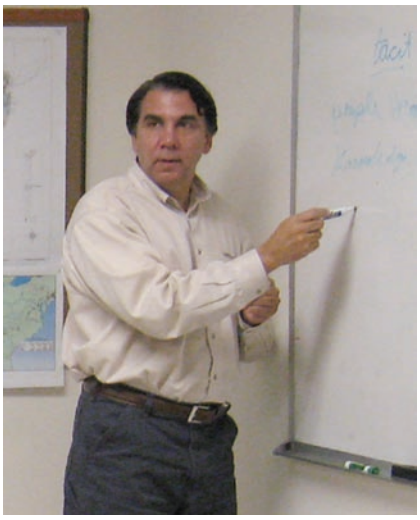
Maximizing and retaining the value of human, physical, and digital assets

An interview with **Dr Robert D Mayfield**



Managing an electric-power generation business efficiently and profitably is no easy task. It includes protecting major physical assets against damage over their multi-decade lifetimes, keeping current on maintenance and repair practices, learning and implementing new digital technologies to improve process control and communications, etc—all while navigating federal, state, and local regulations and ensuring compliance and safety at every level of operation.

In addition, there are staffing concerns. Perhaps the most compelling challenge facing the industry today: The current workforce is graying rapidly and relatively few qualified workers are entering the field. Critical to addressing workforce and other plant-level issues, according to Dr Robert D Mayfield, is knowledge management (KM). Simply put, KM processes make new strategies and tools available to generating companies for gaining competitive advantage.

Few in the generation sector understand this as well as Mayfield, who recently earned a doctorate of Management in Organizational Leadership. His research and thesis focused on the implementation of KM in powerplants. Mayfield's laboratory: the 3 × 1 F-class combined-cycle facility that he manages.

The editors, who know Mayfield from his plant's success in the Best Practices Awards program sponsored by the COMBINED CYCLE Journal and through his participation on the steering committee for the 7F Users Group, asked him to explain KM to his industry colleagues. The information shared by Mayfield is presented in a Q&A format and published in two parts—in this issue and the next.

Here you'll learn the basics of KM, organization cultures and learning processes, how to capture and share best practices and lessons learned, the difference between explicit and tacit knowledge, and much more.

To begin, Robert, can you give us a simple definition of what you mean by knowledge management?

Knowledge management refers to a systematic and integrative process for coordinating enterprise-wide activities associated with acquiring, creating, storing, sharing, diffusing, developing, and deploying knowledge by individuals and groups in pursuit of major organizational goals.

Every organization is built on a knowledge base. But one that makes the right knowledge available to the right person at the right time continually improves its performance and can gain significant competitive advantage.

> *"Knowledge management helps make sure mission-critical knowledge stays with the organization and is readily available when and where it is needed instead of walking out the door when an employee leaves or retires."*

KM processes are particularly important in view of our industry's workforce crisis. They help ensure that existing mission-critical knowledge stays with the organization and is readily available when and where it is needed, instead of walking out the door when an employee leaves or retires.

That certainly sounds good, but electric power producers have a history of parochial thinking. What are the main challenges they face should they decide to adopt KM processes?

Because the industry is parochial, or what I'd call hierarchical, the decision to integrate KM processes must be strongly supported and articulated by senior management. The reasons for adopting KM, and its benefits to both employees and the organization, must be reinforced loudly and clearly at every opportunity, at every juncture of the process. Knowledge management simply will not work if executives don't buy into it and employees don't see the need for it.

But there's one more thing—actually the most important thing—that has to change before KM can be fully adopted in our industry: The prevailing organizational culture must shift from a strictly hierarchical structure to a collaborative team culture. This demands encouraging and facilitating knowledge-sharing from the bottom-up and side-to-side to complement that from the top-down.

Organizations that transition to a team culture will find it much easier to attract the young talented engineers needed to replace retirees. The "best and the brightest" want to work in a "learning organization"—one that constantly evolves to meet technological, environmental, social, and market challenges.

What do you mean by organizational culture?

