Facilities Manager

The
CAMPUS
of the
FUTURE

New Grounds for Learning

Facilities Manager

FEATURES

Departments

Facilities Manager

From the Editor

Steve Glazner

The campus of the future is obviously a nebulous thing to ponder. Earlier discussions on the topic generally presented the conclusion that most campuses would not exist in their currently recognizable forms. Several core campus buildings would remain primarily as structures housing more and faster computers, which themselves would contain the accumulated knowledge that previously had been taught by actual humans—professors or, more likely, graduate assistants.

A college education would be available to anyone accessing their degree program of choice from the comfort of their home via their combination television/computer/telephone/microwave oven. Interaction between professor and student, and among students themselves, would be unnecessary or unavailable except through e-mail. Commencement exercises would consist of a congratulatory .wav file and a downloadable diploma, which would be released to you only if your Internet account was paid up.

Once the higher education community started visualizing the campus of the future—and then taking things to their "natural" extremes—the prevailing wind seems to be a bit more rational. There is so much to be valued and retained in the traditional college experience that future generations of students will probably always have the option of steeping themselves among the sandstone, limestone, or ivy-covered walls of their predecessors.

For many, however, the "college experience" has *never* been a four-year stint from high school graduation to age 22. All the current, and quite basic, concerns—retraining, putting off college until later in life, alternative career choices, child care, increasing buying power, accessibility of learning to home or workplace—will only grow in number and intensity. How we deal with new technologies, how we assess and understand the changing demographics of our students, and our ability to compete for qualified faculty and administrative staffs will challenge everyone in higher education administration.

This issue of *Facilities Manager* presents a number of perspectives on the theme of the campus of the future and how the role of the facilities professional will, and must, certainly change to continue serving the evolving missions of our higher education institutions. ▲

APPA
News

Thomas F. Vacha

Mourning the Loss

APPA lost a good friend and a tremendous leader when Thomas F. Vacha died of cancer on July 8. Vacha was APPA's President-Elect and was to have been installed as President at APPA's annual meeting on July 15. The APPA Board of Directors posthumously awarded Vacha the Meritorious Service Award, APPA's highest individual honor, at the annual meeting banquet. Vacha's daughters, Tammy and Tara, accepted the award on their father's behalf. In addition, the Board officially named APPA's conference room in Vacha's honor.

During his nearly 25 years as an APPA member, Tom Vacha served the association in many ways, including President-Elect, Vice President for Professional Affairs, and APPA Board member. He helped develop the criteria for the Facilities Management Evaluation Program and was a team leader on several FMEP evaluations. Vacha was a faculty member at the Institute for Facilities Management, and he was a frequent speaker and writer on numerous facilities topics. He was the author of the "Evaluating Facilities Organizations" chapter for the newly published third edition of *Facilities Management: A Manual for Plant Administration.*

Vacha served as assistant vice president for facilities at the University of Delaware since 1988. Previously, he held facilities positions at the Massachusetts Institute of Technology and Harvard University. He was a graduate of Northeastern University. In addition to his service to higher education, Vacha retired last year from the United States Army Reserve with the rank of Lieutenant Colonel, having completed 34 years of service.

Tom Vacha will be greatly missed within the APPA organization, and his spirit, strength, and determination will remain with us. 🔔

Tom Vacha's daughters accept the Meritorious Service Award in their father's memory.
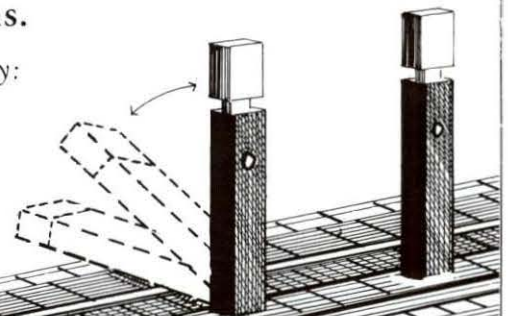
APPA Board Selects van der Have as New President

Following the July 8 death of President-Elect Thomas F. Vacha, the APPA Board of Directors selected Pieter J. van der Have to serve as APPA's President for 1997–98. Vacha's death occurred just one week before he was to have been installed as APPA President at the annual meeting in Orlando.

The Board selected van der Have, then serving a second term as APPA Vice President for Information Services, from a small pool of recent candidates for the office. Van der Have took office at the annual banquet July 15, which he dedicated to the memory of Tom Vacha. Because van der Have's selection left an opening for a vice president, the Board then selected Joseph D. Rubertone, director of facilities at Quinnipiac College (CT), to complete the current term of Vice President for Information Services. These actions do not affect the leadership cycle of President-Elect L. Joe Spoonemore.

Van der Have is director of plant operations at the University of Utah, where he has worked for more than 30 years. He has served on many APPA committees and has been active in the Rocky Mountain region, including president. He is a 1993 recipient of the Meritorious Service Award, APPA's highest individual honor, and a 1996 recipient of the President's Award for his leadership in developing APPANet, the association's Web site. A complete profile on President Pete van der Have will appear in the November/December issue of *Facilities Manager.* 🔔

Ron Flinn, left, passes the Presidential Gavel to Pete van der Have.

Two Associations Join Forces

CAUSE: The Association for Managing and Using Information Resources in Higher Education and Educom have announced their intent to join forces and create a new organization. Both groups' governing boards indicate that the missions and programs that have been pursued individually by the two groups will be much stronger with the formation of a new association. One of the major inducements for the merging of efforts was how well the programs of the twoorganizations complement each other.

The two organizations have worked closely for more than a decade and among their many joint projects was the formation (with the Association of Research Libraries) of the Coalition for Networked Information (CNI). If all goes as planned, the two organizations plan to begin operating as a new corporation on or about January 1, 1998. 🔔

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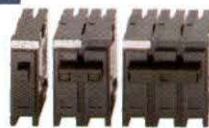
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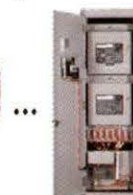
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CORPORATE CONTRIBUTORS

At the Orlando annual meeting, Ron Flinn and Doug Christensen presented special awards to these major corporate contributors to APPA's programs and services last year. APPA greatly appreciates their continued support. **1. Viron Energy Services** (APPA/DOE Rebuild America Partnership); **2. Johnson Controls, Inc.** (K-12 initiatives); **3. Evantage** (APPA/DOE Rebuild America Partnership); **4. Nalco Chemical Company** (support of forthcoming benchmarking toolkit; development of facilities trends video); and **5. Cutler-Hammer** (Institute redesign/software upgrades; Opportunity Assessment workshops).

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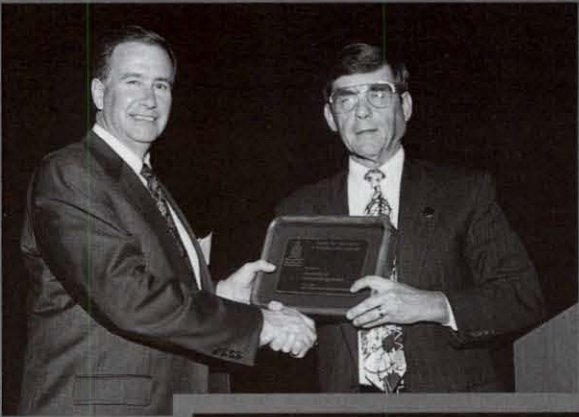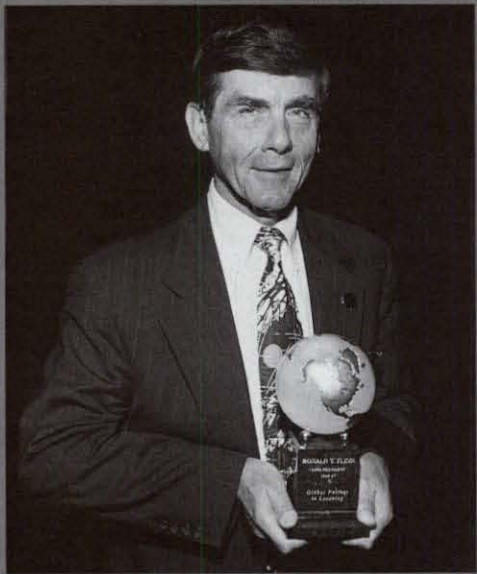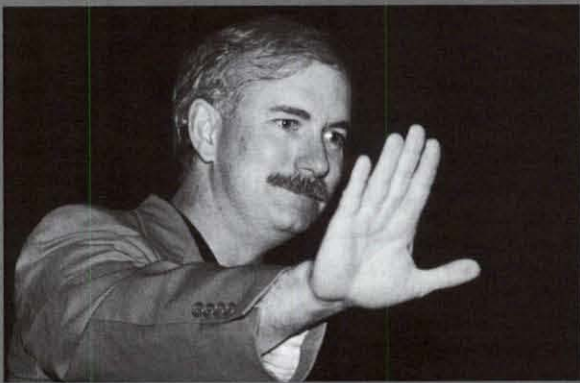
We had a great time in Orlando! 1. Leo Yanda, l, accepts the University of Arkansas' Award for Excellence from Ron Flinn; **2.** Flinn with President's Award recipients John Harrod, Clay Adamson, and Doug Christensen; **3.** Global Partner in Learning Ron Flinn smiles as he completes his year as President; **4.** The Jammitors entertain at breakfast; **5.** Banquet speaker Brian O'Malley speaks on personal challenge; **6.** Ron Flinn and Kevin O'Donnell celebrate APPA's partnership with PGMS; **7.** An enthusiastic crowd awaits the start of the TMA-sponsored Fun Run through Epcot; **8.** Customer enthusiast Roger Dow gives the keynote address; **9.** APPA's EVP Wayne Leroy introduces Brian O'Malley; **10.** Attendees discuss new products in the Exhibitor Learning Resource Center; and **11.** Members share a laugh during Dow's keynote.

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To create, promote, preserve, disseminate, and apply knowledge is the mission of every college and university. Yet, as we approach the next century, there is reason to reflect on the way that these roles will be fulfilled in the future.

I believe that as we move into the next century, we will be required to develop new ways of doing old tasks and we will take on new and different activities. As our institutions move to create an energy that will propel the institution forward to accommodate growth, changes in technology, and changes in the ways that basic programs are offered, the facilities managers will be challenged in ways never before imagined.

There are typically two types of facilities managers: the caretaker and the change agent. While both perform necessary tasks, the majority of caretaking functions can be outsourced, while the change agent functions represent value-added facilities management.

We can be assured of one constant as we move into the next century—change. Everything is going to change and we might as well get used to it. You can take the fatalistic approach and "make a wish/take a guess," or you can be a proactive change agent facilities manager and initiate change by improving processes, procedures, expectations, customer, and employee requirements.

Val Peterson is director of facilities management at Arizona State University, Tempe, Arizona, and a past APPA President. He can be reached at valpeterson@asu.edu.

So what do we have to do to accommodate these changes? We have to think cooperation, teamwork, partnership, and people. We have to think about quality and service, and about our customers. We need to stay updated and in touch. We should seek and welcome exchange. Our customers and employees have needs, and we must meet them. We have to prevent damage and excessive deferred maintenance to our facilities, and provide safe and healthful work places. Most of all, we have to provide quality service. Quality service at a competitive price is the watchword of the future.

Peterson's Prognostications

I have wet my finger, tested the winds of change, and now make the following prognostications of some of the many anticipated changes that will happen or will continue into the next century:

- Changes will affect both the manager and the managed, and emphasize teamwork and partnerships; the focus will be on the bottom line—meeting customer needs.
- Computers will continue to increase in storage capacity, faster speeds, and decreased power demands.
- Emerging microwave and satellite technology will allow the development of wireless hand-held computers with the same power of the desktop and laptops of today, and will increase the speed of data transmission as well as lessen the need for cabling and wiring.
- Basic Internet services will be considered a utility like phone service and will be just as indispensable.
- The next generation of Internet will dramatically increase the speed of university and laboratory connections, promote experimentation with new networking technologies, and demonstrate new applications.
- As things become more computerized, less paper will be used.
- Old technologies will be replaced with processes that provide better, easier, and more efficient ways of getting the job done.
- Products and equipment will continue to become more reliable with fewer breakdowns and less maintenance.
- More functions will become voice-operated such as computers, door openers, and parking gates.
- More emphasis will be placed on protecting the worker by maintaining a healthful environment and by using personal protective gear and products.
- As more functions are automated,

the number of permanent employees will decrease as temporaries increase.
- More staff will be certified in specific areas of expertise.
- Indoor air quality will become as important as outdoor air quality and monitoring of indoor environmental quality will likely take place.
- Changes will be made in the way work is done to reduce the repetitive stresses that lead to carpal tunnel syndrome, bursitis, and other types of repetitive injuries.
- Tools, equipment, and even work stations will be redesigned so that they are more ergonomic in nature.

Past Changes

Facilities managers need not be overly concerned about change, since they have already dealt with considerable change over time. Consider just a few changes that have taken place in the last couple of decades:
- computers have mostly eliminated such things as typewriters, adding machines, manual accounting and record-keeping systems, manual work orders, etc.;
- automation of functions such as building controls, boilers, chillers, irrigation systems, and remote operating controls have compensated for reduced staffing levels;
- a variety of equipment is now used to accomplish work once done by manual labor;
- stricter federal, state, and local mandates and code requirements have changed the way we build, remodel, and maintain facilities and related equipment; and
- the way we manage and work with our own employees and customers has changed dramatically.

Change Within the System

There are major forces of change in society today that will certainly affect the activities of all institutions of higher education. The most prominent changes in how institutions meet

their missions in the future will be brought about by:
- new technologies and the accompanying information explosion;
- life-long learning needs and changing demographics;
- the shift in higher education from teaching-centered to learning-centered organizations;
- societal demands on all institutions for accountability, efficiency, productivity, and value-added contributions;
- an increasingly competitive environment for education delivery and fiscal and human resource support; and
- the growing interdependencies between the college and university and its various non-campus constituencies and partners.

The preceding items apply to each institution of higher education as it manages its programs and resources to meet its various commitments in teaching, research, and public service. The spinoffs for facilities managers will be just as dramatic as they are for their institutions.

New Technologies

Traditional teaching methods will be replaced with technologies that provide more appropriate and efficient learning experiences as are expected and even demanded by today's more technologically-advanced students and employers. Students currently in the pipeline want hands-on experience by plugging into state-of-the-art technologies that allow for realistic experience and experimentation.

Today's faculty is continually pressed and expected to create new methods and more creative learning experiences, processes, and environments. The personal computer is becoming a necessity, rather than an extravagance. To meet the demands of these new technologies in teaching, considerable remodeling and renovation will be needed in existing facilities and new facilities may be

required to provide flexible teaching space and laboratories that can be reconfigured for different classes each day or with adequate "plug-in" capabilities to adapt to rapid changes in technology. Facilities managers will need to be plugged into these new and changing technologies to keep up with those changes on campus.

Life-Long Learning

The days are long passed when one could rely exclusively on the training received in college or a trade school. While colleges and universities are developing curriculum to meet changing educational demands, facilities managers will need to keep themselves and their staff in a similar mode of continuous training to keep up with the changing technologies in teaching, and in the physical plant itself. Most automated and control functions will be computerized and digitized. More functions will be automated and centrally controlled. Emphasis will continue to move from mechanical to electronic, and staff will need to be trained to operate and maintain equipment that functions in this mode.

Learning Centered Organizations

The shift from teaching-centered (lecture mode) to learning-centered (interactive technology) will entail a major shift in how classrooms and laboratories are used. Large lecture halls will function adequately only if the infrastructure will allow students to plug in their own laptop computers. Books and libraries will give way to computers and online databases. The need for conventional seating, stack areas, and storage will shrink. Initially, this will require electrical power and data connections within a few feet of anywhere a student might want to sit down and power up.

And it may not be just the lecture halls that require high-tech improvements. The demand will be within arm's reach of any seating area, including those in the cafes, lounges,

broad corridors, dorm rooms, mall benches, outside patio/picnic tables, etc. This increased usage will greatly increase the size of local area networks. Later on, the new microwave and satellite technology will allow students to operate from any location both on and off campus.

Accountability, Efficiency, Productivity and Value-Added Contributions

While faculty are fighting their tenure and teaching load battles, facilities managers will battle on other fronts to justify costs and ward off takeovers by the private sector. The public and governing boards are demanding accountability on all fronts. The issues of efficiency, productivity, and value-added contributions are certainly not new issues for facilities managers, but as these factors are scrutinized and justified at the highest levels, the "trickle-down" affect will be felt by all within the organization. Because these issues are not new to the facilities manager, there may be some advantage over areas that are plowing new ground.

Competitive Environment

In the future, the competition between colleges and universities may become quite keen. In addition to the quality of the "offerings," students will be looking at costs as well. Those institutions that can offer students a relevant education at a competitive cost will do well. Facilities managers will continue to be asked to provide quality services at bargain prices. But don't underestimate campus appearance as a recruiting tool. Even in a more competitive environment, students will still continue to make decisions on which college to attend by the appearance of the campus buildings and grounds.

Partnering

As colleges and universities develop relationships with various non-campus constituencies and partners, there will be an emphasis on developing these relationships up and down the organization. Cooperative efforts between facilities managers involved in the partnershipping can be very helpful to both. Sharing of ideas, methods, costs and other experiences in a non-threatening environment can allow both sides to gain insights and strengths. In addition, facilities managers would do well to investigate partnerships with other institutions located in close proximity where costs for certain types of equipment or costs for common services could be shared. In some instances, this could work for public institutions with other public agencies.

Meeting the Challenges and Changes

What does tomorrow, next year, or the next century hold for your institution, your facilities, your career, and your ability to provide a value-added function to your organization? The acceleration of change, particularly economic and technological change, is forcing the private sector to review the value of their various holdings, entities, and operations. The same thing will happen, no doubt, within higher education. Activities not considered part of the core mission will be candidates for elimination or outsourcing. Facilities managers will be challenged as never before to show how their organization adds value. The bright spot in all of this is that the need for maintenance will never go away. The demands on our profession, our experience, and our expertise can only increase. And that's another thing (luckily for us) that's not going to change. I am confident that as a profession, facilities managers will be up to the challenges and changes that are before them. 🔔

Strategically Planning

Managing Strategic Plan Implementation

by James O. Cole & Susan D. Cole

This is the fifth article of a series on strategic planning developed especially for *Facilities Manager* magazine. The fourth article presented the process of developing the broad objectives or desired results of a strategic plan, and then discussed how to determine strategies for reaching the objectives.

In this article we will complete our description of the plan development portion of the process and then discuss execution and implementation of the strategic plan. We will address questions such as, How can people be organized to carry through the plan? Who takes responsibility for what? How will we know if we are successful? And, finally, What measurements can we use to evaluate our progress?

Completing the Planning Process

The early phases of creating a strategic plan involve brainstorming thoughts and ideas about improving customer service and productivity, reducing costs, and being proactive about the future. It is quite a task to take all of these ideas and coalesce them into a set of objectives. But distilling, combining, and focusing ideas is critical to defining the goals of an organization. The next step is to describe exactly what is intended by each objective. Objectives are then broken down into their components and the scope of the objective is defined.

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The team then develops the strategies that will be used to reach the objectives. The process of examining the objectives and figuring out how to accomplish these goals leads to new ideas and serves to "flesh them out." The strategies for each objective consist of actionable tasks called "tactics."

Driving Strategies

Coordinating the efforts of the strategic plan and assigning tasks to individuals or teams is the first step in implementing the plan. Organizing execution of the strategic plan is an important "up front" activity for each component of the strategies. It is best to define some level of prioritization and timeline. There are several alternative ways for the Planning Team to drive the strategies:

• Assign a portion of the strategies to one or more teams. The teams may be homogeneous, that is, be composed of individuals who comprise a natural work group; or, the teams may be highly diverse, incorporating a cross section of the organization and even different hierarchical levels.

• Assign the entire strategy to a single team of employees representing a cross section of the organization.

• Assign all or a portion of a strategy to an individual who will accept responsibility and accountability for its completion.

• Distribute various portions of the strategy over organizational work units. "Local" work groups then establish the piece of the strategy that they will work on. For example: a trades team could become responsible for identifying those items to be preventively maintained and the frequency of the maintenance. The Strategic Planning Team should then describe the hoped-for end results and timelines. This would help the team organize itself and establish norms for accountability and responsibility, which would make it very clear how much authority the team will have and what resources will be made available to them.

After exploring the assignment—possibly including some education in the subject matter for the team members—the team would meet with the Strategic Planning Team to report progress and negotiate changes to the plan (that would be appropriate for the assignment as the team perceives it). It is always advisable to assign one of the Planning Team's members to serve in a coaching role for each individual team. This person can also be a liaison between the team and the Planning Team.

