of maintaining equipment and structures, good design practices, acceptable maintenance intervals, methods and practices for improving service, and controlling maintenance costs.

## 4. Expertise of the Workforce

Quality service delivery begins with the worker and lies in the knowledge level of the workforce. Knowledge level goes beyond the single aspect of technical expertise. Technical knowledge of the job is important, but so is expertise in the processes of delivering service. Training is the key to a capable workforce that is customer oriented. Programs for the enhancement of worker skills should cover: customer service, effective communication, work procedures (non-technical), safety, and technical maintenance skills and procedures.

### *Training*

Training should be conducted on items directly bearing to the performance of work and tracked to ensure it is properly conducted. Training should also be reinforced on the job through quick application of what is learned.

This process should determine the required aspects of training or what the needs are. Determining needs is twofold: first, to ascertain at a high level what types of training are required to support the service delivery mission, and second, working at the lower levels in the structure using work teams of individuals involved in the process to fill in certain detailed

training activities as required. Typically the following types of training will be in the program:

- a. Process—The procedures of administering the work process.
- b. Safety and Regulatory—Learning the regulations to ensure code compliance.
- c. Technical—That which is necessary to maintain the technical skills of the employee.
- d. Personal Development—Content is determined by the values of the organization, 7-Habits, advancement, etc.

The information/criteria collection process described above is the most difficult aspect of measuring quality. It is critical at this stage to use an iterative process of identifying quality criteria and then checking:

- a. The stakeholder agreement with the selected criteria.
- b. The ability to track the selected quality indicators.

If either of these parameters is not present, revisit the selected indicators, the stakeholder's opinions, and the methods of collecting the data.

### The Administration of the Process

How well the quality measurement process can be sustained is directly related to the effort made to correlate the desired quality measures against the means of tracking the raw data. CMMS are typically the cornerstone for tracking and reporting the raw data. It is critical, however, that the

raw data is collected and input into the database. Several considerations bear attention by the facility manager in administering this part of the process.

### Access to Results Data

The information gained serves no value if it is distributed on a limited basis to the organization. It is important that access to CMMS terminals or distribution reports are provided to all stakeholders. If workers and management are to act on the data, then it must be readily available. Also, the backup information must be easy to analyze and utilize for quality improvement.

### Worker Involvement in the Data Collection and Input

Recording of input data should be as close as possible to the services delivery point. Electronic methods such as bar coding and PDAs can be used in many maintenance applications. Time recorded on the ticket, feedback in form of repair, and problem codes can be easily entered as text comments.

### Quality of Input Data

The accuracy of the information being entered into the quality database must be high. Data bits should be kept as simple as possible. Code data can be used to replace text. For

example, the use of repair and problem codes is necessary to avoid the use of text entry that can be misinterpreted or difficult to analyze. The input process needs to be closely monitored and the personnel responsible for input of data must be kept aware of the procedures and the need for accuracy.

### Time Lags in Data Input

Delays in entering data in the CMMS can cause reporting problems. For example, materials may be assigned to work orders at a time point in the work order process that is different from the other data. These time lags must be considered in the reporting process to make sure information is complete before it is reported as final.

### Level of Effort to Enter Data

Depending on the application of the data, every effort should be made to make data entry as simple as possible. It should be an integral part of the work process. Training is key in this area. If those responsible for the development

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and entry of results data view the data collection as problematic, it will not occur as anticipated.

## What to Track

The indicators below are typical, but not all exclusive of the types of customer-focused measures that will develop as a result of the process. Three categories related to time, value, and cost are presented.

### Time

Timeliness of delivered services is a critical evaluator of service level by the customer. The following may provide assistance in making suggestions to stakeholders in order to track quality associated with time.

- **Response Time.** The time that it takes to respond to customer requests for service can be tracked as an indicator of the ability of the organization to provide prompt service delivery. Some examples could be first response, time to completion, or time to invoice.
- **Scheduled v Actual.** "On-time performance" compares when a service item is scheduled v when the service is actually provided.
- **Preventive Maintenance Completion Rate.** This measures the compliance by the service provider in completing predetermined work tasks.
- **Work Status.** Knowing what is going on and communicating it to the customer creates a strong customer provider relationship.

### Value

Underlying this element is the basic assumption that by meeting the customers expectations, you are 90 percent of the way to providing quality service. The following indicators are suggestions of how well the organization plans and executes the service.

- **Rework.** Tracking the number of times that services have to be re-performed because of mistakes, poor workmanship, improper definition of scope, or inadequate communication are excellent measurement indicators.
- **Change Order Rate.** The number of change orders that are required during a project or on a work request are indicators of the quality of the original scoping documents and/or description of the service required. This factor is also an indicator of how well original estimates are met.
- **Breakdown Rate.** This measure provides an indicator of the effectiveness of the maintenance

program. For example, as preventive maintenance effectiveness increases, the number of corresponding breakdowns should decrease.