Organizational culture refers to the shared, basic assumptions that an organization learned while coping with its environment, adapting

to external forces, and integrating people and processes internally. There are four basic types of organizational cultures: team, innovative, hierarchy, and market. Here are key characteristics for each:

Team. Leaders are mentors and coaches, collaborative learning, employee commitment, good communication, employee participation, family environment, loyalty, concern for people and customers.

Innovative. Leaders are innovative and entrepreneurial, visionary, dynamic, risk tolerant, leading edge, seek and acquire new resources, encourage individual initiative and freedom.

Hierarchy. Leaders are controlling, formal structured environment, procedures and policies govern employees, command and control, authoritarian, dysfunctional management.

Market. Leaders are hard drivers, competitive, goal oriented, profit motivated, customer focused.

So, for an organization to successfully implement KM processes, it needs to adopt a collaborative—or "team"—culture. What guidance can you offer an organization attempting to change its culture?

Implementing change is 80% leadership (establishing direction; aligning, motivating, and inspiring people) and 20% management (planning, budgeting, organizing, and problem-solving). Leaders set the example for the organization. They must collaborate with peers and subordinates before those same peers and subordinates will collaborate with them and others.

Organizations can jump-start the change process by providing incentives and rewards for actions and behaviors that foster employee development and collaboration. But leaders must first loosen the reins and make sure that employees are engaged, challenged, and motivated to draw from and contribute to the organization. True leaders allow employees to try new things and fail every now and then. Everyone has to have a stake in the success and/or failure of a collaborative/team organization, and that means everyone gets a chance to shine and, perhaps, to fall flat on his or her face.

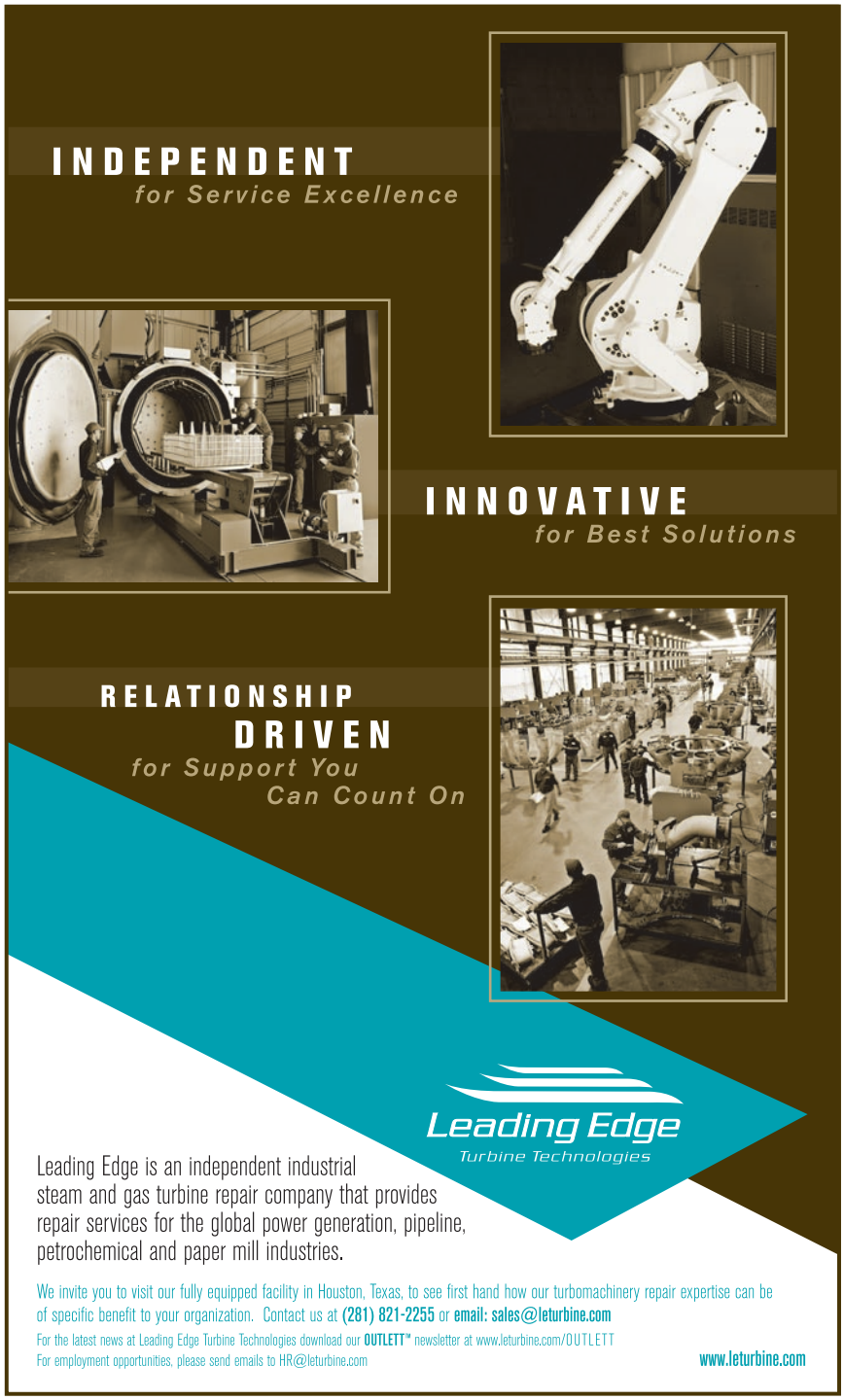
You mentioned the term "learning organization." Can you go into that a little more?