Measurement and Accountability

Regardless of the development and implementation process selected, the Planning Team must establish routine follow-up and progress-monitoring activities for each of the objectives

and strategies. For example, a quarterly review of progress can give a team the ability to assess themselves and change their direction if necessary. Focusing on identification of measures for key indicators is thus the next step.

The basic question to be answered in addressing measurement is: "How will you know when you are done?" The team needs to be very sure they know what the strategic change will look like. For example, an objective for a facilities management department strategic plan might be to achieve a 20 percent decrease of invested hours. This would translate into a 20 percent increase in productivity. In the crafts area, this might best be measured through hours per 1,000 renovation-dollars received. For custodial, the appropriate measure is probably a savings in the cost per square foot of served space.

A strategy for a facilities management organization has, in the past, been the implementation of routine preventive maintenance (PM) programs. The major categories of action within a strategy for this purpose might be: 1) acquisition of the funding for the program; 2) acquisition and installation of necessary software for tracking and driving PM activity, 3) characterization of PM frequencies, 4) implementation of the system, and 5) establishment of measures of performance and the system through which performance will be reviewed and monitored.

Measures of success would be aligned with each of the components of the strategy. For example, acquisition and implementation of software would be tracked effectively in terms of percent of milestones being successfully achieved and on time. For the characterization of PM frequencies, a relevant measure would be percent of maintainable items for which characterization has been completed.

Bottom-line results or an overall organizational performance can also be possible measures of strategic activity and results, but they are impacted by so many factors that it would be unfair to monitor strategic effort strictly on this basis.

Nonetheless, it is possible to monitor progress by the use of a time-phased plan. By developing a timeline for the team's progress, objectives, and strategies that don't lend themselves to numerical measurement can be tracked.

Two of the most powerful techniques for determining results and progress measures are the Performance Matrix and the Balanced Score Card. The Performance Matrix system takes the identified measures of progress and performance, weights them, and provides a scale for the measure of each. Once per month or quarter, the matrix is "scored" based on actual performance, and a single number is derived that represents the overall progress of the plan. This single result can be presented graphically and widely shared. Those areas where the organization is falling behind in performance or progress are easily identifiable and corrective action can be initiated. The Balanced Score Card approach is fully described in Kaplan and Norton's text of the same name.

Summary

One of the key failure points of strategic plans is getting the work done. There is often a conflict with the short-term, day-to-day, more urgent forces in the organization. Often the urgent takes precedence over the important. The best way to minimize this failure is to prioritize the goals to be accomplished, spread the workload throughout the organization, and provide a measurement system that is routinely monitored and made highly visible to everyone in the organization. To quote Dr. Eli Goldratt, author of *The Goal:* "Tell me how I am going to be measured, and I will tell you how I will behave." ▲

The Future

OF FACILITIES MANAGEMENT

by William A. Daigneau

W*hat is the future of higher education facilities management? What role will facilities executives play in responding to, or perhaps helping shape, that future? What skills and talents will be required of the facilities executive to play that role? What should associations such as APPA be doing now to help facilities executives, and higher education itself, prepare for the future?*

Tough questions! Peering into the future is particularly difficult, especially if you are trying to make decisions about your career path. Even more so if you are sincerely worried about the future of an institution and are trying to do something to ensure its survival and success. Or if you are trying to lead a profession in making a meaningful contribution to society.

Generally when we ask such questions our reaction will take one of two forms. One reaction will be to try to predict the future and then to plan a course of action based on that prediction. Another will be to conclude that the best course is to "cross that bridge when we come to it." In the first case, if we choose to lead we are faced with the risk of what Lawrence Wilkerson called in his article "How to Build Scenarios" the "long fuse, big bang" problem: "Whatever you decide to do will play out with a big bang—often a life or death difference to an organization—but it can take years to learn whether your decision was wise or not." If we opt not to lead but to follow, then we tie our fate in with those who are deciding and hope that they know what they are doing.

In both cases, we feel a lot of discomfort because, if we are truly trying to make wise decisions about our future, we are forced to deal with a world that is both complex and uncertain. And it's that uncertainty, whether it be about what we have decided, or about whether those we follow are making the right decisions, that creates the trepidation about the course we have chosen. As Wilkerson points out, "We confront a deeper dilemma: how do we strike a balance between

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Bill Daigneau is assistant vice president and chief facilities officer at the University of Texas M.D. Anderson Cancer Center, Houston, Texas. He is a cochair of APPA's Leadership Programs.

prediction—believing that we can see past these uncertainties when in fact we can't—and paralysis—letting the uncertainties freeze us into inactivity."

When trying to predict the future of facilities management one is forced to examine the core industry that it is inextricably tied to—higher education. How goes higher education will determine to a large extent the future of facilities management, correct? One could conclude that if higher education continues to prosper, the future of facilities management will also be quite rosy. Or if some reason higher education declines, then the role and purpose of facilities management will also decline. While this relationship would appear to be self evident, the validity of such conclusions might be dead wrong!

Why? Because the shape of the future higher education enterprise could evolve into something much different than its traditional structure, using methods of delivering education and knowledge that may or may not depend on the types of facilities it has relied on in the past. Such a fundamental shift in educational delivery, as well as the role of higher education itself in society would inevitably alter the need for its support systems and management requirements. This in turn would drive fundamental change in the need for facilities, their size, type, and location, how they are managed, and in the role of the facilities manager itself.

Such changes, if they should occur, would create a set of additional questions: What should we be doing today, in the management of facilities, which would allow our higher educational institutions to pursue and accommodate such changes? Additionally, what should we be doing ourselves, as higher education's professional facilities managers, to prepare for these changed management needs and perhaps a new role for ourselves in higher education?

The genesis of such questions began from what appeared to be a rather straightforward assignment for APPA Past President Doug Christensen, Brigham Young University, and myself to assist APPA's Educational Programs Committee by developing a strategy for developing and enhancing APPA's programs in leadership. At first, a comprehensive preview of the current curriculum with recommendations for adjustments were thought to be adequate. But one nagging question kept surfacing. What skills and knowledge does a

facilities manager need to lead, now and in the future? That in turn led to many of the questions offered above. We felt uncomfortable charting a leadership program without understanding what we were supposed to be preparing people to lead, and to where.

To deal with this dilemma, we decided to invite a group of senior facilities executives, facilities managers, consultants, association leaders, and industry representatives to a weekend retreat in Atlanta, to discuss the following:

What will the future be like for higher education?
- What forces will affect higher education in the next decade?
- What is the probability that these forces will have a material affect?
- What are the most critical forces?

These forces will drive primary factors which determine the size and shape of higher education: What are they?
- What are some scenarios which institutions most likely deal with?
- What strategies can be employed to contend with these scenarios?

How will these strategies affect demand for facilities?
- Type.
- Size.
- Location.
- Characteristics.

To accomplish this task I suggested we employ a scenario planning technique that I had used in making facilities decisions at my employer, the University of Texas M. D. Anderson Cancer Center.

The Methodology

Scenario planning techniques start from the simple premise that while change is certain, the form of that change is uncertain. Therefore, trying to predict the future is futile. Instead, one is better off trying to understand the forces that will shape the future and to then create "stories" or scenarios of how these forces might combine and what the resulting future might look like. It is these stories that allow one to test various strategies or decisions in a risk-free setting. Seeing the potential outcome of decisions under different scenarios helps the organization learn how to adapt under different conditions, knowing better what will likely work and what will not. As the future unfolds, one is better able to "read" emerging trends and deploy the pretested strategies, way in advance of any other organization. Thus better decisions and outcomes are obtained.

Using this technique, the group proceeded to identify over 160 forces that are, or are likely to affect our future. These forces were categorized into five major groups and then rated on the level of certainty the factor would affect the future as envisioned. This list was then prioritized as to which forces would have a significant impact on the future, especially as they would affect higher education. Certain primary themes emerged as the group identified the critical factors. Briefly, the central themes were the following.

- Information Technology. Even with the dramatic advances in information technology we have seen over the past decade, some prognosticators have said we are only at the dawn of the information age. The group identified information technology as having not only a great impact on educational delivery, but was also highly probable to occur.

- Resource Scarcity. The group concluded that the competition for resources to support all of society's needs would continue to be a major force in the future. Education at all levels will most likely be a high priority as it has in the past, but the public's demand that resources be used effectively and efficiently would most likely be a major factor. In addition, the emergence of a global economy, changes in historical business cycles, shifts in the distribution of wealth, and market reactions to ever increasing consumerism would most likely drive all segments of service providers to prove the value of their products.

- Societal Changes. In America we discuss constantly the changes in society that have and continue to occur. Increased immigration, the effects of the baby boom generation, changes in traditional family structures, and the increasing frustration and anger evident in society are major forces that will affect the future.

- Role of Government. The societal changes noted above will in turn affect the role that government plays in the future. The group felt that government will be expected to shepherd the public's tax dollars in a way that maximizes society's expectations and needs. The public's demand for accountability will also pressure greater governmental oversight in the use of tax dollars.

- Environmental Deterioration. A growing global population will continue to stress the earth's natural resources, the group decided. This will lead to continuing depletion of energy resources in all forms, increasing air and water pollution, and ever increasing demand for products derived from forest, agricultural, and mineral resources. Such forces will in turn affect the other forces identified above, primarily governmental control, resource availability and distribution, and societal needs. The direction and degree of change in each of these major forces were thought by the group to be primary determinant of the future. Likewise, higher education's response to these forces would also determine its future. In traditional planning and forecasting techniques we would now make assumptions about these forces and proceed to define a single future. However, the power of scenario planning is to make no assumptions about future direction or magnitude, and instead create stories about how these factors might combine in order to better understand the possible outcomes.

The Scenarios

Four scenarios were developed by the group to better understand how different futures would affect facilities and facilities management. From this understanding the group eventually looked to discover common threads which will define for us the role the facilities executive might play in helping higher education deal with the future. While space limitations do not permit us to present the full text of the four scenarios, they are graphically summarized in Figure 1.

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                    VALUE ADDED
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  El Moro                │  University Without Walls
  • Stable Enrollment    │  • Distributed Learning
  • Traditional Campus   │  • Natural Educational Centers
  • Costs Managed        │  • Resort-like Campus
                         │                    INFORMATION
◄────────────────────────┼────────────────────►
                         │                    TECHNOLOGY
  Blue U.                │  Tech-No U.
  • Constrained Resources│  • IT Bypasses H.E.
  • Campus Decay         │  • Shrinking Resources
  • Traditional Education│  • Stiff Competition
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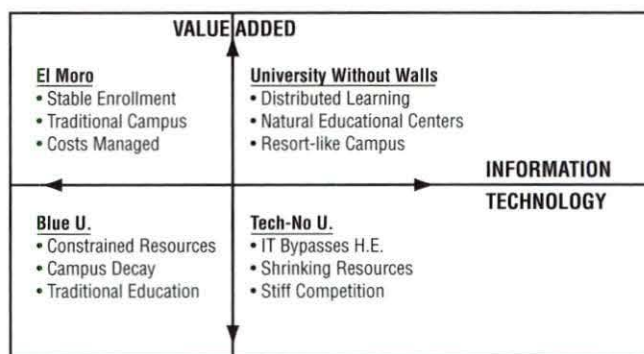
The Role of Facilities Officers

When the group looked at the scenarios it identified some important roles that the professional facilities executive could or must play to improve higher education in the future. While the following items are not exhaustive, they do reveal at least the framework for future leadership by our profession.

• Operations. In three of the four scenarios, there is a definite emphasis on operational efficiency. This is probably an area in which the current facilities manager is most comfortable. But operational efficiency in the sense we have traditionally known—shaving utility costs through energy conservation programs or cutting custodial costs through industrial engineering techniques—may not be sufficient. Some areas discussed by the group included negotiating energy supply contracts amongst multiple suppliers with varying terms, outsourcing for maximum value, not just cost, and using sustainable designs to minimize waste. But even more valuable may be the expertise to improve efficiency through analysis of operations, redesign of basic processes, and selection of the most cost-effective delivery system, not only in facilities management but in other campus operations such as telecommunications, transportation, residence hall management, food service, retail operations, and other campus services. The only limiting factor may be what we define for ourselves as the limit of our ability and expertise.

• Strategist. All of the scenarios seem to suggest a continuing need for critical facilities management decisions. Where will these come from? For example, if a solution to cost reduction is to improve facility utilization, who will bring this issue to the attention of senior management? Who

will champion a "lease" versus "own" decision if that is the only reasonable means to provide an essential facility? Who will suggest the divestment of unneeded buildings so resources can be redirected to more mission critical activities? These questions involve development of a strategy to position the alignment of facilities resources with the emerging needs of a college, probably even before those needs become self evident to the institution's senior executives. For the facilities executive, the role of strategist becomes ever more important. That is, devising the range of solutions a college may deploy beyond those it is traditionally conditioned to think about. And we in higher education are not alone. A recent article in *Building Operating Management* by Edward Sullivan titled "Facilities Become Mission-Critical" comments on the changing facilities executives role: "As facility executives become more focused on broad corporate goals like productivity, traditional roles and boundaries begin to disappear. Salaries and bonuses may be determined less by the number of square feet in a portfolio than by the amount of space a company has shed. For executives responsible for the most tangible of assets, that shift may be unnerving."

• Industry Partner. In these scenarios there is a reoccurring theme of industry involvement in the higher education enterprise, either as supporter or supplanter. Most of us in the facilities business, especially the public institutions, have traditionally maintained our relationship with business as an arms-length, prudent buyer. Even when our institutions solicit business for their financial support we are careful to preserve the institution's "independence," whether it be in research, sports, or academics. Preserving such independence while yet building new and perhaps unusual partnerships with industry will be challenging. This suggests a higher level understanding of the institution's strategic interests as well as well-sharpened negotiating skills. Even if the relationships continue as they have in the past, it is probably certain the facilities executive will look to its external suppliers of goods and services to become more involved in innovative problem resolution, beyond the simple response to a RFP or bid specification. This will call upon leadership in structuring new business arrangements, perhaps spanning many years.

• Asset Manager. In all the scenarios, we see a continuing emphasis on facilities, either to support dramatic changes in educational delivery or to preserve and enhance mission achievement. The deployment of capital in bricks and mortar or technology will require executives who can understand the concept of asset management from a financial perspective. Who within higher education will suggest where scarce capital should be deployed? Who will complete the analysis of the range of options of how best to meet a programmatic need with regard to providing the necessary facilities? These are questions related to not just

maintaining a campus, but *managing* its capital assets. The degree to which the facilities executive can help direct an institution toward the optimal deployment of its assets will likely become increasingly important. Future emphasis will likely be on financial analysis, real estate knowledge and skills, property management, capital budgeting, and an understanding of capital sources and uses.

• Information Technologist. Information technology (IT) will have a significant impact on higher education although the pace and direction is still unclear. The scenarios uncover the potential for a rather radical change if we continue to witness the same advances that we have experienced over the past decade. While facilities management has traditionally focused on space, its creation, operation and maintenance, the amount, type and location of space in the future will undoubtedly be affected by IT. This implies that the application of this technology will be increasingly a matter of concern for facilities managers, just as we have learned to deal with other issues such as energy management, environmental protection, ADA, and other externally imposed forces. An understanding of this technology in both its potential and its limitations, will be a necessity for the facilities manager in the future. From simply deciding what the capacity and configuration of the cable plant should be, to helping design and operate workstations, learning centers, and production and transmission facilities, facilities management will be looked upon to make the "right" decisions. A working knowledge of the technology and its application will be an increasingly important requirement for facilities managers.

• Executive. During the group's sessions, one of the participants lamented his inability to get senior management's attention about critical facilities issues on his campus. His statement, "Even if we do all the things we should be doing, how do we get them to listen?," reveals an important and telling shortcoming in our profession. To lead an institution in the solution of these issues, facilities managers must truly become facilities executives, having at hand both the tools unique to our profession as well as those common to executive decision making. This will undoubtedly require that we develop our abilities to see the big picture and frame our plans and solutions in the context of what is best for the organization, not just its facilities. It will also require abilities to make concise and meaningful presentations, to write and

speak well, and be able to handle the "politics" of difficult situations or negotiations.

Although the group wrestled with several other issues related to the needed skills and knowledge required for future facilities management, there appeared a growing consensus that higher education's success will be aided or hindered by the quality of its facilities and capital decisions, and those that are entrusted to make such decisions.

What Next?

Interestingly, as the scenarios and their implications emerged, there was a growing sense of urgency by the members of the group to stop the "abstract" exercise and to start developing strategies to deal with the implications. One member, obviously nervous that we would leave Atlanta without a tangible result, proposed that the group "spend the last two hours to devise specific actions and recommendations." Another wanted to work on a business plan to develop new leadership programs for APPA. Yet a third promised to send a book that would provide insight into the solutions and directions we should pursue (he later did, with a note attached saying "Read this!"). Such reactions are normal and understandable. They go to the heart of our problem-solving nature. But while it is comforting to think that a small group of intelligent, capable facilities management leaders, working over a weekend in Atlanta, could prescribe fixes for higher education's future problems, it is

nonetheless unrealistic. Faced with the harsh cold reality about the complexity of the problem of what we should do as a profession to serve higher education in the future, the group concluded that more focused work was needed. But focus on what? If we sincerely believe the success of higher education will in part rely on improved facilities management and decision-making, how will this be accomplished? Where will the leaders come from to help develop and implement these improvements? These are but two of many critical questions. To deal with such questions, the following steps were proposed.

1. Consider development of an APPA Leadership Center. A conceptual model for such a center has been approved by APPA's Board of Directors. The center might become for the association its own version of a Rand Corporation, a group dedicated totally to identifying, researching, and proposing development of management tools, techniques, and educational programs on emerging issues important to higher education with respect to facilities management. Led by a council composed of leading facilities management "thinkers," the center would pursue some of the issues raised by the scenarios and perhaps develop its own, more robust ideas about the role of the facilities executive in higher education.

2. Consider alliances with other associations, foundations, and academic programs. One member of the group proffered the view that APPA could not, and should not, offer facilities managers an MBA program. Probably not, but we could consider what is taught in such programs and perhaps help build a supplementary curriculum to support the unique area of facilities management, just as many programs now provide tailored MBA level emphasis for the banking and manufacturing industries. We can also pursue alliances with associations that already are well developed in some areas where we are not, such as property management and real estate. Future alliances with other associations might help us with delivery of some programs such that our

resources and focus are better directed to the key strategic issues of higher education.

One final note: The author wishes to personally acknowledge and thank the exceptional group of facilities, higher education, and industry professionals that joined me in Atlanta over that April weekend. Covering their own travel and lodging expenses, they devoted a weekend from their families and otherwise busy schedules because of their belief in the importance of our profession, our role in it, and their own commitment to our future success. If this is any evidence of our ability to lead, then I am confident we are in good hands. ♦

STARTING OVER:
Is It Time to Restructure the Way We Manage Higher Education and Its Facilities?

by Brenda N. Albright and William D. Middleton

Editor's note: *At APPA's 1997 Educational Conference and 84th Annual Meeting held at Orlando, Florida, during July 13-15, Brenda N. Albright and William D. Middleton took a look at the new and changing forces affecting higher education and discussed restructuring the ways in which higher education and its facilities management units are organized and managed that could bring about fundamental change and improvement in the productivity of higher education's physical facilities, and the efficiency of their maintenance and operation. Brenda Albright is a higher education consultant, a former deputy executive director for the Tennessee Higher Education Commission, and former vice chancellor for administration and finance with the University of Maryland System Administration. Bill Middleton is a facilities management consultant, a former chief facilities officer for the University of Virginia, and served as APPA President during 1990-91.*

This presentation concluded with responses from a distinguished panel of facilities managers, each with a very different background and position in the profession, who discussed their reaction to these ideas, and how their institutions and systems are already responding to the demand for change. Unfortunately, due to space limitations, we are unable to include those responses here. However, due to the excellent and varied responses of the panel—as well as the enthusiastic and positive response from the Orlando audience—APPA will publish the expanded discussion in a monograph in early 1998.

Resource Issues in Higher Education

Brenda Albright began the session with a general discussion of the resource issues and forces currently facing higher education, and some of the new initiatives that are emerging as responses.

In a recent *Forbes* article, Peter Drucker talks about the importance of intellectual integrity—being able to see the world as it is, not as you want it to be. Drucker says that when leaders have intellectual integrity, they know where to focus their energies and actions. Today, we want to address two questions: What are the realities facing higher education? And, where should higher education leaders, particularly facilities managers, focus their energies?

"Seeing things as they really are" tells us that higher education's funding and operating environment has changed. Two underlying forces for these changes recently identified in Pew Roundtable *Policy Perspectives* are: conflicting demands on public revenue/a diminished sense of public good and rising market forces.

