Get our heads into it

Each Boeing employee has job-related knowledge. Here’s what steps the company is taking to manage and share this collective information—and use it as a competitive advantage

By Debby Arkell
It’s been said that knowledge management is 35,000 years old, dating back to the days when—as a matter of survival—a Cro-Magnon scratched information in the form of petroglyphs on a cave wall. While methods used at Boeing today may be different, sharing knowledge is no less a matter of survival.

In the last 15 years, economic, social and technological changes have dramatically altered the workplace and the way employees work. Globalization has brought new opportunities and increased competition. To boost productivity and profits, organizations have responded by merging, acquiring, re-engineering, streamlining and outsourcing. However, some of these work force changes resulted in a loss of institutional knowledge. At the same time, skilled workers—including those who have expertise in technical areas such as engineering—are in high demand, and it can be difficult for organizations to attract and retain employees with needed skills.

Economic conditions also have given workers more flexibility to change jobs in search of bigger and better deals. When an employee leaves a company, he or she also reduces that organization’s collective knowledge.

The demand for knowledge management will only accelerate as the post–World War II “baby boom” generation looks toward retirement. The oldest members of the U.S. baby-boom generation are in their early 60s. Indeed, today 18 percent of Boeing employees are eligible to retire, while another 19 percent will be eligible in five years, and another 40 percent in 10 years, according to Boeing Human Resources.

Making these figures even more critical: According to knowledge management experts at Boeing, 80 percent of what a company “knows” resides in its employees’ minds, while only 20 percent resides in repositories such as file shares, documents and wikis.

Boeing, like many companies worldwide, faces the challenges of an aging work force, increasing demand for critical skills and workplace decisions, and decisions on how to support programs where the product will outlast the tenure of the talented people who designed and built it. Yet unlike many companies, Boeing leaders across the enterprise know the solution to these challenges, and they are beginning to value and protect knowledge assets. Boeing’s goal: to foster an environment where knowledge and the strength of its culture can be leveraged quickly to empower an adaptable, agile work force and improve productivity.

“We have machines, buildings and tools,” said Jim Walden, former leader of the Knowledge Management and Benchmarking team
for Integrated Defense Systems. “But what distinguishes Boeing from other companies is its knowledge assets—what markets to approach; how to approach them; how to design, build and support our products. How we manage that knowledge is a market differentiator for Boeing, and it’s our people who hold the key.”

**WHAT IS KNOWLEDGE MANAGEMENT?**

Knowledge management, loosely defined, is a disciplined, holistic approach to using expertise effectively for competitive advantage. At Boeing, knowledge management is made up of a comprehensive system of processes, tools, methods and techniques that enable employees to capture and share information effectively.

“Raw data, when organized, becomes information that, when put into context, becomes knowledge,” said Jeanne Blue, Commercial Airplanes Technical Excellence and Knowledge Management, at a knowledge management forum this year. “Knowledge, when fine-tuned and combined over time with practical experience and prudence, becomes wisdom. Sharing and leveraging wisdom across the organization leads to innovation and a competitive advantage for Boeing.”

Boeing has many methods and tools already in place to facilitate knowledge management, including training; career coaching; job shadowing and mentoring; text, electronic and video archives; the Initiatives Database; Communities of Practice; even storytelling at events such as Excellence Hours and “brown-bag lunches.”

“Communities of Practice—knowledge-sharing communities—are truly the most effective way to share information: voluntary groups of people who are passionate about a subject,” said Jim Coogan, Knowledge Management Associate Technical Fellow, who also leads the Boeing Knowledge Management Community of Practice. “However, ultimately the key to knowledge management is to put the right tools in place—tools that are not intrusive and that fit the way people work—because people all work differently.”

It’s important to note that Boeing’s business units and the people within them all manage knowledge differently, with some techniques resonating more than others. Standardized knowledge-management efforts can be difficult to undertake at Boeing. Not only do people learn in different ways, but Boeing sites may have different needs. Despite these differences, knowledge management leaders at Boeing agree that driving a knowledge-sharing culture is a top priority, while the various tools are knowledge-management enablers.

The Engineering, Operations & Technology organization at Boeing is beginning to drive the knowledge-management culture.
Knowledge management in action

Knowledge management uses a wide range of tools and methods to help employees capture and share organizational knowledge. These solutions rely as much on organizational processes as on technological processes. Indeed, because Boeing’s business units and the people within them manage knowledge differently, some techniques resonate with some organizations more than others.

Below are examples of KM in action at Boeing.

**Engineering** is one organization at Boeing that is facing critical skill issues due to retirement eligibility and new-program growth. As such, it’s keenly focused and motivated to identify and retain critical skills and knowledge. Commercial Airplanes Engineering recently began using knowledge management assessment tools to close gaps in skills needed versus skills available. The tools help assess what skills are needed, what skills are in the group already, and the gap between the two. These assessments take into consideration the kind of work being done now and planned for the future, as well as technology changes, work placement decisions and more. Assessment results help Engineering leaders develop plans to close the gap, typically including training, mentoring, Communities of Practice, and Performance Evaluation and Development Partnership processes.