- **Training level.** Track and report the training level of the organization by comparing the items identified in the needs analysis v the amount of training actually conducted.
- **Deferred Maintenance.** Assess the condition of the facilities at regular intervals and report the level of required work needed to bring the facilities back into a new condition.
- **Customer satisfaction.** Direct customer surveys can provide a clear and direct indicator of an organization's ability to meet customer expectations. Formulation of the survey questions using customer input is critical.

### Cost

Far too often this indicator is taken out of the context of quality indicators and made to stand on its own. Taken by itself, cost can be the nemesis of quality. If cost is to be an indicator then expectations must be aligned with what can be achieved at the target cost level. Some indicators of cost are:

- **Estimated v Actual Cost**—The ratio of a pre-estimated cost divided by the actual cost to perform a specific service. This can include labor materials, subcontracted

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services, or any combination thereof. This indicator can be applied to single work orders, projects, or service contracts.

- **Charge or Recharge Rate**—The cost of the workforce on a unit basis that can be compared to similar rates of other organizations or contractors. One labor/hour of work with benefits, overheads, and profits (if applicable) can be tracked and reported to stakeholders. These can give an indication of the value of the internal company facility organizations' use of outside contractors.

## How to Report Back to the Stakeholders

Information on the performance of the service organization is of no value if only higher levels of management retain it. Quality indicators should be shared with all stakeholders. Therefore, the first rule of using, recording, and reporting quality is to distribute the information widely.

Management should review quality information regularly with customers and workers. Some of the same methods that were used to develop the quality parameters can be used for discussion of the resultant performance measures. Specifically, the customer focus group or a routine quality meeting should

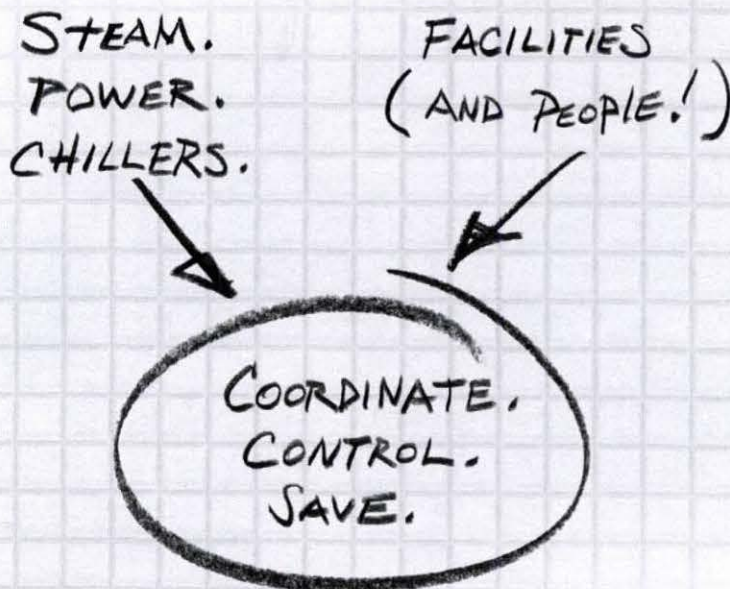
be a recurring event to serve this purpose as well. This meeting will provide a critical interface to ensure that all parties are interpreting the data in a similar fashion. It provides a forum in which deviations can be discussed, remedies determined, and expectations reconfirmed. It will also address several critical factors associated with the determination of quality that should be reviewed at the performance meeting including:

- Customer satisfaction with the process
- Work plan adherence—service contract
- Routine reporting of indicators
- Cost comparisons—value
- CMMS utilization—presentation and collection of data

Since not all customers will wish to meet routinely with the service provider, it is important that reports generated serve as a good substitute for these meetings.

The process of ensuring quality requires the attention of the facility manager. Systems can be established that will ease the amount of time that needs to be committed to the collection of data, but a strong commitment of time and resources must be made by the manager to keep the quality topic at the forefront of the organization. Training, review of the data collected, acting on that information, and openly communicating the information to the customer and all levels of the organization are the foundations of operating in a quality environment. 🏢

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## My Final Challenge to Leaders

by James E. Christenson

*For the effective leader, change is a friend, a companion, a powerful tool, the basis of growth. Creating positive change is what leadership is all about.*

—Stephen R. Covey and  
A. Roger Merrill in  
*The Nature of Leadership*

This will be my last column for *Facilities Manager*. I have now been retired from the facilities management profession for four years. In one way, it seems to be an amazingly short time since I was actively engaged in that work at the University of Michigan. Even so, I already feel out of touch with what is going on in your lives today. While the basic nature of leadership doesn't change radically with time, its application to day-to-day issues does. In the profession of surveying, field notes are useful soon after they are taken; their value fades rapidly with the changes that take place over time. So it is with my "field notes" on facilities management issues. But before I go, I want to leave you with some final grandfatherly bits of advice that are obvious, but still important and timeless. What follows is based both on successful attitudes and actions that I have observed and experienced and those that I have, too late, realized were missing.