A learning organization is one that learns from its mistakes, determines the root cause of problems, provides effective countermeasures, empowers employees to implement those measures, and puts in place processes for transferring the new knowledge to the right people at the right time to make it part of the organization's repertoire of understanding and behavior. Learning from your mistakes sounds simplistic, but being a true learning organization takes a lot of hard work—and learning some hard lessons along the way.

How does being a learning organization or a team culture with knowledge management processes help address the industry's workforce crisis?

In my research, I found the retention, sharing, and use of industry, institutional, and technical knowledge vital for plant management, and also for the strategic planning needed to remain competitive as a business. The smooth transfer of knowledge between and among today's employees and tomorrow's is critical to achieving this goal.

But that's often lacking today. We all know we've got a lot of people out there ready to retire in the next few years, or planning to go to work for a competitor or in another industry entirely, yet many generating companies do not have succession plans in place for critical positions. In fact, 73% of the organizations represented



by participants in my own research have no succession plan for limiting the adverse impact of non-retirement attrition.

Whether it's the technician on the plant floor who has been there 30 years and can diagnose a problem just by listening, or a plant manager who can repeat whole paragraphs of regulations in his sleep, it's usually only when a resignation has been submitted that efforts begin to find a replacement. That's just not acceptable.

We can't allow mission-critical knowledge to walk out the door every time someone takes another job or retires. And we can't expect new hires to walk in the door and pick up where experienced, long-term employees left off. When we start expecting new recruits to immediately take on added responsibilities with less training, little mentoring and anemic knowledge-sharing, you can guarantee that recruit will immediately start looking somewhere else.

KM helps an organization address this problem by:

- Identifying and planning for the potential loss of experienced human capital.
- Attracting, hiring, and retaining new employees. Endeavors succeed or fail because of the people involved. Only by attracting the best can you meet the organization's demanding expectations.
- Conducting strategic workforce analyses to identify and plan for potential critical personnel shortages.
- Using strategic workforce planning models that apply the plant's expected attrition and overlays key elements such as historical attrition causes, future capital programs, and potential outsourcing or alliance opportunities.

How exactly do you define "knowledge"?

There are two types of knowledge: explicit and tacit. The first is gained from documents, libraries, written policies and procedures, files, manuals, and databases. Explicit knowledge is articulated and codified and can be expressed in formal and systematic language. Our training programs address the "explicit knowledge" contained in written documents, technology manuals, policies and procedures.

"The prevailing organizational culture must shift from a strictly top-down, hierarchical structure to a collaborative, team culture."

By contrast, tacit knowledge is retained in a worker's mind. It is personal, rooted in an individual's experiences and actions, ideals, values, and emotions. Unfortunately, tacit knowledge, hard-won through years on the job, is not only the more subjective, but also is the most difficult to capture, formalize, and communicate.