Conflicting Demands on Public Revenue: A Diminished Sense of the Public Good

While all public opinion polls show that education is highly valued, over the long term, this value has not translated into strong financial backing. In the past year, robust economies in many states have resulted in increased support for higher education (an average of 5 percent in 1996–97). But the longer and more pervasive trend is the decline in higher education funding as a percentage of states' budgets, which has occurred in all but three states. Throughout this decade, many institutions have been through a period of cutbacks, in real terms, of public support. New York's higher education appropriation grew only 4 percent in a ten-year period. In California, state spending for corrections increased 25 percent from 1991 to 1994, while funds for higher education declined by 25 percent. States have made a fundamental shift in state priorities toward greater support of medical spending, K-12 education, and corrections programs. In addition, political pressures to cut taxes are widespread.

Higher education is under fire for not addressing rising costs to students, quality, states' needs, and productivity. Many private and public institutions have turned to the student to make up this loss of state resources, and nationally tuition has increased three times faster than the consumer price index. With more than three-fourths of Americans are concerned about rising tuition, political leaders are demanding that higher education halt the dramatic fee increases, and, in states where higher education leaders have been slow to respond, tuition restraints are sometimes legislated. Cost issues are making headlines: One popular columnist's sound bite is "American higher education in a curious balance: Price goes up as prestige comes down," *Time* magazine's March 17, 1997 cover article was "Why Colleges Cost Too Much," and the *Wall Street Journal* reports that higher education's cost is rising at an alarming pace.

Within the past few years, numerous leaders have sharply criticized higher education. Peter Drucker decries the rising costs of higher education and says that "such uncontrollable expenditures, without any visible improvement in either the content or the quality of education, means that the system is rapidly becoming untenable. Higher education is in deep crisis." Former Treasury Secretary William E. Simon criticizes colleges and universities for the "dumbing down of higher education." Some believe that this biting, harsh public censure is a factor in the lowering of priority for higher education in state budgets.

These criticisms and conflicting pressures at the state-level are spawning new financing approaches Much of higher education has moved slowly in changing funding and operational policies, and many political leaders believe that current policies are obsolete and non-responsive to productivity, state and national fiscal realities, quality, service, and educational goals. The growth of legislatively-mandated performance measures in the budget process underscores this political belief.

A 1997 study by the State Higher Education Executive Officers shows more than half the states (30) report performance measures in the state budget process. An emerging and growing trend is legislatively mandated initiatives that apply to all state agencies. In the last few years, about ten states have turned to a mechanism called "performance funding," and several other states are investigating whether to do so. The rationale for performance funding is straightforward: In allocating money to public higher education institutions, most funding systems do not provide incentives for institutions to improve program effectiveness, educational quality, or student-learning outcomes. In other words, they do not link funding to specific results or success.

Performance funding changes the funding equation by altering educators' expectations that programs or institutions are entitled to a certain level of resources; instead, it creates rewards for achievement and changes in institutional behavior. For example, traditional systems provide funding based on the number of additional students a campus enrolls or on faculty-student ratios, while performance-funding systems emphasize results, processes,

customer service, quality, and productivity. How effective was the institution in graduating students? How did students perform on licensure exams? Did the campus provide the necessary courses so students could qualify for postgraduate studies? Did the institution keep tuition and fee increases reasonable?

For most states, performance measures are indirectly linked to the budget, however, for seven states (Colorado, Florida, Kentucky, Missouri, Ohio, South Carolina, and Tennessee) there is a direct linkage with funds allocated to institutional performance on goals and measures. With the exception of Tennessee, states have a limited track record—all programs have been implemented in the past four years. Performance based funding is mandated by statute in about half of the states. Performance based funding represents about 2 to 3 percent of the overall support for higher education, but for some states a relatively large percentage of the increase in the last year. The proposed South Carolina program with 100 percent of funding tied to performance is an exception.

"Seeing things as they really are" tells us, first, that higher education can no longer depend on state government and students' largess to finance its operations. Throughout the country, higher education has been targeted with the same message: Higher education is valued and appreciated, but budget realities have almost eliminated the opportunities for significant budget increase. Meanwhile, demands for a well-trained workforce continually grow in response to global competition. In short, a better product must be produced with the same amount, or in some cases, less money.

Second, "seeing things as they really are" tells us that financing and operating strategies are experiencing a client-centered paradigm shift. Rather than the state or student meeting the institution's needs, the college or university must meet the state's or students' needs.

Third, "seeing things as they really are" tell us that higher education must be proactive in recapturing credibility and support from the public it serves.

Rising Market Forces

Within the past 15 years, the for-profit educational sector has grown tremendously. Pew's *Policy Perspectives* projects a "second wave of entrepreneur" organizations that will build on the educational and entertainment potential of electronic technologies, creating products and services attracting learners who are accustomed to shopping for services. The report states that the " . . . near monopoly that traditional institutions of higher education have enjoyed in the provision of postsecondary educational and credentials" is at risk and "emerging in its stead is a commodity market in which an increasing proportion of students are buying their education 'one course at a time' from a variety of vendors, which these students consider principally as 'outlets' for educational services."

Some futurists echo these sentiments about technology and how it will affect higher education is a more dramatic fashion. Drucker recently said, "Thirty years from now the

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big university campuses will be relics. Universities won't survive. . . .Already we are beginning to deliver more lectures and classes off campus via satellite or two-way video at a fraction of the cost. The college won't survive as a residential institution. Today's buildings are hopelessly un-suited and totally unneeded."

The Pew report suggest that to be successful in this new environment, higher education institutions must become more entrepreneurial and market-driven. Drucker describes it as a survival issue: "Innovation—making the business of tomorrow—starts out with the conviction that the business of tomorrow will be and must be different."

Initiatives such as responsibility centered management and budgeting, outsourcing, and privatization are emerging and growing responses to market and client-centered forces. In responsibility centered management and budgeting, au-thority is delegated to schools or departments (responsibility centers) which receive the income they generate and are responsible for the full costs of operations.

While responsibility centered budgeting is relatively new and not widely practiced in public higher education, several large independent campuses, including the University of Pennsylvania, Stanford, and the University of Southern California have used it for more than a decade. Through decentralization of decision-making to the responsible units, costs can be matched with benefits, and responsibility can be matched with authority. Responsibility centered budget-ing makes all parties more cost and value conscious when tradeoffs among various alternatives are clearly on the table.

Drucker has described the growth in outsourcing in busi-ness and government agencies and predicts that in another 10 to 15 years, organizations may be outsourcing all work that is "support" rather than revenue-producing and all ac-tivities that do not offer career opportunities into senior management. He predicts that for many organizations, a ma-jority of the people who work for it might be employees of an outsourcing contractor.

Higher education must respond to these emerging market forces by becoming more entrepreneurial in this highly com-petitive educational environment and by using those "classic" strategies that work. Build on strengths: do better what you already do well. Embrace change: view it as an opportunity, rather than a threat. Be results-driven: ask whether you're improving and putting resources where the results are. Balance the short and long term: ask yourself if you are making decisions for yesterday rather than today or tomorrow. Use pilot approaches: test concepts and strategies so that flaws can be corrected. Try new approaches: avoid spending too much time patching up the old. These "clas-sic" strategies may indeed make a difference in the quality of what we do.

Managing Facilities in a New Environment
Bill Middleton followed with a discussion of how these resource issues and new initiatives in higher education can and should affect facilities management.

It is time to stop tinkering with our facilities organizations and procedures to try to make marginal improvements, and to begin thinking far outside our normal boundaries about ways that we can very fundamentally change the way we provide facilities services, and the ways we and our insti-tutions manage our facilities.

As Brenda has discussed, higher education today faces some extraordinary resource constraints. No one can be more aware of this than the facilities officer. Beset by a "no new taxes" mindset, even as needs are growing, governments are reducing their support to public higher education, while increases in tuition and fees are constrained by the ability of the higher education market to pay them.

The 1950s and 1960s were a great growth period for high-er education that saw an enormous expansion of its physical facilities. Today, the facilities officer is faced with a need for major renewal, replacement, or repair of these now aging facilities, and we don't have the resources to do the job. In 1988 the landmark APPA/NACUBO/Coopers & Lybrand research report, *The Decaying American Campus: A Ticking Time Bomb*, helped to focus widespread attention on the magnitude of this deferred maintenance and capital renewal problem. But despite all that attention, and the very real achievements it made possible, last year's new study com-pleted by APPA and NACUBO, with support from Sallie Mae, published earlier this year as *A Foundation to Uphold*, indicated that the deferred maintenance issue is an even greater one today, almost a decade later.

All of this has convinced me that just making a better case for resources, or further gains in the efficiency and produc-tivity of facilities management functions, important as those may be, will not by themselves solve the problem. The truly successful facilities manager of the next decade will be someone who is able to assume a leadership role within higher education institutions to bring fundamental change to the way we manage, assign, and utilize facilities, as well as fundamental change to the way we conduct the functions of facilities management, or even the traditional scope of what those functions are. In short, the successful facilities manager of the future will be a visionary and a leader who can create a climate for fundamental change and innovation in all aspects of an institution's facilities program.

But the kinds of things that facilities managers can do and are effectively doing on a continuing basis to seek improved efficiency and productivity for their facilities organization are, in a way, only working at the edges of the basic cost problems that confront higher education today. So long as we in facilities management concern ourselves only with the change and improvement that can enhance the effectiveness and performance of our own facilities units, we are going to see only relatively marginal gains. Through improved train-ing, the application of more productive equipment, or the adoption of improved work procedures we might reduce the cost of one service by 10 percent, another by 5 percent, and perhaps still another by 15 percent. Higher education needs much greater cost savings than these.

Towards More Efficient Facilities Utilization

Facilities usually represent the greatest single cost of higher education after faculty salaries, and higher education is going to need far greater gains than these in its facilities costs. This can come only through fundamental change and improvement in the way we assign, utilize, and manage our facilities assets in colleges and universities. Generally, there isn't wide appreciation of the issues, or a good understanding of what kind of changes are needed, among higher education administrators. Consequently, facilities officers are going to have to become extremely well informed in this area, and may well have to become the visionaries and the leaders of change within their institutions for the way we use our facilities.

All of us in facilities management have a very keen appreciation of what it costs to acquire, operate, and maintain the facilities of modern higher education. When we put all of these costs on an annualized basis they are sobering indeed. Let's just suppose, for example, that the sophisticated new classroom building we just completed cost us $200 per gross square foot to build, and that we had to borrow the money on a 20-year mortgage at 6 percent to finance it. This would mean that our new building is costing us $17.19 per square foot every year just to have it. Typical costs for utilities, maintenance and cleaning for a building of this type might add another $5.50 per gross square foot annually, for a total ownership and operating cost of about $22.69 per square foot every year. Put another way, a 600-square-foot classroom in this building is going to cost us more than $13,600 every year to own and operate. A small part of those costs might vary slightly with the level of use, but basically that's what the room is going to cost us, *regardless of how much or how little we use it.*

Within a typical college or university management structure, the users of most of our facilities are not directly concerned with these costs, which are centrally budgeted to the facilities unit. Under this arrangement the user has no direct financial incentive to achieve high utilization of teaching space or other assigned facilities, or to make available for other uses those facilities which may no longer be needed. Consequently, much of our classroom space inventory stands idle outside a fairly narrow band of preferred teaching hours, and assigned office and research laboratory spaces in excess of current needs are jealously held, since they may be needed again some time in the future.

Responsibility Centered Management and Budgeting

I was delighted to hear Brenda talk about the growing interest in some form of responsibility center budgeting in colleges and universities. In the ideal world of financial accountability that this could produce I would see all of the resources going directly to the academic units, which would then become responsible for all of their costs. The facilities unit would no longer have an allocated budget, but rather would function as a sort of landlord or property owner, charging annual or hourly rates for facilities sufficient to produce the income needed to maintain them, and even to amortize acquisition costs. Utilities and other services would be provided on a reimbursable basis. This has to be done with real money, with the responsibility centers able to redirect the money they don't spend on some things to others that are more important to them.

I am convinced that such an approach would help us to significantly improve the overall utilization of facilities, and thereby reduce the needs for new construction. Classroom utilization, for example, might be greatly improved by such pricing tactics as "time of day" pricing that offers space at a lower cost in less popular class periods, just as airlines sell seats at less desirable travel times or seasons. An academic unit with excess office or laboratory space will have an incentive to release it to others who do have needs, and to utilize the budgeted funds for other requirements, or perhaps to sub-lease it to others pending an increase in their own space needs.

Let me give one fairly easily implemented example of how this might work to improve the utilization of facilities. In most colleges and universities, storage space is made available to its users at no direct cost. One result of this is a proliferation of obsolete equipment and unneeded material in dead storage, and a seemingly neverending demand for still more storage space. Simply by placing this space under central management, and assessing its users an annual charge per square foot for the space being used is likely to encourage a more realistic appraisal of what really should be retained for future needs, and what should be disposed of, with a substantial net reduction in the need for storage space.

This responsibility center approach could easily be carried as far as creating a "spin off," entrepreneurial facilities organization. In this scheme of things I visualize the facilities unit as a semi-autonomous one, much more self-contained than at present, that acquires, operates, and maintains facilities for its academic customers, charging them for space and services at market rates. This facilities organization, as the "owner" or property manager of the institution's facilities, would be responsible for their upkeep with revenues from their users. For virtually all other facilities services the customer should be free to buy them from the facilities unit or from external providers, wherever that "best value" service can be found.

Outsourcing

Outsourcing is on everyone's mind these days. Some regard it as the best answer to almost any service requirement; others oppose it. It isn't that important whether a service is outsourced or provided by internal staff, but that the presence of competition is what really matters.

Brenda spoke about the growing interest in privatization that is a response to the market-oriented and value-conscious forces faced by higher education today. While the idea of any privatization at all can be an emotional topic for many facilities managers, it is something that we all need to consider very carefully and objectively. The guiding princi-

ple should always be, simply, what's the best way to get the institution's work done at satisfactory levels of quality and responsiveness, and in the most economical manner? My own experience suggests that privatization can sometimes be the best way to acquire needed managerial and technical skills, or staff training and development resources that are not available, and cannot be readily developed, at the institutional level. Often, just the willingness to consider privatization can be a good way to demonstrate to our customers the effectiveness of the way we are currently providing service.

Far more often than just a decision to privatize or not, however, one of the potentially most fruitful areas for beneficial change lies in converting our facilities organizations from protected monopolies into business-like units in which competition with external service providers is present on a continuing basis.

While conventional wisdom in the political sector, and sometimes within higher education administration as well, often holds that the private sector can always do it better, faster, and cheaper than a public or institutional workforce, my own experience tells me that "it ain't necessarily so."

Rather, I have come to fully share the view put forth by David Osborne in his book, *Reinventing Government*, in which he establishes the basic guideline, "whenever possible, inject competition into public service."

Osborne cites the experience of the City of Phoenix, which pioneered this approach to public service in the

1980s. According to the city's auditor, Jim Flanagan, the important distinction is not public versus private, it is monopoly versus competition. "When there is competition," says Flanagan, "you get better results, more cost-consciousness, and superior service delivery."

What I suggest, then, is not that we set out to "privatize" everything, or even anything at all, but rather that we set up procedures under which real comparisons can be made between the cost, quality and responsiveness of facilities services or functions provided by the internal workforce versus outside providers. This can be on a project-by-project basis for minor construction, renovations, or repair work, or it can be conducted periodically for maintenance services such as custodial care, grounds maintenance, or the maintenance and operation of plants and equipment. These comparisons should be made on a timely and formalized basis that gives our customers the opportunity to easily choose the best service provide, and that is demonstrably even-handed and objective.

This *can* be done, and there's a growing number of higher education institutions and government agencies at all levels that are now reaping the benefits.

Entrepreneurial Operations

We need to become far more "entrepreneurial," to use a much overworked word, in the way we operate our facilities businesses. There are great opportunities for us in simply expanding the nature and range of services that we provide

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to our higher education customers. Just because of the increasingly complex and sophisticated nature of the systems and equipment that we already install, operate, and maintain, most of our facilities organizations now have a truly impressive technical competence.

Yet at many institutions a surprisingly large volume of service and repair work for a wide variety of research, teaching, or health care equipment is being farmed out to service contractors, simply because an internal organization has never been established for this purpose. We should begin knocking down the facilities-related boundaries to the work we do and start looking for other opportunities to provide technical services that our staffs have, or can readily develop, a capability to provide. There's a real opportunity here for cost savings to our new customers, as well as a chance to develop a more cost-effective facilities organization through "growing" our productive base.

Similarly, we should begin thinking about breaking down some of the bureaucratic "stovepipe" organizations that we have in most institutions, to create broader-based, comprehensive service organizations that can serve our campus constituencies far more effectively than can a larger number of more narrowly-focused specialized units. I'll cite just one example.

Most institutions today deal with their information and telecommunications infrastructure in a separate computing and communications unit, while other facilities and utilities services usually belong to a traditional facilities department. As these needs become more complex and pervasive, our customers encounter greater and greater difficulty in obtaining the complete support they expect when separate traditional facilities services and telecommunications units are involved. A single, comprehensive service organization that is capable of providing the full technical infrastructure needed for modern facilities projects should be able to do it in a better-integrated, more cost-effective and code-compliant manner.

In developing these more entrepreneurial facilities units, there are often opportunities, too, for marketing the services and the professional and technical skills that we have developed to external, related customers, being always mindful of the need to avoid unrelated business income problems for our institutions. Can we provide our specialized facilities management or maintenance services to, for example, a local community college or school district? It could be a winning arrangement for both parties.

Let me cite a few examples of what I mean from the recent experience of the facilities management organization at the University of Virginia. Several years ago the facilities management work management unit marketed its facilities assessment services to a nearby community college, and has been managing the college's preventive maintenance program for some five years now. The construction management unit provided construction inspection services for a city parking garage and several city and county public school projects, while the operations unit has taken on such specialized tasks for the county as sign fabrication and cabinet making that utilized equipment and capabilities that the county didn't have.

The Concept of "Best Value"

As we shift the provision of services to a competitive environment, I put forth the idea here that we should be looking for the "best value" for our customers and our institutions. A widespread attitude that I've observed on the part of workers in a monopoly environment is that they prize quality of work above almost all other considerations. While the highest possible level of quality is always nice to have, it doesn't necessarily represent the "best value' to our customers.

Just as price alone is not necessarily the best and only criteria for selecting a provider, neither is quality. What we should be looking for is the best combination of price, a product or service quality that will satisfactorily serve the requirement, and an acceptable level of responsiveness. This is what I would define as "best value."

TRENDS

IN FACILITY MANAGEMENT TECHNOLOGY

The Emergence of the Internet, GIS, and Facility Assessment Decision Support

by Eric Teicholz

Facility management technology has evolved through a number of "generations," with each generation representing a significant departure from the previous one. The first generation can be characterized as discrete: applications such as CAD, CMMS, and asset management existed as "islands of automation." With the advent of more powerful PCs, a new CAFM generation was born, whereby applications were integrated and shared information on a single dedicated CAFM installation. As networks and client-server databases evolved, a third (and current) generation of CAFM emerged which enables the disbursement of a wide range of FM and support applications throughout the organization. We are now poised on the threshold of a new technology generation that can be characterized by three major components: new methods of data access (i.e., the Internet); new technology that enables ease of information access (i.e., GIS); and new significant decision support applications (i.e., facility assessment).

Data Access: The Internet

Early in 1997, the author completed a Web-based survey on the use of Computer Aided Facilities Management (CAFM). Of the nearly 300 responses, of which approximately 20 percent were responses from universities, CAFM applications consisted of the following:

Applications such as space and asset management as well as CMMS have been the primary applications for FM

Figure 1: FM Applications

technology for the last ten years. What is new is their enterprise-wide integration, the beginnings (not yet integrated) of powerful new applications such as groupware (the routing of information, virtual meetings rooms, etc.), and technical document management (electronic file management). Major CAFM vendors have not yet developed links between their products and those of the major vendors of groupware (e.g., IBM/Lotus Notes, MS Exchange, and Novell Groupwise) and TDM software (Cyco, Autodesk). Such links are possible but require technical sophistication on the part of the user. Facility managers can look forward to the FM software vendors providing these powerful capabilities in the future.

In terms of the Internet, FM vendors are just beginning to make their data available through Web browsers (e.g., Netscape's Navigator and Microsoft's Explorer). While still somewhat limited in scope (e.g., drawing viewing, entering and querying a work order, reserving a conference room), all major vendors have made major commitments to supporting the Net. By the middle of 1998, it is likely that Internet browsers will be the major CAFM GUI (graphic user interface) for users to enter and query all FM data. This trend will become even more pronounced as the Internet increasingly incorporates proprietary Network Operating System groupware and TDM functionality.