People and the quality of the relationships between them are always most important. Technology, policy, business partner support, customer

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**Jim Christenson is an APPA member emeritus and can be reached at [jchrste@jackelec.com](mailto:jchrste@jackelec.com). This is Jim's last column for *Facilities Manager*. A collection of his work has just been published by APPA as *Field Notes: Commentaries on Leadership and Facilities Management*.**

service, and expenditure control are important too. But it is the people in an organization that define its value, its reputation. Listen to them, to all of them. They are on the front line of service. Each one, if he or she trusts you, will share feelings or ideas that you can use in doing your job better.

Help the people in your organization to grow—in skills, in proactivity, and in serving the members of your institution. Even in tough economic times, be willing to support robust and pertinent training and education. This investment leverages the effectiveness of the organization and gives a powerful feeling of satisfaction and self-confidence to those who are willing to grow. Linked with the training and education, give people appropriate and understandable boundaries within which they are completely free to perform their service. Give them the "why" and the "what" and let them determine the "how," using their training and innovation.

Your customers, those you serve, are only a little less important than the people in your own organization. Most of them do the things that students come for and pay for. And, of course, the students and their parents—and, for most of you, the taxpayers—are the ultimate customers for all members of the institution. Thoughtful listening works well for all of these folks, too. How else can we really understand their needs, their goals, their frustrations?

As we listen to the many voices, we may hear conflicting messages. Sorting the widely dispersed data to yield meaningful knowledge and translating that knowledge into the wisdom needed to determine appropriate action is hard. But that's what a leader must do. Isolated, unique comments may require an action response. When many

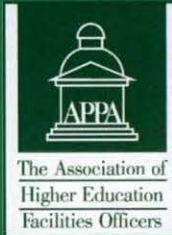
voices identify a problem or point to an opportunity, an action response becomes imperative.

What you learn from people within and outside your organization can be the most important seeds for change. You will never find a time when everyone you talk to will say, "Don't change a thing; everything is perfect as it is." Change is the basis for growth, as Covey and Merrill suggest. Creating positive change that points to a worthy vision of the future is really what leadership is all about.

As I've discussed in earlier columns, however, change is a fearsome thing—especially when imposed from without. Change from without is increasingly imposed on our institutions, on our facilities organizations, and directly on us. Often, these changes are also the triggers for changes you must make. Whatever the source of the seed of change, to be helpful and lasting, change usually has to be based on shared information and dialogue. Without involvement of those affected, they will make no transition to the new paradigm.

The usefulness of listening and the quality of positive changes depend on the level of trust that those involved have in you. See to it that you are completely trustworthy, that you deserve to be trusted. There is absolutely nothing that can be substituted for trusting relationships. Charisma is perceptual. Great oratory is entertaining. Trust is fragile and easily lost by insensitive leaders. But trust earned over years and maintained by deliberate, consistent action paves the road to any positive vision.

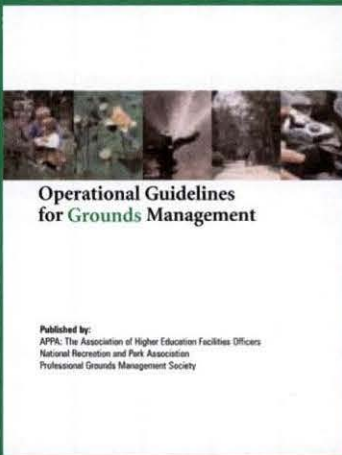
I wish all of you the best on your leadership journey. Your leadership affects the lives of many. May the way you affect them be a long-term source of inspiration, hope, and success. 🏠



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## Needed: Owner's Manual For Educational Buildings

by Eric Dillinger

Imagine buying a new automobile without knowing how to start the motor, when to change the oil, or what the instruments on the dashboard indicate. Instead of handing you a copy of the owner's manual along with the key, the dealer turns over an armful of engineering schematics, diagrams, and blueprints and cheerfully waves goodbye as you drive off in confusion.

That's exactly what happens too often when a newly completed building is turned over to the institution and the facility manager. Architects, engineers, and contractors deliver numerous construction documents, but this information is almost useless to the operations and maintenance staff. The information is dense, voluminous, and close-to-incomprehensible for anyone except experienced design professionals.