Employees may feel obligated to share their tacit knowledge to new hires out of gratitude for their long employment or simply because they believe sharing is "the right thing to do."

An example of explicit knowledge is the rules of baseball: nine innings in a game, three outs per team per inning, etc. Tacit knowledge is gained from playing baseball—such as knowing how to hit different kinds of pitches thrown at different speeds. It is only through experience and consistent practice that a player acquires the tacit knowledge needed to integrate the complex physical and mental processes required to hit a big-league curve, for example.

To be successful, an organization

must retain, share, and transfer both explicit and tacit knowledge. One way to do this is through participation in industry professional associations like the 7FA Users Group. Another is to organize within your company special working groups empowered to share knowledge among group members and with other groups.

Such face-to-face knowledge-sharing experiences in social settings are an effective way to get employees positively inclined toward KM. Some plant managers believe the "nuts and bolts" are the most important assets, but equipment won't work properly unless you develop and care for your human assets as well.

What do you mean by "human capital"?

Simply put, human capital is the experience, creativity, and skills of your workforce. It is the knowledge employees bring with them when they are hired and that which they gain while employed. It is what makes an employee valuable and

Knowledge-management imperatives

Knowledge-enabled culture	Information technology and blended learning	Strategic planning and measurements
KM infusion with organizational culture	IT-enabled networks	Develop strategies to drive KM
Phased KM implementation	Mission-critical knowledge identification process	Homogeneous information infrastructure—employees and business processes
KM applications and vision	IT process, roles, and responsibilities	Avoiding KM disruptions
Mutual trust and respect	Knowledge storage—policies and procedures	Competitive advantage and organizational performance
Cross-functional and cross-business teams	Web-based interactive learning	Individual and organizational feedback
Motivated, empowered workforce, mentoring and coaching	Knowledge capture, sharing, and transfer	Six Sigma and Lean Six Sigma measurements
Recognitions, rewards, incentives, and promotions	Identify best practices, benchmarking, and lessons learned	Customer access to organization's knowledge base from any location
Kaizen principles	Security and confidentiality Capture and coding of knowledge	New technologies to capture knowledge —IPODs, PDAs, and cell phones Creative and innovative

what that person takes into retirement or to his or her next job.

Organizations do not own human capital, employees do. Some companies are just realizing this, having gone decades with low turnover and access to a rich talent pool. The "new reality" demands emphasis both on retaining high-performing employees and on transferring knowledge from experienced personnel to new hires.

Human capital is a critical strategic element that determines competitive advantage. Progressive organizations import, share, create, use, transfer, repurpose, and/or reuse knowledge and convert it to information that creates value and profit. Employees in these companies never stop learning and contributing to the organization's competitive advantage.

What's most important for implementing a culture that embraces knowledge management?

My research identifies these three imperatives as being most important for measuring the degree of implementation of KM processes in the electric generation sector of the industry: knowledge-enabled culture, information technology (IT) and blended learning, and strategic planning and measurements. The table summarizes this effort.

A knowledge-enabled culture really just means a system of aligned HR policies, tactics, processes, and practices that ensure knowledge is captured, created, shared, used, and reused to achieve superior organizational results for sustainable advantage. That's a mouthful, but it's important. You can't just hoard knowledge; it must be shared, used, and reused to gain maximum value from KM.

> *"Seventy-three percent of the organizations represented by participants in my own research have no succession plan for limiting non-retirement attrition."*

Many people think KM means IT or software. Not so. Just because you have software designed to help people share knowledge, it doesn't mean they will use it. But when IT is used to *facilitate* KM, the processes begin falling into place. In fact, IT and training on its use are essential to the efficient implementation of KM processes.

Important to note is that there is no one "correct technology" for KM implementation. Two points to remember when evaluating IT to support KM processes:

- Manpower and know-how are vital for keeping the KM system current. Accurate, assessable, and usable organizational knowledge relies on building repositories, databases, and knowledge maps and continually updating them.
- The IT you select must be user-friendly and allow members of the organization to connect easily. Integrated information management systems facilitate access to policies and procedures, best practices and lessons learned, and work planning and control. Plus, they allow members of the organization to quickly identify and contact subject-matter experts. CCJ

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