Geographic Information System (GIS) Technology

The collection, analysis, and display of spatial information (GIS technology) is a larger and more mature technology and market than CAFM. For example, ESRI (Redlands, CA), the dominant player in this industry, is probably 50 times as large as the largest CAFM vendor. GIS

Eric Teicholz is president of Graphic Systems, Inc., Cambridge, Massachusetts. The author wishes to thank Ann Godfrey of Vanderweil Facility Advisors for her assistance in editing and case study content.
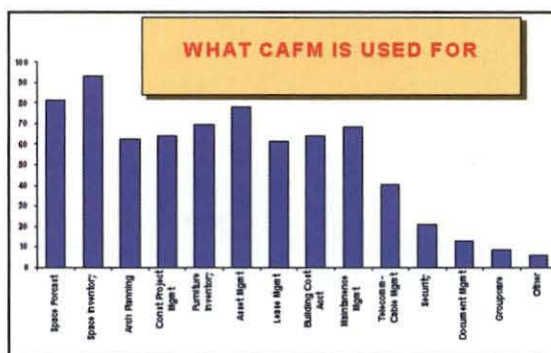
vendors have developed powerful data access and executive information system (EIS) software functionality that isfinding its way into CAFM products.

ESRI's Map Object technology is currently used as a front end to both the ITS SPAN (Warminster, PE) and FIS (Walnut Creek, CA) CAFM products. Like the web's Internet and Intranet technology, the CAFM/GIS integration is still in its infancy but offers great promise—particularly for casual CAFM users to access and report on data, using only a mouse with the GUI. Using ESRI's Map Objects tools, CAFM users can "drill down" into a database to access predefined and ad hoc reports.

For example, a university facility manager might want to locate available (vacant) space within its facilities. The GUI might initially start with a display of the entire campus with buildings identified as "hot spots" on the screen. The user can drill down, maintaining the vacancy query, from the campus to a building to a floor, a room, etc., and then report on that space (e.g., area, ownership, assets, etc.). These queries might be predefined or ad hoc. Additionally, the hot spot might launch an application such as a CAD viewer for redlining and data update purposes. In general, the goal of the GIS system is to offer the user an easy and powerful query and reporting tool without having to spend weeks of training on the CAFM system. GIS frontends to CAFM systems will also be web-enabled within the next six to nine months.
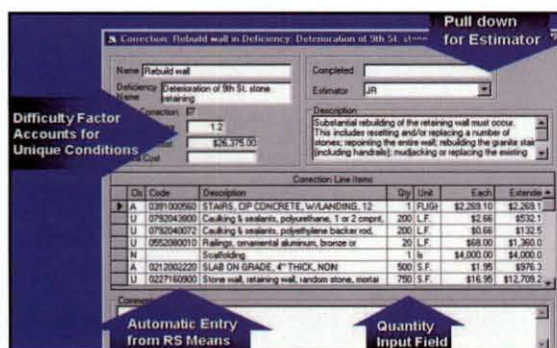

Figure 2: Cost Estimator. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA

Figure 3: Facility Renewal Accrual Curve. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA

Facility Assessment Software as Decision Support

Of the many new applications that are being embraced as CAFM applications, facility assessment software (FAS) holds the most promise for facility management decision-makers. Condition assessment, currently most common in the academic and health care institution arenas, aims to identify and financially model the magnitude of building deferred maintenance backlog. Partly because of the economic recession in the United States during the 1980s, buildings have been seriously neglected from a maintenance perspective over a number of years. Scarce funds have beendirected to nonfacility purposes or allocated to changes in facilities at the expense of ongoing maintenance and repairs. The

consequences of this deferred maintenance backlog are now being felt at many institutions.

For a number of reasons, organizations are finally realizing the severity of the problem and are doing something about it. For one thing, the economic climate is improving and there is more money available for the physical plant department. For another, corporate, as well as institutional *management personnel* need access to a wide range of cost information in order to make long-range strategic planning decisions. When a maintenance situation becomes acute, a facility manager will succeed in gaining a receptive ear in top management.

The first thing management wants is a program that establishes costs and priorities to repair buildings or even, based on both business and economic decisions, to dispose of properties.

Facility assessment software is typically *decision-support* software, meaning it does not automate all facility assessment decisions but rather supports human decision-makers wherever they are, in the office or in the field, at each step of the facilities assessment process. The FAS process can be broken down into these steps: 1) inventory, 2) evaluation 3) reporting, and 4) ongoing facilities management.

Step 1—Facility Inventory

Facility inventory is the first step of the facility assessment process and involves the gathering together of facility data from all relevant sources. A considerable quantity of useful information, including data standards and performance criteria, is derived from meetings held with an organization's facility staff and with those architects, engineers, and representatives of the various trades and consultants involved in facility maintenance and modification. Information is also sourced from the digital alpha-numeric data in computerized maintenance management systems, accounting databases or asset registers, from the digital graphic data in architectural and engineering CAD drawings, and from hard copy documents digitized or scanned into the FAS.

To assist in the inventory process the FAS contains descriptive fields that prompt for data in accordance with predefined standards. Data is ordered into two hierarchies, the first of components, assemblies and building systems,
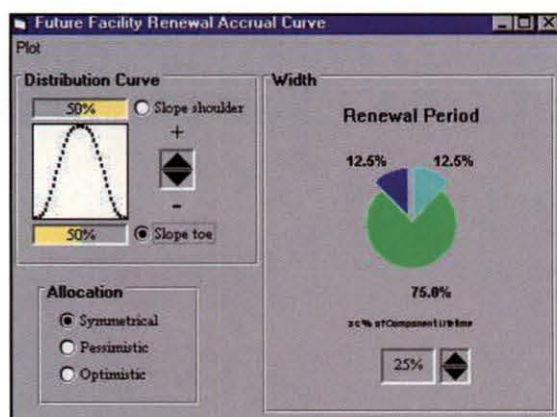
Students petition College officials befuddled by request.
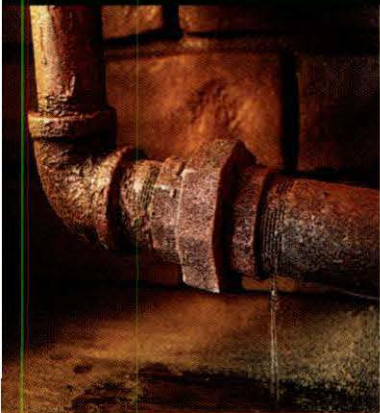
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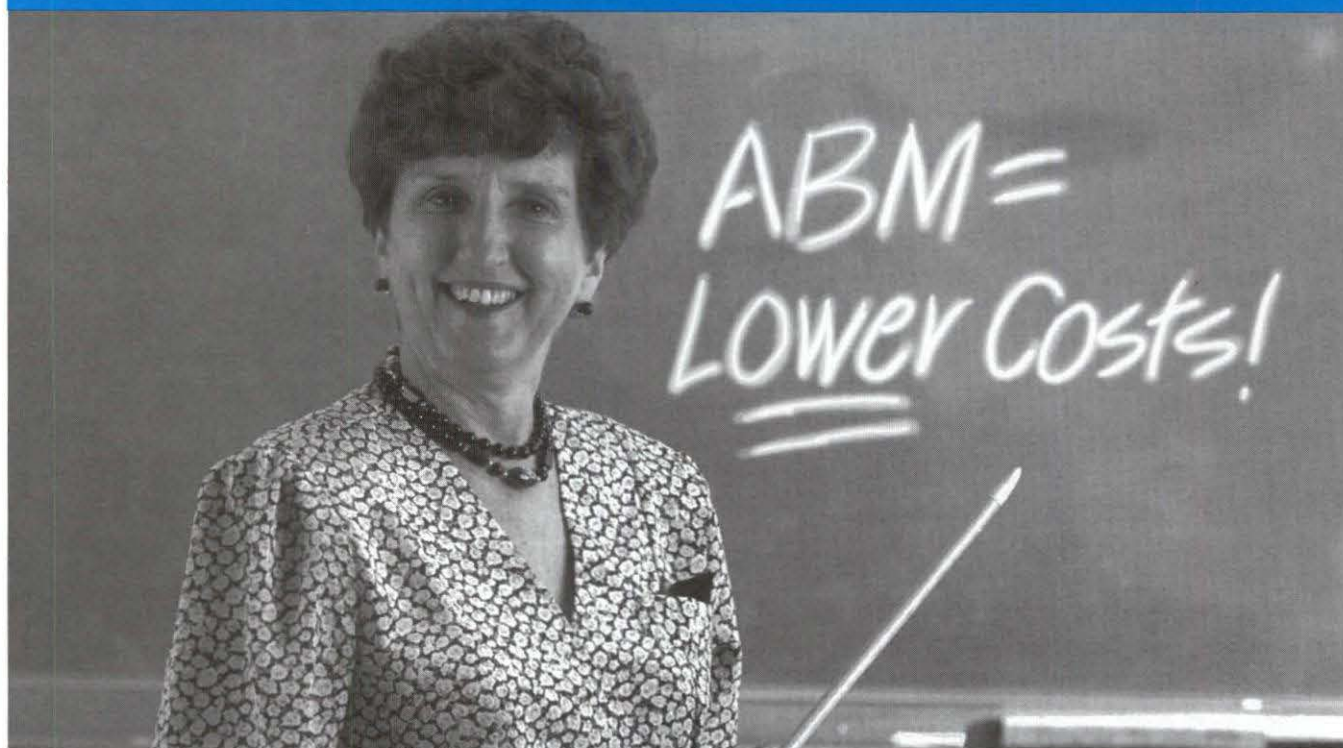
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the second of spaces, rooms, departments, buildings, and campuses. Numbering and classifications are in line with Uniformat and the Construction Specifications Institute (CSI). A cross referencing system links each field to digital photographs and CAD drawings.

As with a CAFM system, there needs to be an automatic link in FAS between CAD drawings and an alpha-numeric database. In most FAS systems, CAD drawings are treated as read only, with all annotations and symbology stored separately from base drawings. This configuration has a number of advantages. Database information can be linked to CAD drawings stored either within, or external to, the system. Base drawings can be rapidly replaced at any time, while read only access for most users prevents unauthorized changes being made to the base data.

Figure 4: Facility Renewal Forecast Over 100 Years. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA

Links to CAFM

The linking of condition assessment systems with CAFM represents a powerful marriage. CAFM systems tend to be CAD-driven — that is, non-graphic information such as fixed or movable assets are usually attached to spatial entities such as rooms or departmental boundaries. Facility assessment Software on the other hand tends to be database-driven and the links to CAD are usually of secondary importance. The ability to link these two systems, using common interfaces such as Windows, offer powerful tools for tracking and reporting on the results of building condition assessments. Specifically, the systems can link in four distinct ways:

• The CAFM system can pass area and CAD information to the FAS database management system, which can subsequently be used for analysis and deficiency location;

• The FAS systems can be queried by the CAFM system and data of interest can be displayed graphically and integrated with other data in the CAFM system;

• Deficiency and other information can be linked to CAFM work order and project management software;

• FAS audits can be, to a certain extent, automated by bar coding, using personal digital assistants (PDAs) and other devices supported by the CAFM system.

Step 2—Facilities Evaluation

A common goal of facilities assessors is the production of maintenance and capital renewal strategies. These strategies require a number of incremental evaluation decisions, all of which are supported by the computational capabilities of the FAS. First, "deficiencies" must be identified and described and located on CAD drawings. Deficiencies are those systems assemblies or components that are unsafe, broken, or obsolete, which do not comply with current codes, or which are approaching or have exceeded their useful life. Evaluation decisions include the classification, prioritization, and estimation of cost to correct each deficiency. The FAS automatically assigns labor and material costs from published R.S. Means cost data, factors in geographic location, construction, and facility type, and schedules the correction over time.

This information alone is sufficient for the facility assessor to develop **recurring and deferred maintenance** strategies. However, **capital renewal**—estimating the cost to

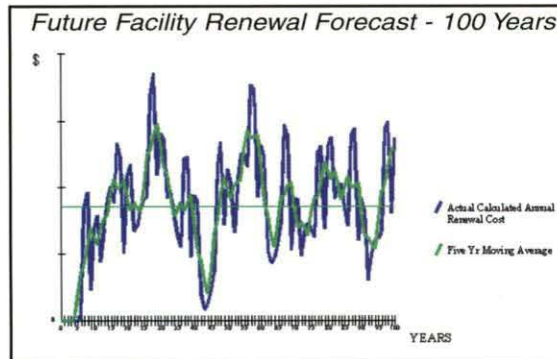completely replace building components, assemblies, building systems, facilities or even an entire campus—requires additional incremental evaluation. The assessor must decide upon the total lifespan of each component, assembly, or system and how far each has progressed through its life cycle. The FAS automatically refers the assessor to life-cycle tables and to the Facility Renewal Accrual curve which enables him or her to try out optimistic and pessimistic scenarios.

Integrated Facility Funding Scenarios

Combining maintenance and capital renewal information produces a number of useful funding scenarios. The FAS automatically calculates a Facility Condition Index (FCI), the cost to correct all deficiencies divided by the current replacement value of the facility. In the integrated funding analysis example shown below, three options were tried out. The first option was to continue with current maintenance strategies, and produce steady growth in FCI. The second option identifies the annual expenditure necessary to achieve FCI equilibrium while the third option was to completely eliminate the backlog of deficiencies within ten years. In the final option the FCI is reduced to zero.

Step 3—Reports

At this point the facility assessment team has completed an up-to-date facility inventory, evaluated performance and condition and run a series of analysis using embedded computational tools. The next step is to use the FAS to support the presentation of results. While hundreds of schedules, flow charts, pie charts, and graphs are standard to the system, customization can produce almost any configuration of contained information. Reports are either hardcopy printouts, digital screen saves within Executive Information Systems presentation software, or ASCII data transmitted to other systems. Both GIS and Internet/Intranet access to this data can be expected from vendors within the coming months.

Step 4—Ongoing Facility Management

Finally, the FAS system is handed over to the in-house facilities team, who with some training and system support take over future facility assessment cycles. The key to future assessment is to ensure that new data is input only once,
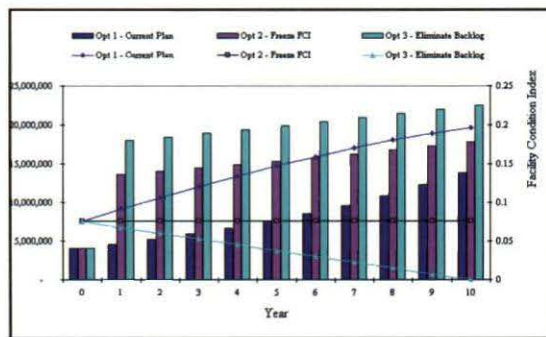

Figure 5: Integrated Facility Funding Scenario. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA
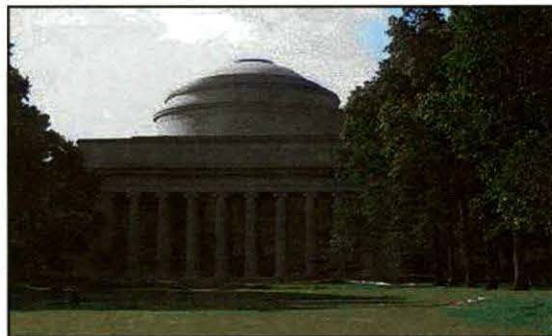

Figure 6: Killian Court, Massachusetts Institute of Technology. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA

and only when necessary. This is made much easier if data standards are issued to all contractors and consultants working on the facilities. When a modification is made, "as-built" data is provided back in the correct format, ready to enter directly into the system.

FAS at MIT

In 1996 the physical plant department at Massachusetts Institute of Technology commenced the sequential assessment of 2.7 million Gross Square Feet of 35 facilities ranging from athletics fields to complex amenities buildings. As computer literate users with extensive CAD documentation, they had a good understanding of information technology and just what it was they required from the FAS. In MIT Physical Plant Engineer Robert Cunkelman's words: "We required a strategic tool which could align facility information with MIT Physical Plant's new organizational structure. Strategic decision-makers in a variety of organizational roles needed to be able to sort and configure current accurate information, for their particular purpose."

MIT's physical plant department has recently been reengineered from a completely centralized organization, with support functions organized by shops, to a hybrid of decentralized zones and a collection of centralized support teams.

In order to become familiar with the assessment procedures and the use of supporting FAS software, a complete facilities assessment was carried on a single building, E34. Culminating in an extensive set of reports, the prototype assessment gave MIT's physical plant staff the opportunity to become familiar with the operation of the FAS and also very clear on exactly which of its functions would be useful. They decided that there was no need for the expense of real-time system integration. CAD drawings would be kept external to the system.

On completion of the prototype, Cunkelman commented that perhaps the greatest strength of the FAS was its flexibility. It delivered accurate information to strategic decision makers when and how they needed it. "We are able to roll up assessment information, such as FCIs, on a zone-by-zone basis or on a facility by facility basis," he says. "We also liked that we have the option to sort by categories other than zone or facilities. The fact that the FAS is based on the

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widely accepted CSI and Uniformat categories is useful when it comes to scheduling and costing our maintenance and capital renewal projects."

Benefits of Facilities Assessment Systems

The benefits of facilities assessment systems are numerous, and have both strategic and tactical implications for both profit and non-profit organizations. At a tactical level, FAS systems support operational decision makers through their calculation of capital implications and costs of various types of deficiencies associated with the physical plant. They can also be used for regulatory documentation and to justify indirect cost recovery requests.

At a strategic level, the systems support decision makers concerned with property portfolio management, long-range facility forecasting of
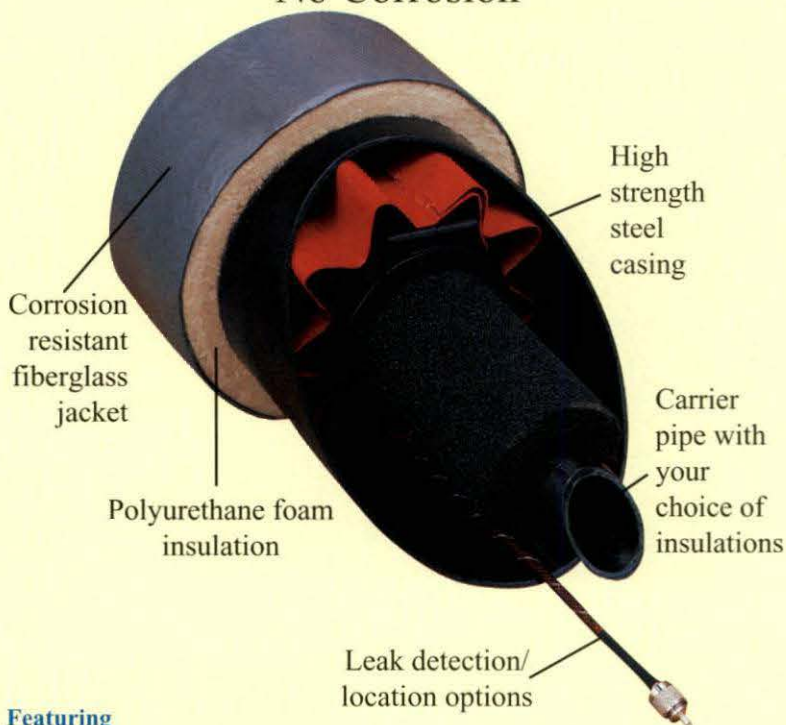

Figure 7: The Strategic and Operational Component of FAS. Illustration courtesy of Vanderweil Facility Advisors, Boston, MA

deferred maintenance costs. Using the cost templates stored in the database, modified for specific conditions, and using various depreciation schedules and replacement costs associated with various systems, an accurate database of information can be created and maintained. In this manner, management can model various investment strategies and predict costs for optimal investment in the physical plant or, conversely, predict the implications of not making an investment in the plant. Management can also look at the potential liabilities of various organizational units, based on their facilities and various types of assets associated with those units. Linked to CAD and CAFM systems, FAS technology provides corporate and institutional organizations a powerful suite of software for collecting, analyzing, and displaying data. ▲

PRODUCT

BASED

MANAGEMENT

by William A. Daigneau

T he question had seemed simple enough. All I had to do was list the products for which I was individually responsible. Yet as I sat in that seminar room on a snowy day in Rochester, New York, staring at my blank piece of paper, I felt nothing but frustration and a growing sense of futility. What was the point of all of this? How would it help me manage the facilities and facilities organization for which I was accountable? Anyway, I was in management. I don't really produce anything. I just manage those that do. Most importantly, we don't produce products, we provide services!

Bill Daigneau is assistant vice president and chief facilities officer at the University of Texas M.D. Anderson Cancer Center, Houston, Texas. He is a cochair of APPA's Leadership Programs.

As I eventually would come to understand, my reaction and inability to answer that simple question was neither uncommon or unusual. The concept that the natural outcome of all human activity is the production of products, even for managers and professionals, is something that we are not conditioned to think about in those terms. Yet that single, fundamental idea reshaped my entire approach to management and how I viewed organization, resource allocation, and performance measurement.