Educational facilities managers may find some of this information useful, but they need something beyond conventional blueprints and schematics. There is a disconnect between the information provided by the engineers and architects and the information that facilities managers can use. Facilities managers need, in effect, an owner's manual for the building and its systems.

Work on a building doesn't stop upon completion. It is estimated that 60 to 75 percent of the total lifetime cost of a building occurs after construction. Maintenance and operations expenses are vital components of



the entire life-cycle costs of a structure, and it is a mistake to ignore their impact on the total.

Today's facilities managers are not being given the right tools to develop a coherent maintenance strategy geared toward a unique structure and its specific systems. The onus for this problem is on us, the design and construction industry. Building owners and operators should be provided with a rational maintenance strategy for their structure; if they don't get it, they should demand one be provided.

An educational building enclosure operates as a machine for conducting transactions between buyer and seller. It consists of architectural structural members; mechanical, electrical, and plumbing systems; and myriad of other systems and subsystems that work together as a functional whole. Keeping this machine at peak efficiency and effectiveness is the function of the facilities manager and, ultimately, the building owner. Unfortunately, architects, engineers, and contractors who are knowledgeable about these systems and how they work together too often fail to give the responsible parties the information needed to perform this function.

Rather than simply handing over construction documents, contractors, engineers, and architects should deliver a program that details how to run the building and keep it functional over the next 50 years. We can't assume that every facilities manager is an experienced veteran with the insight and education of an engineer, because that isn't the case.

The solution to the problem is not more data, but better information. Some say information is knowledge, but they aren't the same things at all. People turn information into knowledge based on experience, but without the right information the knowledge is lacking. Construction documents may contain the essential information about a structure, but they don't give building owners any insight into operations or maintenance. Operators of educational facilities need a distilled, step-by-step guide with clearly defined steps and procedures, written so they can be understood by non-technical personnel.

A coherent building operational plan should divide system maintenance into three segments: preventive/scheduled, predictive, and run-to-failure.

**Preventive/scheduled maintenance** is for essential systems that cannot be allowed to break down or fail. That is why you should change the oil in your car every 3,000 or 5,000 miles. There's no way an average motorist can know if the oil is dirty or breaking down in the engine, so the oil must be changed regularly to prevent fatal damage to the engine.

**Predictive maintenance** is for systems and equipment that can be monitored for signs of trouble. For example, you don't automatically

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*Eric Dillinger is vice president, facilities management services, Carter & Burgess, Inc., Fort Worth, Texas. He can be reached at [dillingeret@c-b.com](mailto:dillingeret@c-b.com). This is his first article for Facilities Manager.*

change the tires on your car as soon as they have 30,000 miles on them. But you might check the tread and the inflation pressure more often as they age because these are better indications of how long the tires will remain serviceable than mileage alone.

The distinction between preventive/scheduled maintenance and predictive maintenance can be seen in air filters for HVAC systems. Manu-

facturers often recommend that filters be replaced every four months so the contractor tells the facility manager to replace the filters three times a year as a preventive measure. However, from a predictive viewpoint, the filter's useful life might be much longer. The remaining effective life can be determined better simply by removing them and looking at how dirty the filters might be rather than relying on

Today's facilities managers are not being given the right tools to develop a coherent maintenance strategy geared toward a unique structure and its specific systems. The onus for this problem is on us, the design and construction industry.



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a strict schedule. Some filters might last much longer than a few months, but the life span of an air filter will be shorter in an arid environment with frequent dust storms.

Then there are items that qualify as **run-to-failure** and can be allowed to fail without consequence. For example, light bulbs in a janitor's closet should be replaced only when they fail, because their failure will not affect life, property, or any other system in the building.

Institutions of higher education often spend far too much money to over-maintain facilities because they don't have the correct information for a coherent maintenance strategy. Architects, engineers, and contractors should develop a seamless system to ensure a smooth transition from construction documents to maintenance programs and to turn construction documents and specifications into a true decision-making tool for building owners and operators.

A comprehensive maintenance strategy should be built into the structure from the design phase through the construction phase. As construction documents are generated, part of the plan must be to protect the long-term productive life of the facility. 🏢



# The Bookshelf

Book Review Editor: Theodore J. Weidner, Ph.D., P.E., AIA

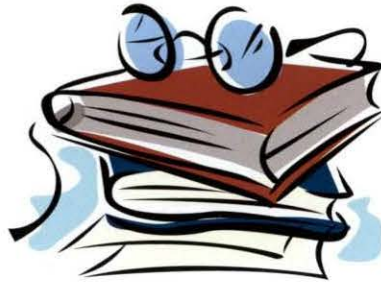
Facility managers are always concerned about maintenance. They know that equipment must be maintained today to ensure it will work tomorrow. However, describing how to do that maintenance or understanding the value of it may be more elusive. This month features two books that may provide those missing tools.

