Stemming the brain drain

By David W. De Long and Thomas O. Mann

Knowledge loss, often an unintended consequence of downsizing, can be one of the costliest problems confronting organizations today. It is also one of the most widely ignored. Better workforce planning and targeted knowledge-retention initiatives can help you avoid losing this key source of competitive advantage.

At 5:30 one December morning in 2000, a loud blast rocked a small town on the US Gulf Coast; residents awoke to a scene of smoke and fire. An ethylene reactor had exploded at a nearby petrochemical plant, one of the town's largest employers. Fortunately, emergency response teams were able to bring the fire under control quickly and contain the toxins released by the explosion. A subsequent internal investigation found that the company's engineer and the operators in the control room at the time of the incident had all been on the job less than a year, and that they probably lacked the experience needed to prevent the accident.

As this dramatic example shows, knowledge loss, often an unintended consequence of downsizing or retirements, can be one of the costliest problems confronting organizations today. It is

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also one of the most widely ignored. This "brain drain" phenomenon is occurring in both the public sector and the private sector, including the chemical, utilities, oil and gas, healthcare, automotive, aerospace and defense industries.

Companies typically are not aware of the risk of lost knowledge until the damage is done. For example, no one expected anything but cost savings when a 1995 workforce reduction at Delta Air Lines sent many experienced mechanics out the door. But problems arose when the less experienced crews that succeeded them took longer to troubleshoot and repair aircraft, causing flight delays, cancellations, angry customers and a serious jump in Delta's cost-of-seat-per-mile. "It was a very expensive lesson," says Jim Smith, director of performance and learning for Delta's Technical Operations Division. So was the experience of a major credit-card company: A new analyst, unfamiliar with how the company ranked prospects, mailed solicitations to people *least* likely to respond rather than *most* likely.

An ongoing study by the Accenture Institute for Strategic Change has identified a number of consequences of knowledge loss, including compromised growth strategies, reduced efficiency and costly errors. Even innovation suffers—it may be a bit counterintuitive, but experience in doing things the old way is often necessary to do them in a new and better way.

Take the case of a veteran extrusion systems expert at a US chemical company. This employee had not only helped save the company millions of dollars by boosting the efficiency of its manufacturing processes; he had also helped create new products and revenue streams. When he retired, the company realized that bringing his replacement up to speed would take a year. The only way to sustain the pace of innovation was to rehire the old hand as a "consultant."

Doing things differently

A few pioneering companies have taken the lead in developing solutions to the problem of knowledge loss. Delta learned from its experience in 1995, and the airline handled things differently when the September 11 terrorist attacks made another workforce reduction necessary. Companies as different as Royal Dutch/Shell Group, Skandia, the National Aeronautics and Space Administration, and the Tennessee Valley Authority have implemented programs that help retain critical knowledge.

Three major considerations must guide a company's response to the threat of lost knowledge.

Timing: How soon will the knowledge be lost? Days? Months? Years?

When air traffic dropped dramatically after September 11, Delta had to cut its workforce. But the company was determined not to stumble as it had after its previous reduction in 1995. So when 11,000 employees companywide agreed to take an early retirement or severance offer, Delta had less than two months to identify which employees had jobs for which no backups or replacements had been trained, especially those with large internal and external networks—and then capture that knowledge before it walked out the door.

Supervisors across the board worked with a team from Delta's learning services unit to narrow the list of 11,000 down to those veterans whose departure would represent a "critical job loss." Once these

outstanding performers were identified, they were interviewed about their roles at the company. This way, Delta retained as much critical knowledge as possible on very short notice.

In contrast, the Tennessee Valley Authority, the largest public power company in the United States, has had more time to address the problem. Management realized in 1998 that years of downsizing had left the utility with a median employee age of 48. TVA surveyed its employees about their retirement plans. Although participation was voluntary, 84 percent of the workforce provided an intended retirement date (which they were free to change).

The company first assigned a score to each of these employees, quantifying the risk of lost knowledge, and then prepared staffing and succession plans to capture the critical knowledge that would otherwise be lost. The solution has included phased retirements (that is, moving these employees to part-time work) and mentoring.