Services or Products?

Like most of us in the facilities management business, I had been brought up through the ranks believing that we were a service organization, providing essential support services to our universities and colleges. The service industry, unlike manufacturing or construction, is different in that we don't deliver tangible products like autos or buildings. This

difference affects how we manage people, processes, and finances, and how we treat our customers. In his book on total quality management, *Building Quality*, Gary Reynolds addresses this problem in his introduction.

It is difficult to relate the service aspects of facilities management with production aspects of manufacturing. Managing a service organization requires a different approach, because the attributes of services are different from those of products. For example, you can count and inventory a product, but there is usually no equivalent process for service delivery. After buying a product you own the product, but after receiving a service you own only a memory....A defective product can be recalled. Poor service delivery cannot, because only the memory of the experience remains. (page 1)

Services by their nature, we are taught, are intangible, variable, perishable, and produce only "memories." Products, however, are tangible, measurable, time specific, and are in the physical world. So, in the practice of managing services, how do we bridge this gulf between services and products? How do we apply management practices that seem to work so reasonably well in the manufacturing business to the service industry?

Well, most of us go out and buy books such as Gary's. We are led to believe that management fads such as TQM, continuous improvement, business process reengineering, customer-focused organizations, team empowerment, or organizational development and training will somehow help us improve our services and our customer's satisfaction.

I used to believe that. Now I say...Bunk!

You see once we fall into the trap of believing we produce services and not products, we are condemned to focus on activities and processes. And once we enter that world, we impose on ourselves a whole host of constraints in how we organize ourselves, measure our performance, and interact with our customers. Most importantly, because we think we must manage the activities and the processes which lead to service delivery, we actually "un-empower" people, destroy teamwork, and in the end, dissatisfy our customers. But if focusing our attention on the management and measurement of activities is so bad, how do we manage services, especially when their end result is unmeasurable and consists of only a "memory."

The solution I think is something I call Product Based Management, or simply, PBM. PBM is not another management fad. It uses no new tools or techniques and does not require you to learn any new concepts, processes, or forms to fill out. It employs only the most time proven ideas and practices, those endorsed or proposed by Drucker, Covey, Senge, and Peters. All it requires is that you readjust your focus, from the world of intangible services to the world of

real, measurable products. Once that readjustment is accomplished, you will be able to use all of the tools and techniques employed by successful businesses, covering all aspects of production management, finance, marketing, and productivity improvement.

What is Product Based Management?

PBM starts from a few simple precepts:
- Every customer has needs........
- Every business has products.......
- Every successful business connects its customers with its products!

Graphically this principle is portrayed in Figure 1.

FUNDAMENTAL LAW OF MARKETS

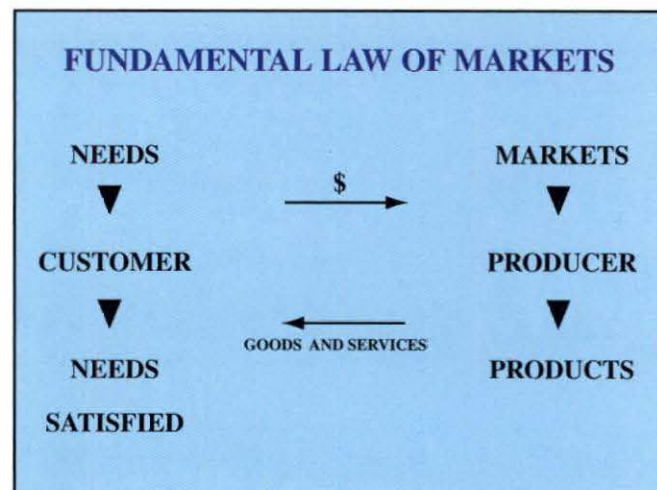| NEEDS | | MARKETS |
▼	$ →	▼
CUSTOMER		PRODUCER
▼	← GOODS AND SERVICES	▼
NEEDS SATISFIED		PRODUCTS

Figure 1

To achieve maximum success a business needs only to understand this simple relationship and to accomplish two objectives:

1. Identify their customers and find out what they need.
2. Effectively and efficiently produce a product that satisfies those needs.

There, that's it!

Now what does this have to do with PBM, you ask? Once this simple concept is understood, you need to apply it to every productive activity—everything from manufacturing to professional services to healthcare to education, even to management. Every activity produces some sort of measurable, tangible product. The trick is to identify and understand what those products are and how they might meet the need of some customer. Once this is understood you are able to clearly derive the goals, the organization, the processes, and the performance measurements necessary to accomplish the two primary objects noted above.

But there is a slight catch. Just as HAL, the computer in the movie *2001: A Space Odyssey*, was unable to deviate from its programming, so too are we human beings sometimes unable to deviate from ours. In the facilities management business, we have been so accustomed to thinking about providing services, we are unable to see

clearly the actual products we are producing and the customer needs that we are trying to satisfy. The power of PBM is that it forces us to look at the tangible outcomes of what we do, and to rethink how we deliver and market those products to our customers.

Application to Facilities Management

In facilities management we have traditionally organized ourselves around the services we provide. We have built entire physical plant organizations around building maintenance, custodial services, motor pools, landscape maintenance, and mail services. But we have found it difficult to sell these services because it is hard to quantify and package them into something our customers can clearly understand and relate to their day-to-day needs. How does one buy a bushel of building maintenance or a box of custodial service? Do you want one or two landscape services? Because of this difficulty we have focused on "levels of service," defining for the customer the frequency and quality dimension of the services we provide. When we are asked the price, we usually quote the number of workhours and an average shop rate, or we explain that it will require so many FTEs with an annual budget of this or that. We've even devised a custodial service for our customers that gives them a choice of buying various levels of cleanliness from "unkempt" to "clean and neat." Imagine Ford Motor Company offering models of their automobiles called "Old Unreliable" and "Looks and Works Great."

So let's take a look at facilities management using PBM. Let's start with one of our customers, an esteemed member of our faculty (we'll call her Prof) and see what she needs. When Prof comes to work in the morning, she goes to her office. She puts her key in the lock and leans against the sticking door to get it open. When she flicks on the light switch, she is happy to see the lights come on. As she walks to her desk, she hopes she won't snag a dustball on her shoe and wants to avoid stepping on a roach. She probably also wants to see her carpet free of stains and lint. As she sits down, she likes her comfortable chair, free of tears and with casters that roll freely. As she looks at the manuscript she has been working on for the past 11 years, she is dismayed to see a drop of water caused by a leak from somewhere above.

Now, as an enterprising business person, what products could I sell her? She probably would go for a vacummed and cleaned carpet, and an occasional pest control inspection or treatment. I think I might sell her door repairs, to unstick that door. I definitely would offer to periodically check and lubricate those chair casters, replacing worn ones when needed. She also might want to buy electric power from me, so those lights and computer keep working. And definitely, I would try to sell her leak repairs, promising to respond within 30 minutes of a call (faster if it is a gusher!).

In this example I have applied the first concept of PBM, identifying my customer and her needs and then designing products to meet those needs. My next step is to establish how I will produce and deliver those products. In the case of the leak, for example, I might decide to have a worker respond to the call, track down the source of the leak, take immediate measures to control it (e.g., install a visqueen barrier), and determine what else, if anything, needs to be done to prevent its reoccurrence (e.g., a roof repair, or unplugging a condensate drain). I definitely would ask the worker to leave Prof a repair service report, noting the time of the repair, what was done, and what additional measures would take place. On that report would be a number for her to call if she had further problems or wished to know the status of the permanent repairs.

My next step is to determine how to market that product and price it. Again in the above example, I might send out a flyer, or put a number in the phone book that said "Leaks repaired, any kind, immediate response 24 hours a day." After I worked up how many of these products I might sell the first year and the labor and materials needed to produce this volume, I might charge a flat rate for the first hour, with subsequent charges pending preparation of an estimate and the customer's approval. At the end of the first year I would analyze my financial performance and make adjustments to my methods for producing the product, or in my selling price.

Finally, to make sure I was competitive, I'd get prices for the same product from other contractors or vendors. If they were providing these services at a lower cost, I'd find out why so I could better adjust my production to provide a competitive price. In this way I would measure my performance and hopefully be able to demonstrate that my product was a good value, worthy of my customer's patronage.

That's how PBM works in principle. In the example about Prof, I would similarly devise products such as Electric Power, Carpet Cleaning, Door and Lock Repairs, all of them organized, produced, and marketed based on satisfying the customer's needs. I'd also periodically meet with my customers. Anytime they indicated a need for something, I'd design a product and see if I could sell it to them—good, solid, measurable products, things people want and are willing to spend money on! Left behind would be any reference to intangible services, such as building maintenance, utility services, custodial (or worse, "housekeeping"), and something lovingly called Physical Plant, or simply "Plant."

Experience with PBM

At the University of Texas M.D. Anderson Cancer Center, our application of the principles of PBM have been both interesting and startling. Interesting because we have learned a great deal about ourselves and our customers. Startling be-

cause not only have we achieved outstanding results, but the incorporation of this concept permeates everything we do and say in our management.

Our experiment with PBM began about three years ago when we decided to reexamine our entire organization while considering some pretty aggressive cost reduction goals facing our healthcare operations. We initially formed a group called the Facilities Management Design Group which consisted of all the primary managers of the then existing organizational units. The group met weekly for over six months. Every meeting consisted of a review of what had been accomplished during the previous week, an agenda of what needed to be accomplished during the current meeting, and a homework assignment for the coming week. The process we followed consisted of four key steps: 1) Identify our products; 2) Identify the customers for those products; 3) Develop an organizational structure which would facilitate the production and delivery of those products, and; 4) Restaff the new organization, restructure our accounting and budgeting systems, and develop product performance measures.

Product Identification. The first step was the most difficult. We began by first defining the concept of product and then attempted to list every product we were producing at that time. Repeatedly we discussed and refined the lists to eradicate any semblance of activities or services. I remember one such discussion well. Our environmental health and safety manager had listed "Fire Safety" as one of his unit's products. When challenged to describe the tangible, measurable characteristics of this product, he proceeded to describe all of the activities his inspectors perform in delivering fire safety. When further challenged to describe the actual product of all this, he meekly suggested "an unburned building." While his answer represented the final desirable outcome of his efforts, it nonetheless would be difficult to package and sell this to our customers as a product. Further discussion finally yielded a more practical and tangible description of a fire safety product, a fire inspection report. This was something that could be defined in the physical world, was measurable, and could be costed for its production. Such discussions were repeated over and over again as we attempted to develop a comprehensive list of our products. The difficulty we encountered in completing this seemingly simple and straightforward task reveals the power of our conventional thinking regarding delivering services versus producing products. After several months, we finally completed this first step and turned our attention to our customers.

Customer Identification. For each product, our next challenge was to identify who within our institution would be interested in buying such a product. Again what seemed simple took some time to accomplish. We found that we wanted to use general descriptions of our customers such as "staff" or "nurses." To help focus our thinking, we began to use the names of actual people. This led us finally to create three groups of customers based on where their names fell within the organizational hierarchy of M.D. Anderson. These groups were identified as Corporate customers, Mission customers, and Unit level customers. Corporate level customers were the president and his executive staff. They were concerned primarily with the overall direction and survival of the institution. Mission level customers were those in charge of one of four main missions of the institution: patient care, research, education and prevention. Unit level customers were those that belonged to any one of a host of departments that relied on and used facilities at Anderson. Such departments included pediatrics, surgery, business office, and, yes, even other facilities departments. Every product was grouped under one of these three customer categories. We were now poised to develop a organizational scheme that would foster production and delivery of these products to our customers.

Organization. The grouping of our products led to an interesting discovery—our products could also be grouped into one of three categories: asset management; property management; and various logistical operations required to support the campus such as mail delivery, energy production, or transportation. Fire safety inspections, for example, were grouped under asset management, whose primary customer was the corporate level. Our reasoning was that a unit level administrator did not particularly welcome a fire inspection report that listed a bunch of things the department had to correct. The real customer of such inspections was the president who is concerned with protecting the institution's assets, both human and capital. These considerations led us to the development of the overall organizational concept shown in Figure 2.

As we developed the organization we further refined the Property Management core products to align them even more closely with their customer groups. This led to creation of three property management groups: one organized around patient care, another around research and education, and a third for general administrative and support functions. Our final organizational scheme created five departments responsible for production of products for our three main customer groups. We also created a sixth department providing a backbone of financial, personnel, information technology, and quality improvement products for the other five operating units. The final design of the actual organization is shown in Figure 3.

Restructuring

With the final organizational design in place, we turned our attention to implementing the new production structure. The original Facilities Management Design Group was dismantled and six implementation teams were formed, one for each new organizational unit. These teams were staffed

MDACC
FACILITIES MANAGEMENT

Corporate Level — Capital Asset Management

Mission Level — Property Management
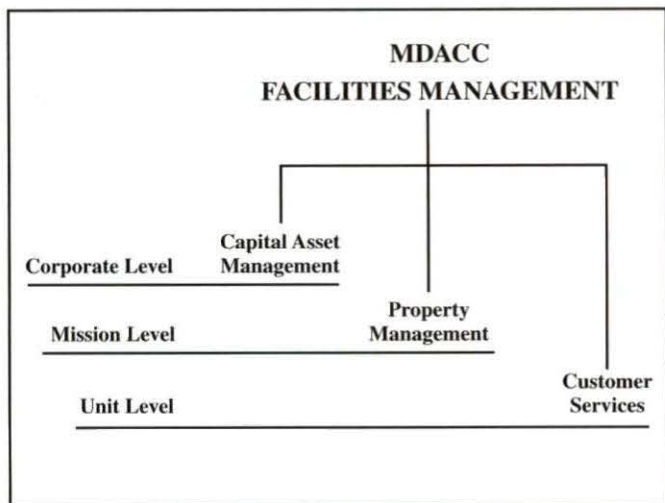
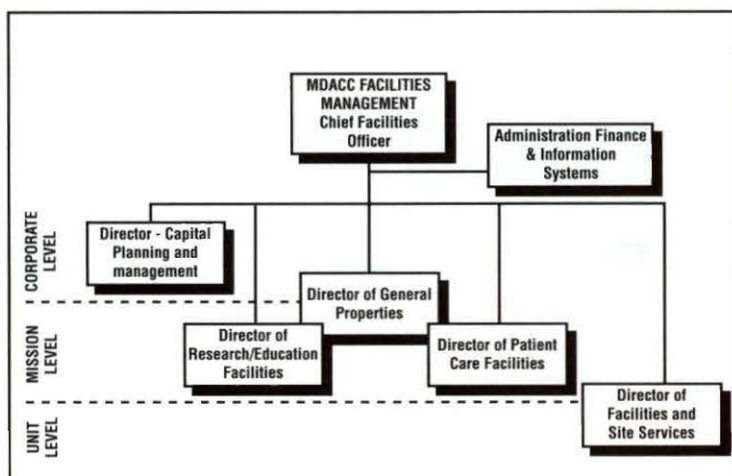Unit Level — Customer Services

Figure 2

Figure 3

from members of the original design group plus people from other administrative departments such as institutional planning, the business office, and "customer" departments. The latter group provided us with valuable insight on actual production and marketing of our products.

The teams met for two months developing details on staffing, budgets, and processes for the new units. At the same time, I began recruiting the six new directors to lead the organization. Once the implementation teams completed the staffing requirements and developed appropriate job descriptions, we conducted a "draft," allowing current employees to indicate their first, second, and third preference positions for placement. Of some 280 employees affected by the restructuring, we were able to place 50 percent in their first choice position, and over 80 percent in their first or second preference. On September 1, 1995, the beginning of our new fiscal year, we shifted all 550 employees and vendors from the old structure to the new. This was accomplished without any disruption to the Cancer Center's operation, truly a tribute to the hard work and dedication of many people.

What Has Been Learned?

We are completing our second year of the new structure designed using PBM. We have completely overhauled our chart of accounts to establish financial data for performance measurement of each production unit. In this fiscal year we will launch a system of benchmarks to measure ongoing productivity and effectiveness, all geared to our specific products.

What do our customers think? We surveyed them to find out, and were quite pleased by what they had to say. On a scale of one to five with five being excellent, our customers rated us at least a four on almost every dimension of quality and responsiveness despite the fact that we have reduced our operating budget by 25 percent in the past three years.

And what do our employees think? We surveyed them, too. Over 90 percent said they knew what was expected of them and their role in the new organization. We also asked what motivated them the most. They told us that two of the most powerful motivators (and ones that cost no money) are a word of encouragement or recognition for a job well done from either their supervisor or a customer.

Overall we are quite pleased with the results of our experiment in PBM. Of course PBM, in itself, is not a replacement for good and effective management, but it does help clarify for you, your employees, and your customers the very tangible things you produce. And, in doing that, you are then able to apply the most basic and sound management techniques to improve production, customer relations, and financial performance.

We continue to refine our products, our organization, our employees skills, and our measurement tools. All are aimed at achieving our vision: Faster, Better, and Less Costly than anybody else. ♟
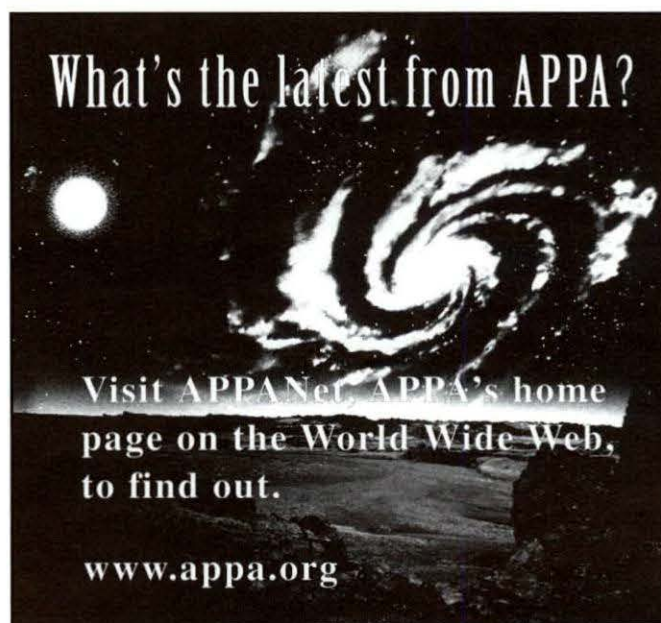
The Western Governors University

A NEW LEARNING SYSTEM FOR THE 21ST CENTURY

by Robert Albrecht, Ph.D.

The vision of the Western Governors University is decisively shaped by the Information Age. The growing availability and capabilities of advanced information technologies make it possible to deliver instruction from anywhere, to anywhere, at any time. The barriers of time and place are eroding; opportunities to learn are everywhere. At the same time, this broad access to knowledge and other sweeping transformations brought about by the Digital Age have created new challenges for educators, students, employees, and employers.

States are seeking innovative and cost-effective ways to educate and train a diverse and ever-growing populace. Higher education institutions must be able to respond rapidly to the ever-changing needs of students and employers. Employees, striving to further their careers or improve their skills, desire more flexible and convenient ways to get the education or training they need. Employers, who must constantly train and retrain employees to stay competitive, are always searching for efficient, cost-effective ways to get the job done. And all of these people and entities would

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Robert Albrecht is chief academic officer for the Western Governors University. Utah Governor Mike Leavitt spoke on WGU at APPA's 1996 Educational Conference in Salt Lake City.

welcome a mechanism that formally recognizes learning based on the acquisition of competencies, no matter where it takes place.

Much of our country's and states' economic success or failure in the twenty-first century will be the direct result of how well we address these educational challenges. The Western Governors University can play several important roles. It will:

• Offer competency-based degrees and workplace certification. Brand-name education is becoming less relevant in an information-driven society, and the WGU will provide individuals with new opportunities to make their learning portable in the marketplaces of employment and academe.

• Harness technology to the fullest to expand educational opportunities, reaching a wider array of students and offering courses from a wider array of sources. Unlike other distance learning efforts, the WGU will bring together and act as a broker for both traditional and nontraditional educational providers, from universities to corporations that train employees for specific skills.

• Work with regional accrediting commissions in developing accrediting standards and policies for the WGU. Four regional accrediting commissions that operate in the Western region have agreed to create a joint body called the Inter-Regional Accrediting Committee to review the accreditation of the WGU.

• Foster interstate and public-private cooperation in the development of new instructional materials that respond to unmet needs in the region. The WGU will work with the business community in developing proprietary and non-proprietary instruction material that will be used in awarding competency-based workplace certifications.

• Provide "just-in-time" learning for employees. For example, computer language changes quickly, and programmers require frequent training to master the new language. With swelling enrollments on the horizon, WGU will address the states' collective need to continue providing high quality educational services, ensuring their citizens have the skills they need to remain competitive in the nation and the world. WGU will accomplish these goals in ways that complement instruction offered by existing colleges and universities.