\* \* \*

**Life Cycle Costing for Facilities**, by Alphonse Dell'Isola and Stephen J. Kirk. Kingston, Massachusetts: R.S. Means, 2003, hardcover.

How many times have you put together the 'perfect' project—right budget, right schedule, right scope of work—and then something went awry. The bids were opened and you were no longer within budget. You could go to your boss and beg for more money or you could scrap the project and start all over again. Both options are unpleasant, but you preferred the first. Yeah, your boss wanted to know why you needed more money, why couldn't you VE (value engineer) the project and make it cheaper; take out the things that cost so much? If you hadn't read *Life Cycle Costing for Facilities*, by Dell'Isola and Kirk, you wouldn't have the answers and you might end up with a less-than-satisfactory project.

**Ted Weidner is president of Facility Asset Consulting, Amherst, Massachusetts. He can be reached at [ted@weidnerfac.com](mailto:ted@weidnerfac.com).**



I am not suggesting that this book will solve all your problems, only fairy tales do that. But this book provides the tools to assemble the argument that says the high quality or long-life components, the expensive things, are justified and really cheaper in the long run. Don't get me wrong, I'm not advocating terrazzo over VCT or plaster over GWB, you will have to prove that yourself. However, if you've done your homework right you'll be able to use this book and convince your supervisor (the tight-fisted bean-counter) that your project is worth the investment since the college is going to be using (and maintaining) these items for a long time.

Living in the world of maintenance, where convincing people to spend more money on facilities is a fact of life where I welcome all the help I can get. Understanding the time-value of money, how to equate future expenditures to today's costs, and how to balance first costs against life-cycle costs is essential. A college class in engineering economics or microeconomics teaches many of the concepts presented in this book. However, your old college textbook might not be arranged in a way that makes it easy for you to assemble your argument.

*Life Cycle Costing* provides the financial and mathematical basics in

I am not suggesting that this book will solve all your problems, only fairy tales do that. But this book provides the tools to assemble the argument that says the high quality or long-life components, the expensive things, are justified and really cheaper in the long run.

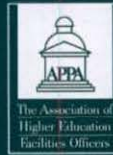
the first two chapters with real facility case studies. It prepares you to address arguments about the uncertainty of your assumptions or the sensitivity of the analysis; both are questions the typical business officer will challenge you on when asked to spend more money. It also provides some good examples of how to frame the problem, analyze it, and present the results—which may not be the answers you wanted but will be useful. The book contains good graphs and figures that demonstrate economic and organizational concepts. And best of all, there's additional excel files that contain the *Life Cycle Costing for Facilities* program available on the vendor's website.

You may scoff at value engineering and life-cycle costing, but they are tools that your supervisor will use even if you don't. It is best to be prepared for the argument by using the tools that may be used against you; *Life Cycle Costing* will help.

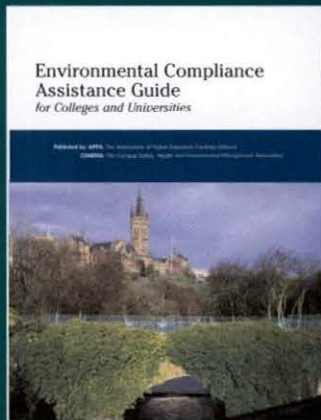
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# Environmental Compliance Assistance Guide

## for Colleges and Universities



A Joint Publication from APPA:  
The Association of Higher Education  
Facilities Officers (APPA) and  
The Campus Safety, Health and  
Environmental Management Association



The idea behind the partnership of APPA and CSHEMA was to produce a guide that would assist colleges and universities in meeting the basic requirements of the environmental regulations. The *Environmental Compliance Guide* accomplishes this and much more!

The *Environmental Compliance Guide* will provide you with a basic understanding of the various obligations that the body of environmental law imposes on campuses and help you develop compliance plans for your campus.

In today's environment, colleges and universities seeking to meet the legal requirements from EPA must realize that the body of environmental laws is much broader than simply the disposal of chemicals or running an asbestos abatement program. Schools that meet the requirements set by the EPA or by state regulators are not simply doing one or two things right—they're doing everything right! Environmental compliance is constantly changing—with new laws, rules, and initiatives passed frequently and innovations being developed as everyone seeks more efficient methods for compliance. Institutions must constantly remake, expand, and improve their environmental programs. This guide will show you the way.

*Environmental Compliance Guide for Colleges and Universities* contains:

- A narrative chapter explaining the effective elements of an environmental management program and how implementing these elements may reduce the potential of an EPA inspection on your campus.
- Abstracts of programs derived from eight environmental statutes that were recently the focus of EPA inspections on campuses.
- An easy-to-read matrix highlighting areas of potential regulatory concern on your campus, in the areas of Academics, Student Activities, Operations, Maintenance, or Utilities.
- The Inclusive Resources section gives key links to EPA documents that describe regulatory standards and provide assistance with them, as well as Web addresses for everything you ever need to know about compliance.