Similarly, Integrated Defense Systems Engineering is defining a pilot program where an organization can use assessment tools to identify needs, then take the results and use a self-help translator to review likely scenarios they’re facing—and suggested solutions.

**YourEncore** helps companies accelerate innovation by leveraging the expertise of retired scientists and engineers. Established in 2004 by Boeing, Procter & Gamble and Eli Lilly, YourEncore recruits retired Boeing engineers, scientists and technical workers—as well as retirees from many other companies, academic institutions and government agencies—to act as consultants to Boeing and other companies on a project basis. Expertise provided includes key technical support, guidance and independent analysis, strategic and high-level consultations, advice and technical strategy, and help mentoring and training the “next generation” of technology leaders. Contracting with YourEncore helps Boeing mitigate the potential “brain drain” that results from increasing numbers of technical workers eligible for retirement. Also, YourEncore offers Boeing the opportunity to work on challenging technical projects with other Fortune 500 companies in a variety of industries. For more information, visit www.yourencore.com.

**Video capture** has proven to be an excellent way to retain and transfer critical program knowledge, especially from single sources of information. The Delta program has used this knowledge-retention tool successfully for a number of years. Overviews, training classes, discussions among subject-matter experts, and presentations of program best practices are all videotaped.

The completed videos feature slides of text that are synchronized to the videotaped footage. Each video product is indexed by topic so viewers can decide which parts to watch. The final product can be viewed over the Web on a standard PC station or distributed in a DVD format.

Captured Video Products are now an important part of transferring Delta knowledge as the program becomes part of the newly formed United Launch Alliance. New employees at ULA can initially review the videos and receive critical training and insights from them as part of the company’s “onboarding” activity. The video files are kept available so employees can use them as refreshers or reference materials to support ongoing job requirements.

The **Initiatives Database** helps accelerate the rate at which best practices can be shared and replicated across the company. The Initiatives Database provides a repository of information for programs and functions to locate and replicate best practices and tracks high-leverage, initiatives-related projects more effectively. It also is a tool senior leaders will use to track and measure their teams’ progress in implementing and replicating projects that support the company’s four growth and productivity initiatives: Lean+, Internal Services Productivity, Global Sourcing and Development Process Excellence.

Boeing currently offers an internal “wiki” service for use by employees (http://blogwikiservices.web.boeing.com on the Boeing intranet). In the same family as virtual team rooms and blogs, wikis are online collections of information input by users. Readily accessible to all users, wikis are a quick and easy means for employees to share knowledge. For example, a small Safety, Health and Environmental Affairs team uses a wiki to track things related to federal- and state-level water regulations, gathering and posting the information—without requiring a webmaster to do the posting.

However, wikis are more than a knowledge repository. Information in wikis also can be modified by all users through their Web browsers. This means that one person or group no longer is the sole “owner” of information, and data can be checked by thousands, not just a few. Creating or participating in wikis or blogs carries substantial personal and professional responsibility. Employees should review the Boeing blogging guidelines on the Boeing intranet at http://inside.boeing.com/media_guidelines before setting up a blog or wiki.

**Communities of Practice** are a powerful means by which information can be shared. In knowledge-management circles throughout Boeing, Communities of Practice are considered one of the more prominent face-to-face methods of knowledge sharing.

The Ed Wells Partnership, a Renton, Wash.–based joint initiative between Boeing and the Society of Professional Engineering Employees in Aerospace, regularly holds classes to teach employees about Communities of Practice and how they promote knowledge sharing. These classes encourage collaboration among Communities of Practice leaders from around the company and provide a forum to share lessons learned, new tools and other expertise. Employees can promote other communities, and help sustain existing ones. EWP also hosts a forum to address unique issues faced by Boeing Communities of Practice leaders called “CoP squared,” made up of more than 50 members across organizational and geographic boundaries.

The **Boeing Northwest Technical Excellence Knowledge Management forum**, held this past May in Seattle, drew nearly 300 employees, representing all business units from 12 states, and was designed to allow knowledge management user communities to talk with others about what did and didn’t work in their groups. Next steps for the group include exploring ways to share program-specific lessons learned and best practices, as well as how to address knowledge-management issues that cut across program boundaries.

—Debby Arkell
Why is knowledge management important to Boeing?

Knowledge management matters to Boeing for many reasons. Among them:

• Retains expertise of employees who leave the company
• Shares expertise, best practices and lessons learned across the enterprise
• Avoids reinvention and accelerates innovation

It’s our future

Actions cited in this story show how employees are applying concepts of the Boeing Management Model to support the company’s business strategies. Here’s how.

• Growth and productivity: Efforts let Boeing share and retain its employees’ collective knowledge—and prevent the need to duplicate efforts or reinvent solutions.

To learn more about the Management Model, visit http://bmm.web.boeing.com on the Boeing intranet.