How Will It All Work?

The WGU has three critical components: an Internet-based smart catalog/adviser, local/regional centers, and a central operation.

The Nerve Center

The smart catalog/adviser has been called WGU's nerve center, because it will be the place a student turns for all of the WGU's varied services. While the Catalog/Advisor will list various courses and programs offered by traditional and nontraditional education providers, it will be much more than a course list. Most important, it will map the skills a student needs to master in order to receive a WGU credential. Students will be able to use the system to assess their existing skills and knowledge to help determine what additional competencies are needed.

Utah Governor Mike Leavitt, left, and Colorado Governor Roy Romer, center, cofounded WGU.

Students will also use the Catalog/Advisor to create a profile, including convenient times for taking courses and the types of technologies preferred, e.g., the Internet, computer software, videotapes, or satellite. The software system will use the profile to identify learning options for students leading to certificates of competency, professional certification programs, academic degrees or individual courses. The Catalog/Advisor will also provide the cost of each course, job and career information and guidance and assessment services. All this will allow students to do comparison shopping.

The Catalog/Advisor will simplify the enrollment process. Information included in a student profile will only need to be entered once, even if a student is taking courses from more than one education provider. Tuition will be paid to the WGU, which will make distributions to the providers.

Once a student acquires the skills required for a WGU certificate of competence, an assessment will be conducted by a third party under contract to the WGU. If that assessment requires a student to travel to a campus or other location for an intense evaluation period, the Catalog/Advisor will be used to locate a center and schedule an assessment based on preferences listed in the student's profile. Upon successful completion of all the required assessments, a WGU credential will be awarded.

Following extensive negotiations, IBM was selected to construct a pilot and initial version of this unique, online Catalog/Advisor by late fall of 1997. Focus groups from pilot education providers will test the system prior to its official debut in early 1998. IBM produced an earlier prototype of the WGU Catalog/Advisor to demonstrate how it might work. Since that time, WGU officials and contractors have been developing specifications for the various functions the Catalog/Advisor will perform. IBM will develop the software for the advisor's core functions, but contracts for other business-related software have not yet been awarded.

Local/Regional Centers

Each of WGU's participating states must establish at least one center that will provide one-stop shopping for WGU services, including access to the delivering technologies. These local/regional centers will be affiliated with the WGU to provide many support services and to serve as a point of access for students. While some centers may be newly created organizations, it is anticipated that most will be existing organizations such as public libraries, county extension offices, high schools or postsecondary institutions, companies training their workforce through the WGU, or local businesses that see supporting WGU students as a business opportunity.

Among the services the centers will offer:

• Conduct pre-admission, interim, and final assessments of specific competencies.

• Provide individual counseling and advising, as well as assistance in accessing centralized services (such as the smart catalog and online counseling and advising services).

• Provide access to information on learning resources, requirements for certification and credentialing and assessment resources.

• Provide access to information technology and services, including computers, audio and video classrooms and Internet connections.

• Identify unmet education and training needs in the local or regional area and provide the WGU with information on needs assessment and market analysis.

The Central Operation

Originally housed at the Western Governors' Association, the WGU became an independent, nonprofit corporation in January 1997. The corporate and administrative headquarters are located in Salt Lake City and academic development functions are headquartered in Aurora, Colorado. The two central operations will be responsible for governance and policy, for creating and maintaining its key assets (the catalog, management systems, etc.) and for quality control. More specifically, the central WGU will:

• Serve as the gatekeeper and supervise the performance of entries in the WGU virtual catalog.

• Provide quality assurance in the selection and adoption of assessment tools.

• Compile needs assessments and market analysis information, and determine needs and priorities of individual learners and prospective and current employers.

• Establish priorities and coordinate the process for the cooperative development, acquisition and utilization of assessment tools, courseware, and learning modules.

• Establish criteria for and enter into agreements with other organizations and entities for the operation of local and regional WGU centers.

• Develop training, monitoring, and auditing procedures to ensure high quality and proper operation of local and regional WGU centers.

• Provide centralized services including financial management and the maintenance of academic records regarding certification of competencies and program completion.

• Develop standards and implementation strategies for the provision of student services, including financial assistance, library/information services access and utilization, technical support, counseling and advising.

• Establish requirements for degrees, certificates and other credentials offered by or through the WGU in collaboration with subject area specialists and provide mechanisms to assure maintenance of academic quality and integrity both in learning and assessment. WGU will validate and coordinate the assessment processes leading to the awarding of a degree.

• Assure compliance with regulatory and accreditation standards.

Adding a New Dimension to Higher Education

The name, Western Governors University, is in itself indicative of the unprecedented commitment made by 16 Western U.S. governors to create an entity that will address in entirely new ways a very real set of higher education needs for the twenty-first century. By pooling the resources of participating states, WGU will add a new dimension to the delivery, quality, accessibility, and affordability of higher education. It will do so, not as a public institution, but as a private, nonprofit university, with its economics driven by the marketplace. And WGU will bring together the resources of the private sector in ways that will open new opportunities for all institutions to create partnerships.

The WGU will not and is not meant to replace traditional institutions, rather it will expand access to their resources and generate additional revenues for them. The WGU will open worldwide distribution channels for educational services because all WGU content will come from institutions of higher education—public and private—in addition to nontraditional providers. By drawing upon the faculty resources of existing institutions, the WGU will make the best use of existing resources, avoiding duplication and resulting in the wider dissemination of course content from colleges and universities. The growth of the distance learning market and an expected increase in the number of students to be served will require the continued heavy use of traditional campuses. Far from replacing the campuses, WGU will encourage those campuses to deliver course content more widely than ever before; many institutions will serve more students both on and off the campus.

Furthermore, WGU will draw upon the traditional institutions for course content. WGU will assess students for competencies acquired, but the teaching of those competencies will typically fall to the campuses with high quality distance learning programs. While the WGU may reduce the need for facilities to meet expanding student populations, it will increase the demand for the delivery of education from traditional campuses.

The advantage WGU offers smaller institutions is that it will enable them to broker a more complete array of programs for their students. They'll be able to import specialized programs from other institutions and thereby better serve their communities.

States will also realize an array of benefits. At the top of the list, the WGU will refocus attention on the critical issues of quality and competence in education. It will substantially improve access to educational services for the states' individual and corporate citizens. And it will encourage states to concentrate their resources, providing economies of scale, as they strive to meet the educational demands brought on by

changing demographics and job markets. Jointly funded courseware development and a coordinated marketing plan will also provide savings. The WGU should not be expected to, nor indeed should it, reduce state support for higher education; rather, the funds expended will be more efficiently used, enabling the states to continue to provide the necessary levels of ongoing support for their existing institutions instead of having to siphon away funds for more and more campuses.

The Road Map to Success

The Monitor Company, a nationally recognized management consulting firm, is developing a business plan that will show how the vision of WGU—providing competency-based credentials and increasing access to higher education—can be achieved in the most cost-effective fashion. It will also provide a road map for launching the WGU, sequencing the introduction of product and services to make the enterprise as economically self-sustaining as possible.

Using a conservative set of assumptions, Monitor's preliminary findings indicate the WGU will need an estimated $25 million in funding during its first eight to nine years of operation. The WGU should begin to realize significant student volumes by 2002, particularly in the customized corporate training market, and is expected to be self-supporting in 2005.

The low-funding requirement is largely due to WGU's planned emphasis on outsourcing instruction and student services to established providers, thereby minimizing the fixed investment needed to establish the entity. The WGU's early financial needs can be met through corporate, foundation, and other non-state government sources.

We think that the WGU will become a major force in the distance learning market and in the market for higher education in general by designing and administering competency-based certifications and degrees, brokering courses as an Open College for educational providers, and acting as a clearinghouse to promote programs of educational providers on its online catalog system.

Both students and providers are increasingly accepting the merits of distance education, yielding the present as an optimal time in which to translate a novel distance learning concept into a functioning entity with widespread customer appeal. ▲

HIGHER·EDUCATION

AND THE NEW MEDIA AGE

by Ervin S. Duggan

In my mind, there exists a triple crisis in American life. The first aspect of the triple crisis is a crisis in education. We feel a genuine sense of crisis as we struggle to provide access to students who once were left out, and we feel a sense of crisis as we work to maintain quality even as we broaden access.

The second aspect is a crisis in our popular culture. Ours is increasingly a vulgarized and coarsened popular culture today, flirting with violence at a level that would have been unimaginable in previous generations. Our coarsened popular culture is a crisis for parents and also for educators who see its effects in the classroom—in a lessened receptivity to learning, a lessened respect for authority, and a lessened respect for distinction and greatness. The third aspect of the

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triple crisis is a crisis of citizenship. Has there ever been a time when leaders were more prone to mount the partisan barricades in animosity and anger? When gridlock was the normal condition of public life and policy? A deepening cynicism about leadership and government—a crisis of citizenship—is the product of today's partisan anger and conflict. Fortunately, you and I represent institutions that can constructively address every single aspect of this triple crisis. At PBS, we identify our mission as education, culture, and citizenship; we set out to use satellites, television, video, and computer technology to enhance education, to disseminate the best of culture, and to create an island of civil discourse in the storm of political contention. On your campuses, as well, you take up the same mission. And so together we are blessed and challenged to represent institutions that hold out hope.

The Hopeful Possibilities

When it comes to hopeful possibilities, let me start with an example from the enterprise I serve. We have at PBS a whole aspect of our mission that is not seen on the prime-time screen: adult video courseware. Every year, our PBS Adult Learning Service beams distance-learning telecourses

by satellite to two-thirds of the colleges and universities in the United States—video courses that become valuable and vivid tools in the hands of talented professors. This year, roughly 400,000 adult degree candidates will participate in those courses: a marvelous use of technology on a scale unimaginable 30 years ago.

A particular project of our Adult Learning Service is one we call "Going the Distance," through which we enable 130 community colleges in 37 states to deliver the associate of arts degree totally through video telecourses. A teacher, of course, is always in charge—but through the combination of video courseware and the interactive feedback loop offered by the computer, students can now receive their A.A. degree in a number of disciplines. Busy people with families and jobs—people who a few years ago might never have imagined continuing their education and becoming credentialed—now are able to advance their lives and careers through this and similar programs.

Until recently, video telecourses were plagued with certain imperfections, by a kind of top-down, non-interactive quality, for example. But a breakthrough is now occurring in technology that will help us cure those imperfections as formerly separate technologies converge, as the telephone, the computer, and television become seamlessly merged. We can see it happening now, in a rudimentary way, with the Internet. In years to come, convergence will be complete, we will see a higher degree of interactivity, and we will see the emergence of servers that make it possible to store courseware and enable "learning on demand."

At PBS we are working right now to renew and enlarge a service called the Business Channel. We plan to use satellites, fiber, video technology, and digital "library servers" to deliver business education, financial information, and professional training on demand to the desktop computer. We hope that the Business Channel will become a vital force in American business life, exploiting the converged technologies of telephony, the computer, and video.

These are only a couple of the hopeful possibilities before us. But what marvelous possibilities! And how fortunate we will be if you, in all of your disciplines and all of your institutions, help us to think about how we can apply these technologies to resolve the crisis of education: to extend access and maintain and enhance quality.

Clear Heads and Clear Principles

Let me turn now to my more sobering second topic: our need for clear heads and clear principles. All too often we approach the issue of technology in education with precisely the opposite. Indeed, it is my judgment that a large obstacle stands in the way of fulfillment for our dreams of effectively using technology in education. That obstacle, paradoxically, is our own excessive enthusiasm. At my house we have a little dachshund named Max. Now, Max's sheer enthusiasm

to go for a walk often interferes with our efforts to attach the leash to his collar and get him outside. He delays the walk—precisely because he is so wildly eager to take the walk. In much the same way, our own naive, utopian, romantic enthusiasm—our gee-whiz, uncritical love for gadgetry—is likely to be a handicap when what is needed is a much cooler and more realistic approach to this subject.

Indeed, it may be that among the many besetting sins of Americans is what we might call "techno-utopianism." The New York World's Fair of 1939, for example, was a kind of fiesta of techno-utopianism. It predicted all sorts of gadgets that would revolutionize the quality and convenience of American life, from Hovercraft that would deliver us to work to Buckminster Fuller's great Dymaxion house: a mushroom-shaped affair in which all utilities were fed up through the permanent stem of the mushroom to the removable pod on top. Fuller's idea was that we would take our pods with us when we moved; the state would build the central stems—the masts for the utilities—and cranes would simply lift our pods atop them, wherever we wanted to live.

A good many other technological dreams were put before bedazzled visitors at the 1939 World's Fair, most of which seem wacky now. Of the relatively few that came to reality, one was something called television. It has had enormous impact—an impact far short of utopian. But most of the techno-utopian dreams of 1939 were not fulfilled.

For many years, another techno-utopian gadget has been pushed by the telephone companies as the wave of the future: the videophone. Again and again, consumers have rejected the videophone. So far, they have been uninterested in paying a steep price for a phone that would enable them to see Grandma in curlers, or a business associate cringing at the proposal he's hearing. Yet the dream persists, and the telephone companies insist on bringing the idea back, slightly revised, again and again.

Now, it may be that when convergence is perfected such a device will truly emerge as the next big thing and will succeed in the marketplace. While we wait for that consummation, however, it may be a good idea to adumbrate some clear-eyed guiding principles; unless we do, we may suffer from so many illusions that inevitably we'll be disillusioned. Let me suggest three such principles.

• The first principle is that *content is more important than gadgetry*. I will confess that I roll my eyes every time I hear our president and vice president cheerleading for something called "wiring the schools." Wires are fine. Waves and fibers and gadgets are fine too. More important than any wire, wave, fiber, or gadget, however, is content. What, for heaven's sake, will travel over the wires when we "wire the schools"? That is the question.

• A second important principle is that *the teacher or mentor is central to the process of education*—even when technology is introduced into the classroom. In the early

days of "educational television," the naive dream was of supplanting the teacher and even the classroom. The early dreamers dreamed of students actually being taught by television set! The expenses of schools and teachers could be slashed, those dreamers imagined, by disconnecting teachers and learners. Those dreamers dreamed the wrong thing. We need to dream dreams in which technology is a useful tool, but in which we honor the traditional leadership of the teacher, who has always been central to the success of education. To dream of technology as anything other than a tool in the hands of talented teachers and mentors, in my judgment, is to suggest a dream unfulfilled, or even a nightmare.

• A third principle: We must remember that *every technology implies certain habits of mind.* Thinkers like Marshall McLuhan and Neil Postman, for example, have pointed out that the book implies habits of mind that are linear, sequential, coherent, rational, and logical. Television, used in the wrong way, encourages precisely the opposite habits of mind: its fragmentary, episodic, quick-cutting ways, with images moving quickly and then disappearing, implies thinking of the same sort. Documentary filmmaker Ken Burns uses television in a way that oddly evokes the experience of reading. He slows down the pace and uses images and words in a way that is linear, coherent, and rational. Our new uses of technology in education must be careful—as Ken Burns is careful—or we may encourage habits of mind that we should not wish to encourage.

Three principles to remember, then, to keep in mind as a way of avoiding a techno-utopian romanticism that could lead us to embrace technology and gadgets for their own sakes, or for the wrong reasons, or in the wrong ways.

What We Must Do

What can we do, and what must we do, if we want the marvels of the new media age to be used for "education, culture, and citizenship," and not just to create a glittering electronic arcade for entertainment and commerce?

The first practical task I would suggest is that we become advocates—passionate and effective advocates—in the arena of public policy for the intelligent and constructive uses of technology; for adequate public resources for the constructive, educational use of technology. Now, you are no strangers to the resource constraints and the political starvation of education, especially higher education, that are occurring in many places across our country. They are part of the educational aspect of the triple crisis.

You may be familiar with today's temptation to relegate education to too low a place in the hierarchy of our national ambitions. But however familiar it may be, it is something new and dangerous. A different ethos guided our country in previous epochs.

The eighteenth century, for example, gave the world Thomas Jefferson's concept of free public education: the concept of setting aside public resources for the general education of all. Some of Jefferson's political contemporaries accused him of hatching an idea that would "bankrupt the commonwealth." But Jefferson succeeded, late in his life, at creating the University of Virginia; he succeeded in implanting the idea of setting aside public resources for the free education of all citizens. His idea, in action, has not bankrupted the commonwealth; it has enriched it.

In the nineteenth century, that same concept—the idea of generously setting aside public resources for general education—was exemplified in the Morrill Land-Grant College Act, still a glory of American education. Morrill and Lincoln set aside public lands in every state for colleges and institutions of practical, agricultural, and mechanical arts, and the country is richer for that vision.

In the twentieth century, we can see the same ethic, the same idea, at work in the set-aside by the Federal Communications Commission of roughly one-third of all electromagnetic spectrum—radio and television spectrum—for noncommercial, educational use.

Where is that ethic, that idea, that vision today, as we stand ready to enter the twenty-first century? Do we see a corresponding zeal to set aside a portion of cyberspace for humane, civilizing, educative use? I am sorry to say that I do not see such vision, such social imagination, at work among our leaders today. I see no Jefferson, no Morrill, no enlightened FCC or Congress, as we enter the twenty-first century, advocating that we do what was done in those earlier centuries: Guarantee a set-aside for education, guarantee future lanes for public culture and enlightenment on the information superhighway.

We are experiencing, instead, a lamentable break with our heritage and history. And as a result, we are in danger not simply of "dumbing down" our public and cultural life; no, we face the greater danger of a political dark age, in which the very leaders who should encourage the highest aspirations instead advocate the opposite: the dispossessing of public education.

A set-aside of public resources for technology in education is a prerequisite if we are to make progress in the general uplift of society: the resolution of the triple crisis. Without that reservation of public resources, we will see technology used imaginatively for commercial applications in business and for trivial entertainment—with the more noble uses of technology denied to all but the richest among us. So we have a job to do as advocates in the marketplace of public policy. We need to encourage a higher degree of social imagination on the part of our leaders.

If our advocacy is to be effective, we must communicate a vision of our own. And so a second practical task for us is to find those applications of educational technology that work well and encourage their spread. If the Business Channel

works well, for example, then we may be able to imagine its corollary in the world of higher education—courseware stored in the server and delivered, on demand, to the classroom or the individual desktop. I can imagine a grand expansion of the PBS Adult Learning Service—perhaps, some day, to every home. If we craft the vision, we will have a better chance to find the money, the editorial intelligence to craft the needed content, all that we need to create a great new "university of the air."

Before I turn to the final task that I would lay before you, let me ask you to participate in a little exercise of the imagination. Imagine, if you will, a new device that could help us work a kind of technological magic in education. What would such a device need to be?

First of all, it would have to be considerably smaller and lighter than even the laptop computers of today. It would have to be very low, moreover, in its power requirements—for even the laptop today is slave to the battery and the wire and the AC adapter. Imagine, instead, a device with such low power requirements that just a beam of light, solar or electrical, would be enough to make it work.

Imagine a device, indeed, that would never run out of power, even after days, weeks, or years of use. The device we need would have large storage capacity; it would be capable of storing hundreds of thousands, even millions of bits of information. It would be so simple that adults could use it, but so could young children. It would be almost magically portable: portable enough to use in bed, at the beach—even in the bathtub, if one wanted. And finally, it would be so affordable that almost anyone could buy it, and so easy to mass produce that millions would be available.

Imagine such a device springing suddenly onto the scene. Well, such a device already exists. It is called a book. It is a marvelous work of learning technology: lightweight, cheap, and elegantly simple to use. I hope it finds a central place in the classrooms of the future.

The Final Task

Which brings me to the final task that I would suggest to educators in the new media age. You need to give the people in your charge some relief from the distractions of that age. We live washed, almost drowned, in a Niagara of new media noise that threatens to overwhelm us: a Niagara of mere data, of unassimilated information. There's a wonderful line in Pascal's

Pensées in which he observes that "most of the ills of the world can be attributed to the inability of men to sit quietly in their rooms." A fundamental task of higher education in the new media age may be to encourage people to sit quietly in their rooms—absorbing, from both old technologies and new, what is essential; screening out the inessential, the chaff, that threatens to bury us in the new media age. Your great opportunity is to help them find, in the welter of mere data—mere information—that increasingly rare and increasingly valuable thing called wisdom.

There you have it: a kind of mixed-media picture about education in the new media age. As you can see, I am both a friend of technology, excited by its possibilities—and something of a skeptic about our ability to use it wisely. In the end, I would describe myself as a willed optimist, but by no means a utopian or a romantic. Ben Wattenberg ends one of his books with a lovely observation that I never tire of contemplating. In American history, he says, it is the optimists who have always turned out to be the true realists. I hope we can say the same thing about ourselves, years from now, at the end of the task that awaits us in education and technology. ♟

Will Responsibility Centered Management Affect Facility Renewal?

by Matthew C. Adams, P.E.