## Contents

Introduction: Taking Control of Your Environmental Impact

### Section 1

Building an Effective Environment Management Program  
Foundation: Finding Your Change Agent  
Next Step: Analysis, Preparation, and Planning  
Continuing Commitment: Create Responsibility  
Maintaining Momentum: Foster Partnerships  
Program Development and Continuous Improvement  
Basic Program Elements  
Effective Program Elements

### Section 2

Regulatory and Campus Programs Matrix

### Section 3

Legislative and Regulatory Program Summaries  
The Clean Air Act (CAA)  
The Clean Water Act (CWA),  
The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)  
The Emergency Planning and Community Right-to-Know Act (EPCRA)  
The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)  
The Resource Conservation and Recovery Act (RCRA)  
The Safe Drinking Water Act (SDWA)  
The Toxic Substances Control Act (TSCA)

Appendix A: Environmental Compliance Resources

Appendix B: Abbreviations

Appendix C: Under the Microscope, EPA and States Pursue Colleges and Universities

Visit APPA Bookstore Online at [www.appa.org/publications](http://www.appa.org/publications). Request an Order Form and Fax it to 703-549-2772. Mail your Order Form to 1643 Prince Street, Alexandria, VA 22314-2818. Questions? Call APPA at 703-684-1446 ext. 235, or e-mail [cotrenia@appa.org](mailto:cotrenia@appa.org). No phone orders, please.

Continued from page 55

**Fundamentals of Preventive Maintenance**, John M. Gross, New York, New York: AMACOM, 2002, 217 pages, hardcover.

**We all know that** maintenance is important in the preservation of facilities and that preventive maintenance will save money. But what we often don't know is how to set up a preventive maintenance program and how to demonstrate its effectiveness. If you're new to the facilities maintenance field then you will be interested in *Fundamentals of Preventive Maintenance* by John M. Gross.

Written from an industrial or manufacturing perspective, this book can be easily applied to educational facilities with little adaptation.


This book is written in a relaxed style, rather like a conversation between a coach and trainee, and has numerous helpful hints and forms. A CD-ROM, included with the book, provides copies of these forms in PDF format so they can be printed, reproduced, or revised to meet site specific needs. The book begins with a general overview of preventive maintenance and in subsequent chapters outlines how to conceive, lay out, begin, lead, and take initial measurements of the effectiveness of a preventive maintenance program.

Written from an industrial or manufacturing perspective, this book can be easily applied to educational facilities with little adaptation. Chapters about equipment identification and inventory control are very helpful for anyone in a small organization that doesn't have access to expertise in these areas. While there's a cogent argument for a CMMS (computerized

maintenance management system), the book's focus is on paper-based techniques and systems that are easily computerized. There is a lot to be said for beginning with a manageable paper-based system before leaping into a CMMS; a computer won't make a bad system work better.

However, the book's title, *Fundamentals of Preventive Maintenance*, tells it all. Examples of preventive maintenance

costs v operate-repair costs are absent as are the mathematical concepts that a financially-oriented supervisor would require when reviewing requests for resources. This book is for the beginner, either to the maintenance field or one promoted up the ladder into supervision. It is an economical alternative to sending a person to a week-long seminar on preventive maintenance. 📖



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# Supervisor's Toolkit

## Nuts and Bolts of Facilities Supervision



September 12-16, 2004  
Montreal, Canada

### Structure

*This exciting new program, developed for front-line supervisors and written by facilities professionals and trainers, will be held in Montreal, September 12-16, 2004, alongside the Institute for Facilities Management. The training program consists of the following topics:*

### Schedule

**Sunday, 10:00 am-2:00 pm**

**Module 1: Supervision, What Is It?** Learn to define effective facilities supervision; identify the roles and responsibilities of supervisors; and understand four key functions of supervision.

**Monday, 8:00 am-11:50 am**

**Module 2: It's More Than Administration.** Learn to understand the supervisor's role in administering organizational policy and procedures; recognize the legal considerations in the facilities environment; and gain an awareness of resource management.

**Monday, 1:00 pm-4:50 pm**

**Module 3: Communication, Let's Talk!**

Identify barriers to effective communication; demonstrate communication skills; and understand your role in the communication process.

**Tuesday, 8:00 am-11:50 am**

**Module 3: Communication, Let's Talk!, continued.**

**Tuesday, 1:00 pm-4:50 pm: Module 4: If It Weren't for the People.**

Understand the importance of developing and maintaining effective relationships with others in the workplace; examine the different types of relationships that exist in the workplace; and identify strategies and skills for improving relationships with others.