Across the company, EO&T is considered to be the “functional home” for knowledge management within Boeing’s technical organizations, and it is starting to pull at common threads from BCA and IDS’ knowledge-management efforts.

EO&T is assembling a framework for business units and groups to evaluate their knowledge-management challenges. That framework includes using assessments to determine a group’s knowledge needs and scenarios, as well as recommend proven solutions.

Yet even with common overarching goals, all agree that what works in one place might not work for another. “While knowledge-management concepts are applicable to every Boeing group, knowledge management isn’t a one-size-fits-all solution,” said Pam Eakins, leader of the EO&T-sponsored knowledge-management effort. “That’s why we’re using a framework approach, to provide structure but allow flexibility for solutions based on organizations’ specific needs.”

Walden said that organizations such as Finance, Supplier Management, Program Management and Human Resources share similar challenges. “We’re automating and getting leaner, so the nature of our work is changing,” he said. “A lot of what we do centers on how our brains use systems to create data, organize it and turn it into knowledge—and then share it. Our work is heading in the direction of a ‘knowledge organization.’”

WHO OWNS THIS KNOW-HOW?

As Boeing becomes more and more integrated through common processes, languages and tools, knowledge becomes an increasingly important asset to the company, not just one business
Wheel of knowledge

Knowledge management at Boeing takes a holistic approach to using knowledge for competitive advantage. The knowledge management model, shared by Commercial Airplanes and Integrated Defense Systems, depicts the "life cycle" of knowledge management, from knowledge creation through retirement. Knowledge and learning are part of a continuous cycle: The retirement of some knowledge can lead to the creation or discovery of newer, more up-to-date information. Organizational knowledge and culture are at the heart of a system of processes, tools, methods and techniques designed to identify, capture, retain and otherwise manage knowledge through its life cycle.

unit. This becomes the foundation for a successful knowledge environment and allows for sharing, communication and finality of information. Therefore, knowledge management is considered a business imperative, and one that can be used for competitive advantage, knowledge-management leaders said.

Consider this: In past generations, airplane assembly mechanics worked in a factory where products were developed, built and delivered under one roof. Today an increasing percentage of Boeing work is performed using information systems and programs in which products are designed jointly and virtually worldwide.

In fact, Boeing has one of the largest human network operations around, made up of approximately 160,000 people. "If we don’t know what others are doing, we end up repeating mistakes," Coogan said. "I have a vision for the future called ‘knowledge-centric’ operations—where knowledge becomes connected in the way network-enabled operations are being developed today, so where there’s a knowledge or skill void, or need, resources automatically shift to fill it.”

Blue noted that Boeing doesn’t pursue knowledge management just for its own sake. “It’s not a goal in and of itself,” she said. “There are tangible business benefits that result when we improve the way we capture, retain, share and use knowledge. It enables us to be more productive and efficient, more innovative, and provide higher-quality products and services.”

Knowledge management can increase customer and employee satisfaction, reduce risk and flow times, and reduce costs as well.

“The value of knowledge never depreciates,” Coogan said. “We must optimize knowledge flow by focusing on culture, people, processes and technology—and in that order. Studies show time and again, knowledge-management efforts fail that are restricted to a technology solution.”

As cultures can vary even from site to site at Boeing, it’s imperative that Boeing teams gain better understanding of cultural and people issues, Coogan said.

“BCA manages knowledge differently than IDS, partly because BCA manufactures a single product line; IDS manufactures multiple, varied products,” he said. “Both groups have very passionate people, and what works in one place might not work for another.” Understanding cultural and people issues will result in common processes that can be used to share knowledge seamlessly.

“We must capture and transfer information in a manner that’s invisible—knowledge without borders,” Coogan said. “In so doing, the difference will be between our ability to merely capture the high ground or to be the ones who go out and set the high ground.”

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For more information

For more information about knowledge management at Boeing and related topics, visit these Web sites on the Boeing intranet:

- Commercial Airplanes Engineering & Manufacturing Knowledge Retention and Sharing. This site explains the objectives of the KR&S effort and provides guidance, processes and tools to determine organizational competencies and comprehensively assess knowledge and skill needs and gaps. It also offers recommended knowledge-transfer methods for closing those gaps. http://knowledge.ca.boeing.com.
- Northwest Technical Excellence Knowledge Management Forum. The Web site for this year’s event, which took place in May, offers the PowerPoint presentations given by the event’s speakers. http://btec.web.boeing.com/kmf.
- Ed Wells Partnership. The Ed Wells Partnership, a joint initiative between Boeing and the Society of Professional Engineering Employees in Aerospace, has a program devoted to knowledge management at Boeing. The organization’s Web site offers information on Communities of Practice, along with other ways of knowledge sharing. http://edwells.web.boeing.com.

In addition, the organization YourEncore offers retired employees the chance to serve as consultants to Boeing and other companies on a project basis. Boeing helped establish YourEncore in 2004. For more information, visit the group’s Web site at www.yourencore.com.