Type: Is the knowledge explicit and rule-based, or tacit? Can it be documented? Must it be taught directly?
Knowledge can be divided into two broad categories: the kind that is easily documented, and the kind that is not. The first kind is relatively simple to deal with; the second is not. The design of knowledge-retention initiatives will always depend on the type of knowledge being transferred.

For example, a metals refinery uses a particularly dangerous production process involving two tanks. It suffered a setback worth millions of dollars in lost revenues when one of those tanks, which had recently been rebuilt, malfunctioned as it came back onstream. A similar problem had occurred 15 years earlier, the last time any tanks had been rebuilt. The company, which had forgotten any lessons learned from that previous experience, was now concerned about a repeat performance once the unit's other tank was rebuilt later that year. To avoid a similar problem, knowledge needed to be captured immediately.

The plant manager gathered everyone involved with maintaining and operating the sensitive equipment, and used a question-based reasoning software called PHRED to help make their tacit knowledge explicit. "I had always assumed people were withholding knowledge, but in reality they just didn't have a forum to share it," the plant manager reflected afterward. "The senior operators never had a way of sitting down with the younger guys and transferring what they know."

Topography: Is the problem widespread in the organization, or is it localized?
Practices for retaining knowledge may be applied broadly or narrowly, depending on how the organization views the problem. Siemens, for example, has tried to instill a broadly based formal procedure for retaining critical knowledge. Managers are responsible for identifying departing employees whose knowledge is both crucial and unique, and for making extensive efforts to retain that knowledge.

Shell has emphasized the use of communities of practice to connect widely dispersed employees in networks that enable them to pool their knowledge. One such network brought together geologists, reservoir engineers, petrophysicists and other scientists interested in turbidite structures. The group meets weekly, but members have formed one-on-one relationships that make knowledge transfer a daily event.[1]

Comprehensive solutions
Whether it's in chemicals, aerospace or government, knowledge loss is a systemic problem involving the entire employment lifecycle—recruiting, employee retention and retirement. One-off solutions, such as creating a database, introducing a mentoring program or using retirees as contractors, are merely quick fixes. Comprehensive problems need comprehensive solutions. Seven critical success factors make up a framework for successful knowledge retention.

1. Identifying knowledge at risk
Understanding where an organization is most at risk requires processes to identify which employees have the most critical knowledge. As noted, Delta, TVA and Siemens have developed such systems.

2. Career development and succession planning
A career development program builds knowledge that professionals need to prepare for future roles. Shell's chemical companies have created a technical skills management process to identify their long-term human capital needs and to help develop the skills required to, for example, bring new plants online. Global skill-resource managers make sure that Shell has people ready if vacancies occur in critical positions—in this case, process engineers, project engineers and manufacturing control engineers. Meanwhile, local skill managers focus on the short-term needs of each site, meeting with technical employees to assess current and future career interests, offering advice on skill development and new jobs.

"Our ideal situation is to have three people ready for each of our critical

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positions," says Cary Wilkins, manager of global HR processes for Shell Chemicals. "So if we have critical process engineering positions open in three sites, ideally we would want nine people in the pipeline."

3. Knowledge transfer practices
At the heart of any knowledge-retention strategy are the actual practices used to transfer knowledge. Among the many practices that contribute to knowledge retention are after-action reviews, communities of practice, mentoring programs, storytelling, expert referral services, interviews and training.

The type of knowledge involved determines the practice used. Tacit or cultural knowledge needs to be transferred through face-to-face interaction, such as mentoring or after-action reviews. But practical, explicit and rule-based knowledge doesn't need face-to-face interaction and can be transferred through training programs or technology-based systems.

Siemens has identified five questions its managers must ask when choosing a method for transferring valuable knowledge: How long will this knowledge be relevant? What types of knowledge are involved? How much time is there before the expert leaves the organization? What is the expert's level of motivation and capability for sharing knowledge, and the successor's motivation and capability for acquiring it? What are the costs of applying the specific methods of knowledge retention under consideration?[2]

4. Using information technology to enable knowledge capture, sharing and reuse
Most experiential knowledge cannot be captured in a computer system in a form that is immediately actionable. And because this type of knowledge is usually conveyed by observation rather than documentation, the same process may be described differently by different people—so even when this knowledge is successfully captured in a computer database, the employee may not search using the correct keywords and may never find the document. Despite these obstacles, IT still has an important role to play in many knowledge-retention initiatives. For example, Quaker Chemical Corporation has piloted an Intraspect software system in its R&D labs. The system makes it possible for experts to collaborate to solve customer problems and, at the same time, helps build a fully searchable knowledge base of e-mail discussions and documents for use in the future.