While business

trends and management theory fads move through the ranks of corporate America at an increasing rate, the halls of our education system often remain unfettered. The guarded approach to management rethinking in education serves as both a benefit and bane. Many on the outside view our educational institutions as too conservative and risk-adverse. However, the nature of nonprofit institutions demands security, predictability, and consistency. When a new trend begins to gain solid recognition in the education world, there must be some real substance or attraction associated with it.

For the past few years an increasing "club" of institutions have embraced a new system of financial and resource management that has an acute effect on facilities management. This new institutional resource management system was originally labeled ETOB or "Every Tub On Its Own Bottom." The original high profile institution that embraced this system was Boston's own Harvard University. Since then, other institutions like Cal Tech, University of Illinois at Urbana-Champaign, University of Michigan, University of Virginia, and Indiana University have implemented this system. It is now commonly called RCM, or Responsibility or Resource Centered Management. While the opinions regarding this system are mixed, it is certain that the ramifica-

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tions in facilities management are a real force to be considered.

In the simplest sense, RCM is the system that moves the decision authority for many if not most of an institution's resources and cash flow down to the dean and director level. It is generally recognized that the provost is overloaded and underinformed to make the most accurate spending and management decisions on a day-to-day basis for each college or school within the university. The operative theory is that each dean can make more effective and economical resource decisions regarding his or her department. The space occupied by the college is no longer free. The dean's role expands to include most of the business aspects of running the

department. In order to run the college, the dean is given his or her calculated share of the general fund budget on a formula basis. As such, the facility maintenance and management decisions are now made at the individual college level. The supply end of this financial system requires that the service providers, like the facilities department, must sell service to the various colleges and departments. Many facility departments now charge or sell services to the auxiliary departments such as residence life. Under this plan, the facilities department must sell to everyone under threat of competition from outside private service providers. The maintenance department is forced to both market and sell its services as well as provide them competitively.

Clearly the maintenance department is affected when it must survive as a quasi-corporate business. This new dynamic is very threatening to some. Others welcome the chance to demonstrate real accountability for their operations. However, the other concern is that of adequate long-term maintenance of the building assets. Is each dean interested in funding both routine and capital maintenance in a responsible manner? The initial results at Harvard suggested they would not provide for the "stewardship" of the campus facility assets. Many departments managed maintenance services very poorly during the initial

years of this program. The system is more structured now.

At the University of Illinois at Urbana-Champaign, Terry Ruprecht reports that the university has not considered how to control the facility management efforts of each department. As such, he feels that it will be up to his staff to educate and "sell" the department heads on the merits of long-term facility asset management. Will they always make decisions that represent responsible management of campus building assets? Naturally there is concern that short-term thinking might prevail. In one possible scenario, Ruprecht's staff may be called upon to manage and control a myriad of service contractors employed by the various deans. The interaction between the facility operation professional staff and the purchasing department will certainly require more time and resources. Ruprecht has suggested to his business office that each outsourced contract include an override of 4 percent to pay for the proper specification, management, and inspection of service and construction contractors. Standardization and performance criteria will be become critical.

At a minimum, RCM greatly increases the management and coordination responsibility of the in-house plant operations. Bob Dillman, chief facilities officer at the University of Virginia, sees this role as critical. He and his staff feel that while it is possible for individual colleges to buy services from outside suppliers, there must be control. To manage this, Dillman asserts that the colleges must buy services "through" the facilities department but not necessarily "from" the in-house service group. In this format the colleges can still "price check" the in-house service group, yet they are guided and managed into making responsible service purchase decisions. This expanded role of the plant department is related to all

forms of maintenance for each college. This owner representation role represents one of the pitfalls of RCM.

Prior to RCM the facilities department of any university had the task of creating, selling, and implementing the facility renewal and reinvestment program one time each year. This involved the senior administrators and staff of the plant and the budget officers of the university. Under RCM, the plant staff must take its "traveling" facility reinvestment program to each and every resource manager at every college. The difficulty in convincing one resource manager to allocate funds for deferred maintenance and capital renewal grows exponentially. The resource manager at each college must first be educated about long-term facility asset care. Then a program must be mutually agreed upon and funded.

In theory, this is done for each and every college. The facilities department will be stuck with a variety of plans to execute. The human resource cost to implement and manage this process will increase drastically for the plant. No new funds have been allocated for this increased overhead cost at any of the aforementioned institutions utilizing RCM. As Jay Klingel, the director of business management services at UVa, stated: "There are a number of things associated with capital renewal and RCM that we are still working through."

Beyond the education and selling of long-term asset care is the funding of the same. The campus-wide fund for maintenance is divided into a number of much smaller "pots" under RCM. Dillman sees this as a potential difficulty on the horizon. Even with a solid planned and preventive maintenance system in place, there are years where major systems require replacement. In unlucky years, large systems fail without any warning. The large campus-wide general maintenance
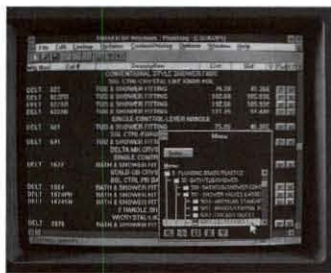
fund was normally capable of handling these spikes under the traditional system. Most facility administrators either formally or informally guarded a percentage of the total maintenance funds for emergency or contingency.

Under RCM the small colleges are faced with a dilemma. What happens to the law school when the chiller fails? The replacement cost might exceed the total maintenance budget for the school year. A system of funding planned renewal and contingency is required. A portion of the operating funds must be set aside each year to fund renewal and contingency. These funds are pooled campus wide to provide for emergencies. An insurance system of sorts is created. Unfortunately, many state systems do not have the ability to carry and invest funds like this beyond a single year.

The idea of resource centered management illustrates confidence in the business management skills of college deans. Ultimately, this new accounting system may prove to enhance the performance of the campus budgets. However, the responsible stewardship of the campus facilities is vulnerable. The facility maintenance department is faced with increased technical and management responsibility. The continual struggle to educate academicians and resource managers on the merits of long-term facility asset care become far more complex. Facility management professional will increasingly see themselves in the "selling" mode. In addition, the planning and provision of resources for large system renewal is incomplete under RCM It is clear that RCM has staying power in our industry. It is also clear that we as facility management professionals face new dynamics and as yet some unseen consequences. ♟

Whether you need to estimate the cost of a maintenance project or obtain three bids for a purchase order, let your fingers do your walking and talking. Trade Service Corporation's timesaving CD-ROM, TRA-SER for Windows, delivers fast access to product data and prices for thousands of maintenance and construction items.

Specifically, it lists more than 120,000 electrical, 122,000 plumbing, and 125,000 HVAC items. Data stays current if you have a modem and use Trade Service's Update Express dial-up connection.

This electronic catalog provides 24-hour access and can help foremen, project managers, and estimators gather the prices and descriptive data they need. In addition, it can be an integral part of a purchasing process, especially effective when you need to write and track materials contracts, audit contract prices, and order materials.

The price of the TRA-SER for Windows Electronic Catalog ranges from $800 to $1,100 per industry per standalone computer. For networks, the cost rises to $1,100 to $5,000 per

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single industry depending on number of concurrent users. The product runs under Windows 3.1 and Windows 95.

Material Matters

While I was researching TRA-SER, Trade Service's representative alerted me to a second product that stands out in terms of benefit to facility managers, their Material Safety Data Sheets (MSDS) Service. Trade Service claims that they have the world's largest collection of the sheets and keep them current. You get access to the sheets through several venues; fax-on-demand, call up, and custom server access, for example.

Prices varies widely depending on numerous factors including the number of employees, number of locations, number of MSD sheets you want ac-

cess to, and ancillary services requested. Ancillary services include Regulatory Reporting, Chemical Spill Hotline, Medical Emergency Hotline, and DOT Placarding. Call for more information.

Trade Service Corporation
San Diego, CA
1-800-854-1527
http://www.tra-ser.com

The British Are Coming

And they are bringing a real estate and asset management system with them. Called Prism*MM (no relation to the U.S.-based Prism Computing

Systems), the system contains all of the requisite functionality needed to competently automate facility management. I briefly looked over the system but in enough detail to recognize that it competently meets the first benchmark: it has a real estate/space focus. Too many of the 300+ packages currently available are designed for use industry. While they do a fine job of maintaining drilling equipment or reactor cooling systems, they crash and burn when faced with handling space-oriented demands.

From my flyby of the product, I'd place it in a price and performance category with Prism's FAMIS, PSDI's Maximo, and Innovative's SPAN FM. It runs under Windows (3.1, NT, and 95), UNIX, and hard links to AutoCAD. Typical of higher-end systems, it uses the Oracle database manager.

One module, Assessment and Inspection, appears particularly far-sighted. Apparently, this module predicts upcoming maintenance demands. It seeks to identify and prioritize the major building and system assets that are likely to need replacement within a time period that you establish, typically ten years. Its three major components consist of a condition assessment, priority matrix and long-range maintenance planning.

One possible perk, if you want to check out existing sites, you might get to visit England.

Cintra Systems
New York, NY
212-481-6501 (v)
212-213-5827 (f)
http://www.cintra.com

E-mail signature of the month: "Some mornings it's just not worth the effort to gnaw through the leather straps."

Starting Over

My favorite example of this is the manufacture of cabinetry for office or laboratory renovations, something that we do often in most colleges and universities. Left to their own devices, most of our internal cabinet shops will want to use the best possible materials and standards of workmanship. But this may not be what the customer really needs, or can afford. The American Woodworking Association publishes a wide range of quality standards, much like the "good, better, and best" that used to be featured in the Sears, Roebuck catalogs. We should be helping our customers, first of all, to determine which of these standards will best serve their needs, and then to find the most economical source, whether its our own shops or an external contractor.

Conclusion

At this point many of you may be wondering if Bill Middleton has "lost it" in his retirement years. Even if they might work, these are rather radical ideas, and I recognize that you may not find it easy to implement even one or two of them at your institutions.

To successfully implement the kind of change we need in the way we, our facilities units, and our institutions manage their facilities assets will require that facilities officers develop an ability to look far beyond the limits of their current organizations and practices. We must visualize the very different practices that can permit us and our institutions to achieve radical and innovative improvement in the productivity and effectiveness of facilities services, and in the utilization of higher education facilities.

Even if the ideas I've put forth here won't work for you and your institution, we hope that this discussion will at least encourage each of you to begin thinking far outside your present boundaries to begin visualizing the kind of change that *will* work to bring about fundamental change. There will be many different ways to get there, and which ones work best will vary among institutions. The one thing we can be sure of is that "status quo management" will not get us to where we need to be going.

The Bookshelf

Book Review Editor: Dr. John M. Casey, P.E.
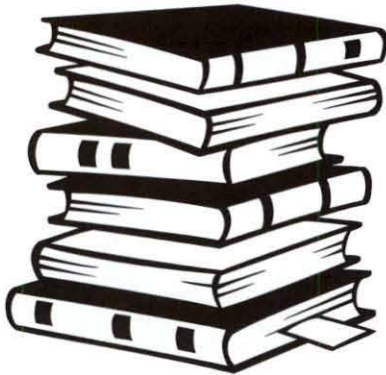
The books reviewed in this issue cover two broad categories, and both are important for facilities managers. The first area is management, and three reviews of Crisp Publications' generic management books offer suggestions for self improvement in dealing with real-world problems. Robert Casagrande of Southern Methodist University discusses methods for achieving consensus in group decision making situations. Douglas Garland of Bob Jones University reports on strategies for preparing to face changing work concepts in the future, and suggestions for promoting leadership from within an organization through systematic succession planning are discussed by Joseph Hack of the University of North Carolina at Wilmington.

The other category of reviews involves important technical topics which affect the operation of most APPA institutions. Larry Thompson of

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Oklahoma State University reviews the world of direct digital controls for HVAC systems, and Robert de Laar of Georgia Southern University discusses energy audits and balancing methods for these systems. Finally, Chris Wierda of Washington University in St. Louis reviews a major work on cost planning and estimating for maintenance of facilities published by the R.S. Means Company.

Everyone who takes the time to read the following reviews will benefit from the effort and expertise of the writers.

—JMC

* * *

Achieving Consensus: Tools and Techniques, by Jon Scott and Eileen Flanigan. Menlo Park, California: Crisp Publications, Inc., 1996. 90pp, softcover.

The premise that Crisp 50-Minute™ series books can be actively read in less than an hour is attainable for most readers, especially those for whom the books are marketed. I took three days to explore this one, but I was at a facilities conference at the time. My point is that this self-paced, self-study primer can put be started, set aside, and resumed several times without losing any ground. This is a real benefit to those with limited free time, and who doesn't fit that description?

Comprehensive exercises, activities, assessments, and case studies are dotted throughout this publication to increase understanding and capture your interest. It may not be as captivating as a Stephen King novel, but then again, it is not meant to be. A final assessment is found in the back of the book. Its 25 multiple choice questions offer a look at what you

have learned. The answers are provided with reference locations to research them.

Consensus is a process as purported by Scott and Flanigan, and achieving consensus combines different ideas, people, and approaches to provide a framework to create a solution. The emphasis is on *different* because the authors hold that unity derives value from diversity. While the continual act of achieving provides the action within the book, the ultimate goal is to align the power of the individuals in the group to accomplish prescribed tasks. A paradigm shift from individual achievement to group success is the common thread that ties it all together. This shift causes an interesting

paradox: to achieve group success, each individual must contribute to the group, and diversity yields conformity.

The authors travel a parallel journey of individual and group. They explore the individual as related to the group, and furnish the tools necessary to provide value to the team assignment. An underlying current is that group members should be having fun while the excursion reveals new insights. Achieving consensus is presented as an allegory via a trip to Consensusville (no kidding!). Consensusville has a small town feeling of trust and achievement. The book has a smattering of analogies to help the reader recall the lessons taught.

Information is expressed clearly. Each chapter (there are only six) states its learning objectives and displays cartoon graphics to illustrate important points. Each is followed with five to ten true-or-false questions to check comprehension and reinforce lessons. Pages are not cluttered; plenty of white space is allowed, and that is conducive to learning without being overwhelmed. Personal skill inventories assess progress as a way of penetrating one's self awareness.

The first chapter defines consensus essentially as the power of the group aligned to unleash the power to get things done. Analogies abound in the second chapter on your road trip to Consensusville. What to pack, choosing your destination, mapping your route, preparing for obstacles, and other highway hyperboles are discussed. Chapter three addresses other destinations—places like Votesburg where the majority rules or Bosstown, a place of unilateral decisions.

In a few areas, questions are posed for the reader to consider. There is a space to write the answer in the book but it is much too small for an essay question such as "Think of a past positive or negative experience. What did you learn from that?" Emphasis and

reinforcement of key ideas are generously peppered throughout this and other sections of the book.

In the next chapter, "Meeting to Achieve Consensus, Your Companions," the authors attempt to reinforce the association of individuals in the group by comparing it to making, mixing, and molding iron into steel. The point becomes lost in this analogy. "Let's make steel" does not help but hinders the "blending of

individuals" concept. This chapter is redeemed by demonstrating the benefits of establishing rules of the road, agreeing on why the group is meeting, and focusing on desired outcomes— all great ideas. The authors are right on track with the parable of the lemon. This is a good one and really drives the point home. Sorry, if you want to know the parable you will have to read the book.

Chapters four and five offer tools and techniques. Topics dealing with conflicts, dominant behavior, handling anger, and withholding information are covered here. Also discussed are effective ways of dealing with lack of participation and an unwillingness to compromise. These stumbling blocks can turn into brick walls. Missing key players, unbalanced power relationships and splinter groups are addressed in these, the best sections of this book.

Finally, you arrive at Consensusville. On your journey you learned you should trust people. You must give people the benefit of the doubt and you should listen because people like that. You have accomplished the goal. Now its time to celebrate the milestone! Hopefully, you had fun getting there. There are several quotations throughout this book. The best description of consensus was offered by Benjamin Franklin, "We must indeed all hang together or assuredly we shall all hang separately."

The Bottom Line: This is not a just a one-timer, it is a reference book as well. It is well worth reading, particularly for those new to group decision making.

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Southern Methodist University
Dallas, Texas

* * *

HVAC Energy Audit and Balancing Forms Manual, by Herbert C. Wendes, P.E. Lilburn, Georgia: The Fairmont Press, Inc., 1996. 232 pages, softcover.

The better organized the approach to a project, the better the result of the investigations. In his book, *HVAC Energy Audit & Balancing Forms Manual*, Herbert Wendes stresses the need to be organized when undertaking the tasks of balancing new or existing building systems,

conducting an energy audit of an existing building or of a new design, determining indoor air quality, performing engineering calculations, or developing cost estimates.

The author's method of accomplishing each of the above five objectives is to outline the manner in which the issue is to be handled, do the necessary studies, and then record all the required data on prepared forms. There is no debate as to the soundness of this approach especially since it and the forms were developed and refined by Wendes based on numerous projects and the many lessons learned in more than 20 years of personal experience.

The book is essentially what it purports to be—a forms manual with approximately 45 different blank forms. It does, however, go beyond balancing and energy audits. These two subjects and the sample completed forms comprise about one-third of the volume. Another 10 percent is given to an appendix of charts, graphs, and tables. The remaining portion of the book describes Wendes' approach to determining indoor air quality and estimating mechanical portions of a construction project.

The explanation of each of the presented forms describes what is to be entered into each blank, space, or column. There is very little discussion of where, why, or how the various items are obtained, used, or required. Although most of the data to be collected should be intuitively obvious to the veteran observer, the newcomer could have difficulty without further explanation.

The chapter on indoor air quality barely skims the surface of this very complex issue. It outlines a few of the many intricate and involved aspects of this subject. Again, the outline serves to introduce some of the forms the author has found to be useful in measuring the quantity of various particles within a building.

The forms in the manual have been developed and work well for the author. This does not necessarily mean that the forms will be best way to collect and present the data for everybody and, to his credit, Wendes does allude to this issue.

In summary, the manual is a creditable cross-check for individuals who want to determine if their forms are appropriate. It's also a sound beginning for knowledgeable professionals to develop their own forms.
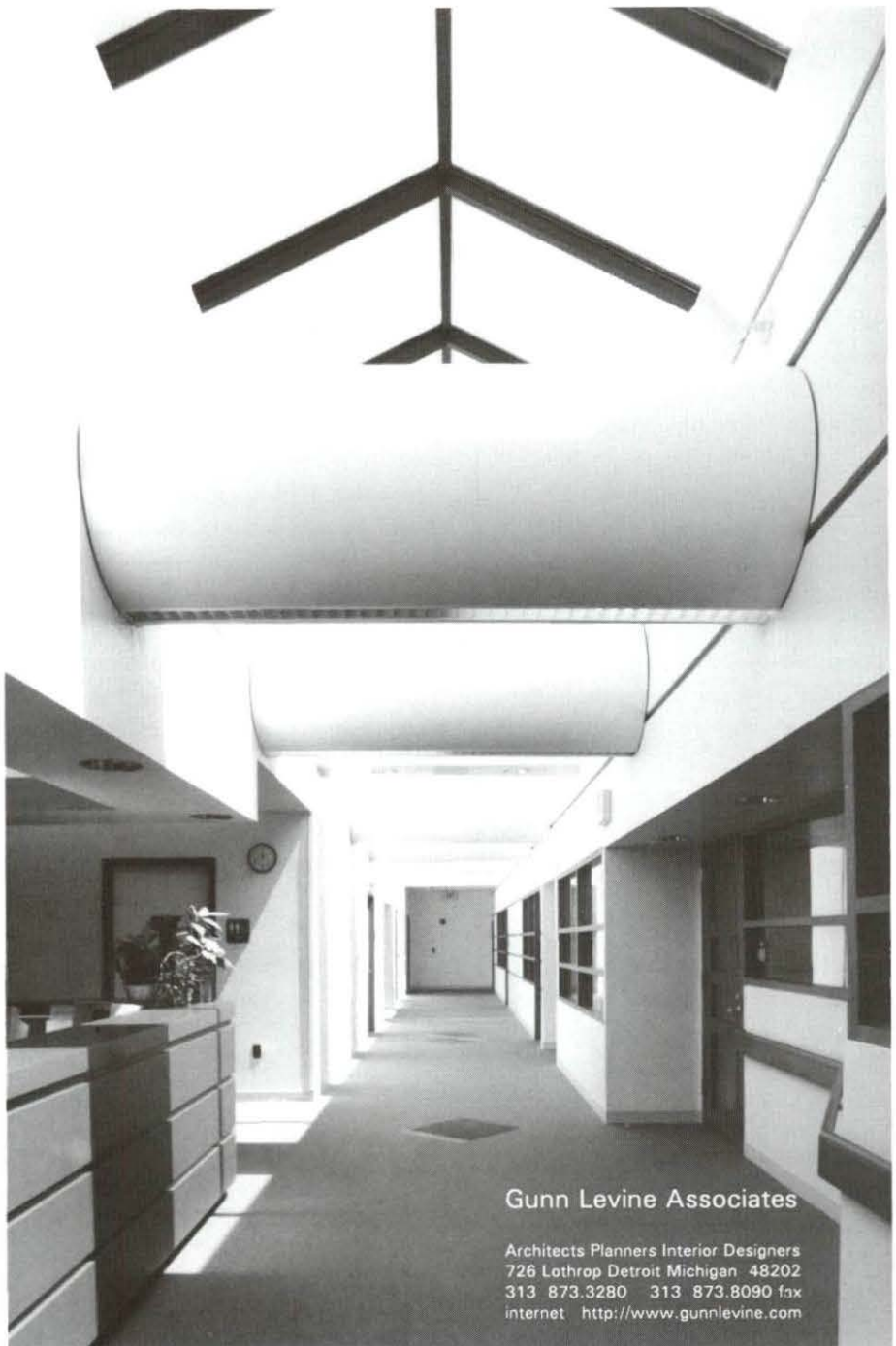
Robert A. de Laar
Assistant Director, Physical Plant
Georgia Southern University
Statesboro, Georgia

* * *

Work Concepts of the Future, by Patricia Schiff Estess. Menlo Park, California: Crisp Publications, Inc., 1996. 138 pp, softcover.