**Wednesday, 8:00 am-11:50 am**

**Module 5: Motivation and Performance.**

Identify methods of training and developing employees; ascertain methods of positive reinforcement; and understand

the importance of performance management and evaluation.

**Wednesday, noon**

**Free afternoon/lunch & dinner on your own.**

**Thursday, 8:00 am-11:50 am**

**Module 6: Customer Service Triangle.** Learn to create a basic understanding of three major aspects of customer service which include process, experience, and recovery; examine the role of the supervisor in customer service; and help participants identify areas for improvement in service delivery in their organizations.

**Thursday, 1:00 pm-4:50 pm**

**Module 7: Supervisors as Leaders.** Master techniques to understand critical elements of leadership; transition from managing to managing and leading; and understand your own preferred leadership style, and **Module 8: Synthesis.** Look at lessons learned, examine your toolkit, and evaluate the program's effectiveness.

### Tuition

APPA members: \$795

Nonmembers: \$995

### Meals

Several meals are included in the registration fee: breakfasts from Sunday through Thursday; lunches for Monday, Tuesday, and Thursday; reception and banquet Thursday; and refreshment breaks from Sunday through Thursday. All other meals are at the attendee's expense.

### Materials

Materials will be provided to students at registration.

### Accommodations

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**Fax: 514-954-2296**

**www.fairmont.com**

### Travel

Association Travel Concepts

**www.atcmeetings.com**

**Phone: 1-800-458-9383**

**Fax: 858-362-3153**

Registration fees do not include lodging or travel and room reservations must be made separately.

### Trainers

**Carol Trexler** is coordinator, facilities human resources, facilities business administration department, Rutgers University, New Brunswick, New Jersey.

**Nancy Yeroshefsky** is the assistant director, human resources, University of Maryland, College Park, Maryland.

For a more information on the **Supervisor's Toolkit** program, visit [www.appa.org](http://www.appa.org).

# New Products

New Products listings are provided by the manufacturers and suppliers and are selected by the editors for variety and innovation. For more information or to submit a New Products listing, contact Gerry Van Treeck, Achieve Communications, 3221 Prestwick Lane, Northbrook, IL 60062; phone 847-562-8633; e-mail [gvtgvt@earthlink.com](mailto:gvtgvt@earthlink.com).

**Silent Knight**, part of Honeywell's Fire Systems Group, offers industry-wide compatible fire alarm solutions for small- to mid-size institutions. Silent Knight introduces its Model 5104, a six-zone fire control communicator that provides digital fire reporting over ordinary telephone lines, thus eliminating the need for costly leased lines. The 5104 can be used as a stand-alone system or can be incorporated into an existing system as a Slave DACT. For additional information, please call Silent Knight at 763-493-6400.



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## Schoolcraft Publishing

announces the launch of their website [www.schoolcraftpub.com](http://www.schoolcraftpub.com). By connecting to this site you will gain access to the largest technical skills library on the market. You can quickly find technical skills training materials that meet your needs by using the built-in, interactive course catalog. Course offerings include blueprint reading, metals, safety, fluid power, HVAC, welding, process instrumentation, electrical, mechanical, machining, etc. For additional details, log on to Schoolcraft Publishing at [www.schoolcraftpub.com](http://www.schoolcraftpub.com).



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# Coming Events

## Coming Events

For more information on APPA seminars and programs, visit our website's interactive calendar of events at [www.appa.org](http://www.appa.org).

### APPA Events - 2004

**Jun 20-24—Leadership Academy.** Fort Lauderdale, FL.

**Jul 25-27—Educational Facilities Leadership Forum.** Washington, D.C.

**Sep 12-16—Institute for Facilities Management.** Montreal, Canada.

**Sep 12-16—Supervisor's Toolkit: Nuts and Bolts of Facilities Supervision.** Montreal, Canada.

### APPA Regional Meetings - 2004

**Sep 18-21—RMA Regional Meeting.** Jackson Hole, WY. Contact Mark Shively, 307-766-2537; e-mail [mshively@uwyo.edu](mailto:mshively@uwyo.edu).

**Sep 22-25—PCAPPA Regional Meeting.** San Diego, CA. Contact Scott Burns, 619-594-6001; e-mail [sburns@mail.sdsu.edu](mailto:sburns@mail.sdsu.edu).

**Sep 26-29—ERAPPA Regional Meeting.** Syracuse, NY. Contact Robert Britton, 315-443-3520; e-mail [rkbritto@syr.edu](mailto:rkbritto@syr.edu).

**Oct 8-13—CAPPA Regional Meeting.** Kansas City, MO. Contact Darrel Meyer, 816-759-1061; e-mail [darrel.meyer@kcmetro.edu](mailto:darrel.meyer@kcmetro.edu).