5. Phased retirements
As knowledge-retention and recruiting problems become more acute, companies are looking for new ways to extend the tenure of their most valuable employees. For example, TVA recently introduced an initiative called the Conditional Part-Time Employment Program. This allows employees who qualify to work part-time, drawing part-time pay, while retaining full benefits and continuing to accrue pro-rated annual leave. One objective is to entice those nearing retirement to stay on longer to mentor and train their successors.

6. Programs for effectively utilizing retirees
A growing number of organizations are becoming dependent on retirees as contractors or consultants. Many companies leave such arrangements to the discretion of individual managers. But a few have created more formal programs, like Monsanto Company's Retiree Resource Corps, to actually encourage the part-time reemployment of retirees.

After downsizing in the 1990s, Monsanto management recognized that too much essential talent was walking out the door. The Retiree Resource Corps, which offers former employees the opportunity to work up to 999 hours per year, usually has about 300 retirees working on R&D, IT, engineering or administrative projects. Salaries are negotiable.

"When retirees come back in the door, there's no training needed. They know the way Monsanto works," says a former lab director. "But when a college grad or Ph.D. walks into a new job here, you're looking at six months before they become productive."

7. Building a retention culture
Organizations trying to retain the knowledge needed to sustain performance must create a culture that makes knowledge capture, sharing and reuse normal, everyday practice. As a first step, this means management must determine if the current culture's values and norms undermine behaviors needed to preserve knowledge.

When leaders at NASA's Jet Propulsion Laboratory explored this issue, they found that *reuse* had a bad connotation in the NASA culture. According to Jeanne Holm, the lab's chief knowledge architect: "Employees want to say they figured it out themselves. That's one of our cultural problems and our strengths. So when we talk to people we call it 'adaptation' or 'adoption' of processes or technologies, not 'reuse.' "

Among the values most important to supporting a knowledge-retention culture are shared sense of mission, trust and commitment to the individual. Employees are much more likely to want to share their knowledge if they feel emotionally committed to the organization's long-term mission. Employees at NASA and TVA are often eager to share their knowledge because of their emotional investment in their employer's success.

Because intellectual capital frequently is the primary source of an individual's value to an organization, sharing it demands a great deal of trust. If people feel that they can survive in the company only by hoarding valuable knowledge, they will not share it. Do employees believe that the company is being managed in a way that considers their interests as well as those of shareholders? The answer to this question has to be yes if management expects people to help the company retain their critical knowledge.

Knowledge-retention solutions must be driven by each company's business strategy—there is no one-size-fits-all solution. In fact, the problem's severity may vary within the same company. One Shell manager says, "The average age in some of our plants is rising, and in others it's dropping. It depends on where you are in the cycle. It also depends on when units came up and when you laid people off."

The need to retain knowledge is going to become more critical. Baby boomers are aging. Technologies are becoming increasingly complex and interdependent. Globalization means more widely distributed work teams. Retaining organizational knowledge is not just a short-term management problem. Like the quality movement, it implies a whole philosophy.

Not surprisingly, organizations that have already begun to address the problem of knowledge retention have found culture to be the single most important area—and the one most difficult to change. Altering values, norms and practices takes time, and this creates a dilemma for companies under the gun. Managers may feel that they simply don't have time to change their culture to support more knowledge sharing.

But they don't have a choice. It is impossible to compete in a knowledge economy when your most valuable intellectual capital is constantly walking out the door. Employing better workforce planning and targeted knowledge-retention initiatives to address the brain drain now threatening many industries is the only way to avoid losing key sources of competitive advantage. ■

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[1] See Etienne Wenger, Richard McDermott and William Snyder, *Cultivating Communities of Practice*, Boston: Harvard Business School Press, 2002.

[2] See *"Retaining Valuable Knowledge: Proactive Strategies to Deal With a Shifting Work Force,"* American Productivity & Quality Center Report, April 2002.

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