I fully admit to a fair amount of skepticism when first glancing at *Work Concepts for the Future*. The assumed thesis could either be a prediction of a brave new world in the workplace, or perhaps a diatribe aimed at convincing management to accept unorthodox employee demands. While simmering with skepticism, I also grappled in my office with the necessity of night and weekend work to adapt to academia, and with the potential loss of seasoned employees due to partial retirement. Others wrestled with overcrowding in key offices and the need to shift electric load to off-peak hours. Patricia Estess' balanced approach to managing changing employee schedules also provided new options for some old and all too familiar facilities management problems. Why not promote telecommuting or flexible schedules to save utility dollars or to postpone the office expansion project? The manager's fresh ideas and resourcefulness should impress even the toughest financial officer or vice president.

The author begins by accurately describing the factors driving alternate schedules in today's workplace. The list of the ten most commonly used alternatives is very helpful. Chapter two confronts the barriers to flexible scheduling by offering numerous suggestions to garner needed support and understanding. Subsequent sections deal with the benefits and pitfalls of each variation. Every situation addressed will not be applicable to the university work place, but many do provide good insight into tailoring employee desires to corporate productivity.

I give the book high marks for readability. The author uses short chapters, checklists, exercises, examples, and simple definitions to involve the reader and maintain interest. The balance between solutions to employee concerns and answers to upper management curiosities gives the

volume refreshing credibility. Managing alternative work arrangements may not naturally pique the facility manager's interest, but at least the material is well presented and easy to use.

Paragraphs entitled, "No Easy Answers—No Right Answers," finally vanquished my skepticism. How should the boss respond to a request from a worker with great informal leadership abilities who wants to telecommute four days per week? Estess does not offer an answer, but does provide a framework for the decision. Work Concepts of the Future is a balanced treatment of difficult employee issues. The analytical, innovative facility manager's use of this tool could well aid in the retention of an increasingly scarce asset, our skilled employees.

> **H. Douglas Garland**
> Manager, Utility Services
> Bob Jones University
> Greenville, South Carolina

* * *

Systematic Succession Planning; Building Leadership from Within, by Rebecca Luhn Wolfe, Ph.D. Menlo Park, California: Crisp Publications, Inc., 1996. 126 pp, softcover.

For those wondering how they might go about establishing a program to select and develop their organization's most promising internal personnel and prepare these personnel to fill key positions at some time in the future, *Systematic Succession Planning* will provide some insights and methodologies for such a course of action. The book is one of a series of self-paced, self-study books published by Crisp Publications for development through self-study.

Systematic succession planning is defined as "a defined program that an organization systemizes to ensure leadership continuity for all key positions by developing activities that will build personnel talent from within."

Having defined the terms, the author proceeds to make a case for the establishment of such a program and discusses the differences between succession planning and replacement planning.

Subsequent chapters address methodologies for the development of the program, the various requirements necessary to make it viable within the organization to include defining responsibilities, identification of those key positions which should be considered for inclusion in such a program, forecasting of future needs of key positions, development methods for internal talent, internal promotion policies, and choosing of a succession plan design. Finally, it addresses analysis of the succession plan results.

All the information is provided in a format that is more or less an outline with notes, charts, and checklists. It provides useful insights into the proposed planning system and related methodologies, but the format does not allow for smooth reading. In my opinion, this book would best serve as a workbook accompanying a seminar or video tape on the subject of succession planning.

For those at public-supported institutions, the question may be raised as to the applicability of succession planning for institutions operating within the framework of public hiring practices. While this topic is not specifically addressed, a customized version of succession planning could be developed and introduced into the organization which would assist "home grown talent" to compete in open recruitment pools.

As noted in the text and is true of many programs, in order to become effective within the organization, the program will require the real support of upper management and dedication of some amount of resources. The concept presented, however, can provide for retention of your most talented personnel and improvement of morale through the possibility of internal advancement.

> **Joseph S. Hack**
> Director, Physical Plant Department
> University of North Carolina at Wilmington
> Wilmington, North Carolina

* * *

Controls and Automation for Facilities Managers or Efficient DDC Systems Implementation by Viktor Boed. Radnor, Pennsylvania: Chilton Book Company, 1996. 267 pp, hardcover.

Today, in most facilities, tenant comfort has higher priority than it did in the days of the energy crunch. Utility, heating, and air conditioning budgets are often strained in these days of "do more with less." Meeting the conflicting requirements most often falls to the one to 2 percent of project construction dollars spent for environmental controls (now most often direct digital controls—DDC) and building automation systems (BAS).

Boed proposes improving controls operations by a controls implementation methodology he calls Global Commissioning/Total Quality Management (GC/TQM). In an ideal situation unfettered by time, talent, and money constraints. This approach should achieve a completed facility with no first-year surprises. The process Boed advocates is highly desirable if somewhat impractical. Not all locales are created equal, nor are DDC systems, their vendors, or the facility's needs.

A key player for Boed is the commissioning agent (CA), described as one who understands and supports TQM, and who further knows engineers of various disciplines, construction personnel from various fields, the strengths and foibles of numerous DDC systems on the market, and facility maintenance concerns.

The availability of qualified CAs and knowledgeable, unbiased control systems engineers are two unaddressed real-world prime concerns. Most system engineers are employed by the DDC/BAS manufacturers or their distributors.

Boed's treatment of many topics is incomplete. For instance, he mentions, but does not provide guidelines to assess the benefits and problems of going from sole-source procurement to the other extreme of totally open competitive bid. The section on BAS materials is uneven and appears to be collected from a series of clippings.

The recommendation of a standard facility specification is excellent. However, the "performance spec" provided should not be used without thorough revision from a local, knowledgeable, and trusted source. The omissions and gaps could be hazardous to the casual user.

The section on controls is a conflicting conglomeration of somewhat proprietary specs from different sources. The chapter on "Prequalification of DDC Systems and Vendor Selection" is something of a primer on DDC. Use this little bit of knowledge only as an introduction before getting competent advice.

Reading this book will sensitize a facility manager to recognize when he has a valuable resource in a person knowledgeable in end needs, heating and air conditioning system capabilities, construction contracting, controls design and application, and good BAS utilization. It is a possible source of information for those who want to be less uninformed about the complex sphere of DDC/BAS controls.

This book could be read to glean what you should or could be getting from your vendor. This book could be read to see what an ideal vendor will provide, and then the reader can start a search for who comes closest. This book could be read to get an appreciation for the complexity this small, often overlooked, usually delayed to the last minute of design, or construction, activity really entails.

However, this long, involved book requires a determined reader. An increased number of shorter, more focused chapters with the bulky "supporting documentation" (such as the numerous checklists) in relevant appendices would make the book more readable and "user friendly."

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Cost Planning and Estimating for Facilities Maintenance. Kingston, Massachusetts: R.S. Means Company, Inc., 1996. 472 pp, hardcover.

Anyone who has used R.S. Means cost information for yearly, detailed updates of their construction cost files understands the level of detail and completeness of which this company is capable. This book is no exception.

Anyone who has tried to handle a significantly complicated task (taking over a new department, designing and building a building, etc.) knows the success that can be expected by staffing the assignment with seasoned facilities professionals who have learned their lessons by experience, some the hard way. In *Cost Planning*, 20 such seasoned facilities professionals provide up-to-date, detailed coverage of their areas of expertise and, as the book states, "good maintenance management happens when competent facility's professionals join their customer's team and do the right thing—together."

There are five parts that take the reader through a form of management problem-solving. Part one introduces maintenance planning and budgeting in the context of the overall costs of owning and operating a facility. Six chapters help the reader determine the status of their current needs: a proforma that presents the entire cost picture, an introduction to capital planning, an analysis of the outsourcing decisions, benchmarking (goal setting), computerized maintenance management systems, and, finally, applicable codes and regulations that must be considered.

Part two presents a review of major building components. Roughly formatted in the sequence in which they might be built (foundations, first; landscaping, last), these sections address the most pertinent issues for each building element, thus helping the reader focus on the building systems of greatest concern and on what must be done to keep them in safe and efficient operating order. Facility audits are used to segregate major, minor, urgent, or long-term maintenance and repair, for short-term and long-term financing. A sample maintenance schedule is provided.

Part three assigns costs to planned maintenance and repair in a manner similar to R.S. Means construction cost tables including a step-by-step "how to" section. These chapters address maintenance and repair estimating, preventive, and predictive maintenance estimating and general maintenance estimating (custodial maintenance or cleaning). Part four provides full chapters that address specific maintenance considerations for different building types (apartment buildings, educational facilities, museums and libraries, etc.). Part five "puts it all together."

This is not a book that one sits down and reads on a rainy day from cover to cover. However, it is a book that would be excellent as a reference book or as a text book in a construction management or architecture program. It is hard to get this much practical expertise under one cover. Different sections could provide periodic reminders of key problems areas to anyone responsible for planning a

maintenance program or for capital planning project people trying to avoid past pitfalls as they review the design development drawings of their next project.

Chapter 22 covers "Educational Facilities." It takes the reader through how higher education is funded (thus providing context), a description of an "average" campus (thus illustrating the physical environment and diversity of such a complex place), a list of characteristics somewhat unique to the higher education operation and maintenance environment, and some detailed discussion of these latter items. For example, one section describes why standards, such as establishing and communicating how often one might expect one's office to be painted, are necessary thereby providing insight into the sensitive issues of the daily work environment that need to be considered. Another section describes the advantages of mingling with the campus community and still another details who the customer is and how sensitive he or she might be to how "their" money is being spent. There is no standard approach but there are areas to which one should be sensitive.

Chapter nine dissects the omnipresent area of interior finishes. This area carries with it image requirements as well as issues related to whether the area functions as well as it can. Under ceramic tile common defects are defined (cracked or broken tiles), cleaning needs are described (non-abrasive and periodic), and repair approaches are discussed. These chapters provide good insights and reminders of detailed issues as each entity (plaster, drywall, acoustical tile, etc.) is reviewed in similar format.

The merit of the book lies in its detail and credibility. Will it provide any great insight to the practitioner? That depends on how much experience in each area one has had and, perhaps, how recently. The book is ideal as a handy reference guide for the experi-

enced manager needing a boost while trying to reach back into a storehouse of knowledge. The book is also a handy reference guide for the manager who wishes to expand his or her knowledge of certain, currently non-existent, building types or maintenance areas. To a student or young professional involved with cost estimating or building design, the book provides years of experience concerning various items that may
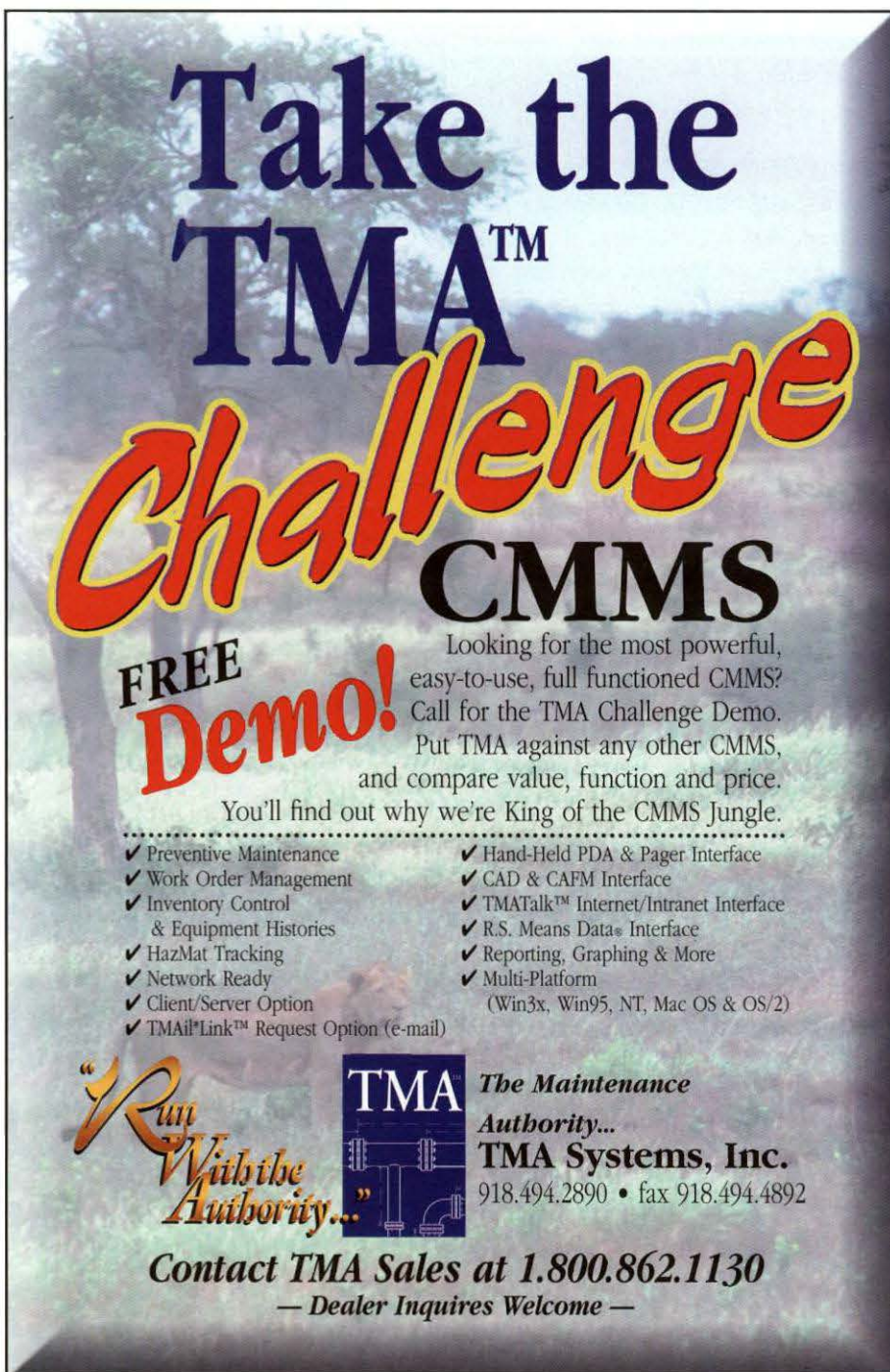
not be quickly learnable otherwise.

The final part of the book offers guidance for the budgeting process for the experienced facilities professional with respect to how all the previous parts might be used to help create the annual or multi-year plan. This professional thinks it is accomplished quite well.

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Coming Events

APPA Events

For more information on APPA seminars and programs, contact the APPA Education Department at 703-684-1446, ext. 230 or ext. 231.

Jan 25-30, 1998—*Institute for Facilities Management.* Houston, Texas.

Aug 2-4, 1998—*Educational Conference & 85th Annual Meeting.* San Jose, California.

Regional Meetings

Oct 5-8—*ERAPPA Annual Meeting.* Toronto, Ontario, Canada. Contact Bob Carter, McMaster University, 905-525-9140.

Oct 12-15—*MAPPA Annual Meeting.* Columbus, OH. Contact Becky Hamilton, Ohio State University, 614-292-1380.

Oct 18-22—*CAPPA Annual Meeting.* Omaha, NE. Contact Ed Bogard, University of Nebraska Medical Center, 402-474-6307.

Other Events

Oct 15-16—*New England Gas Purchasing and Technology Expo.* Boston, MA. Sponsored by Boston Gas.

Oct 15-17—*12th Annual IDEA Cooling Conference.* Cleveland, OH. Contact IDEA, 202-429-5111.

Oct 15-17—*Hazardous Substances Management and Response: Health and Safety Issues.* Salt Lake City, UT. Contact Registration Coordinator, Rocky Mountain Center for Occupational and Environmental Health, 801-581-5710.

Oct 16-18—*Conference on Improving America's Schools.* San Diego, CA. Contact IAS Conference Hotline, 800-203-5494.

Oct 16-18—*Restoration '97.* Chicago, IL. Contact EGI Exhibitions, 508-664-6455.

Oct 20-22—*Wholesale and Retail Wheeling in North America: Targeting New Opportunities and Understanding New Markets.* Toronto, ON. Contact Institute for International Research, 800-461-2398.

Oct 23-25—*NACAS 29th Annual Conference.* Boston, MA. Contact NACAS, fax 540-885-8355.

Oct 25-29—*Facilities America '97.* Las Vegas, NV. Contact Association for Facilities Engineering, 888-222-0155, ext. 22.

Oct 27-31—*National Fire Alarm Code & Automatic Sprinkler Systems Seminar.* Portland,OR. Contact NFPA, 800-344-3555.

Oct 28—*Groundwater Resource Management: Pollution Sources and Remedies.* New Brunswick, NJ. Contact Suzanne Soules, Rutgers Office of Continuing Professional Education, 732-932-9271, ext. 616.

Oct 28-30—*Telecommunications Infrastructure Planning.* Chicago, IL. Contact Kalista Bernardi, Washington State University Conferences, 800-942-4978.

Oct 28-30—*MetalCon International '97.* Atlanta, GA. Contact Claire Kilcoyne, MetalCon, 800-537-7765.

Nov 2-5—*27th Annual Educational Conference of the National Institute on Park and Grounds Management.* Houston, TX. Contact National Institute, 414-733-2301.
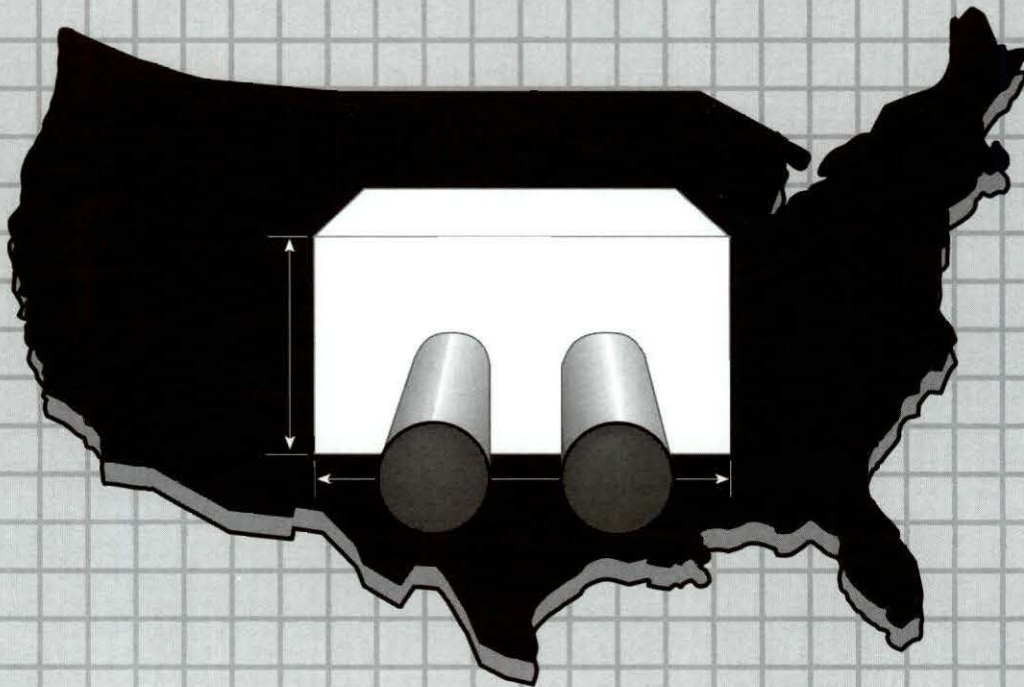
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