**Oct 28-Nov 2—SRAPPA Regional Meeting.** New Orleans, LA. Contact Marion Bracy, 504-483-7507; e-mail [mbracy@xula.edu](mailto:mbracy@xula.edu).

**Oct 31-Nov 3—MAPPA Regional Meeting.** Cleveland, OH. Contact James Cesen, 216-368-6537; e-mail [jac5@cwru.edu](mailto:jac5@cwru.edu).

### Other Events

**June 9—Team Cleaning: The Benefits Outweigh the Difficulties.** Teleconference. Contact Bernie Castillo at 210-567-2700, [castillob@uthscsa.edu](mailto:castillob@uthscsa.edu).

**June 20-22—56th International ACHUO-I Conference.** Montreal. Contact 614-292-0099, [www.acuho.ohio-state.edu](http://www.acuho.ohio-state.edu).

**June 22-23—Preventing and Solving Moisture-Related Problems in Buildings.** Madison, WI. Contact Raymond C. Matulionis at [matulionis@epd.engr.wisc.edu](mailto:matulionis@epd.engr.wisc.edu) or visit <http://epdweb.engr.wisc.edu/WEBF712>.

**June 23-25—Lighting Educators.** Cleveland, OH. Contact GE Lighting Institute at 800-255-1200, [www.gelighting.com](http://www.gelighting.com).

**June 28-30—Advanced Lighting Concepts.** Cleveland, OH. Contact GE Lighting Institute at 800-255-1200, [www.gelighting.com](http://www.gelighting.com).

**Jul 14—Myths and Facts: Environmental Infection Control in Health-Care Facilities.** Teleconference. Contact Bernie Castillo at 210-567-2700, [castillob@uthscsa.edu](mailto:castillob@uthscsa.edu).

**Aug 2-4—Fundamentals of Lighting.** Somerset, NJ. Contact Philips Lighting Company at 732-562-3600, [www.lighting.philips.com/nam/ltc](http://www.lighting.philips.com/nam/ltc).

**Sept—Facilities Management and Maintenance-Work Group 70.** East Lansing, MI. Contact Ron Flinn at [ftflinn@pplant.msu.edu](mailto:ftflinn@pplant.msu.edu) or visit <http://www.pp.msu.edu>.

**Sept 12-14—CMAA's 2004 National Conference & Trade Show.** San Antonio, TX. Contact Construction Management Association of America, 703-356-2622, [www.cmaanet.org](http://www.cmaanet.org).

**Sept 22-24—World Energy Engineering Congress & High Performance Facilities Expo.** Austin, TX. For more information, e-mail [info@aeecenter.org](mailto:info@aeecenter.org).

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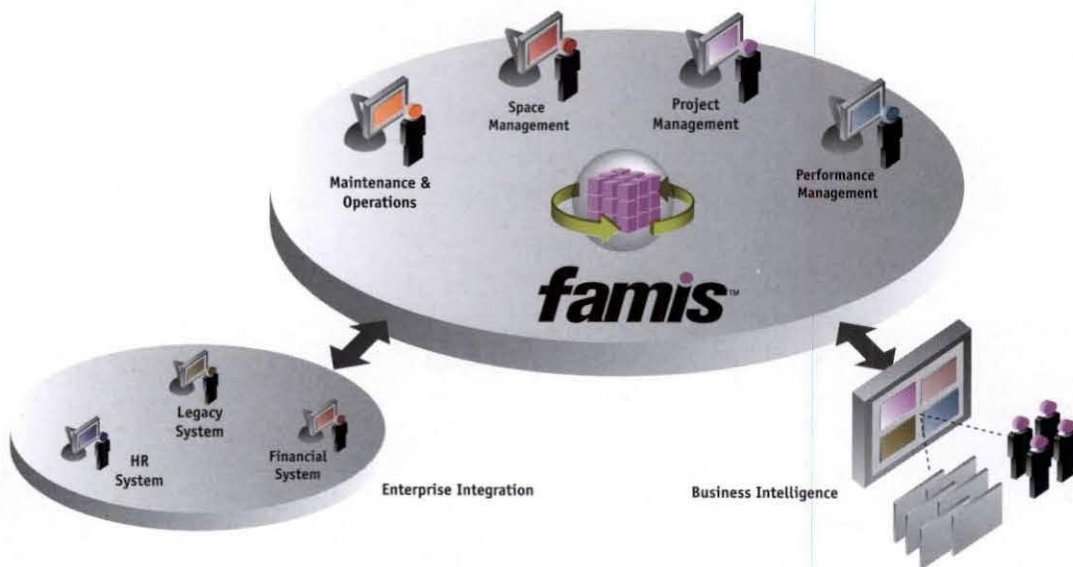
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