



A U.S. Army pilot undertakes training in an Apache Longbow simulator, part of the Longbow Collective Training System. The trainer, located at Ft. Hood, Texas, is a networked system of up to six aircraft in one simulation that provides commanders, staff and crewmembers a superior capability for developing and sustaining combat skills.

BOEING

# Keep 'em flying

Why Boeing is taking a companywide tack in investing in aircraft services and support

By Bill Seil

**D**esigning and building an airplane requires a lot of expertise—and investment. But did you know that two-thirds of the life cycle cost for both military and commercial airplanes goes to keeping them operating efficiently after they've been delivered? Once an airplane is delivered to the customer, it needs to be properly operated, maintained, repaired and sometimes modified.

Boeing, through its two main support organizations—Commercial Aviation Services (CAS) at Commercial Airplanes and Global Services & Support (formerly Support Systems) at Integrated Defense Systems—helps its customers do this by providing air crews and ground crews with training, instruction manuals, test equipment and technical assistance. Helping CAS and Global Services & Support best meet these customer needs is the main objective of the new Support & Services domain. It's one of eight Technology Domains in Boeing's Enterprise Technology Strategy (ETS), designed to create a sustainable technical competitive advantage that increases Boeing's growth and productivity.

In each domain, different parts of Boeing are working together to develop a shared understanding of technology needs, capabilities and investments—and ultimately to provide the best support to Boeing's customers. The focus of the Support & Services domain is important to Boeing because businesses such as CAS and Global Services & Support account for a substantial portion of Boeing revenues.

"What we do has a tremendous effect on the reputation of Boeing products," said Steve Swaine, the domain's leader. "And we also are leveraging our technology to bring more support business into the company—even for aircraft and possibly other systems that we didn't originally build."

## 'CONSTANTLY EVOLVING' TECHNOLOGIES

The ETS' objectives are to ensure Boeing's technology plan supports the company's business strategies and provides competitive advantage; identify opportunities to optimize Boeing's investments across the company; create a "One Company" culture in sharing perspectives across the enterprise; and develop the portfolio using efficient, effective processes. The Technology Domains help integrate Boeing's business units and Phantom Works to ensure the technology strategy supports the company's near-, mid- and long-term business strategies and maximizes the yield of its technology investments.

The domains, headed by key experts in their fields and supported by a Senior Technical Fellow with special insight into a particular technology, have been developed to allow similar technical communities across the enterprise to develop a shared under-

standing of technology needs, capabilities and investments. The ultimate goal is to develop an integrated technology plan that benefits Boeing's customers and the company's bottom line.

"The support and services business is faced with a constantly evolving series of technologies," Swaine said. "We have to make sure that we are leaders in the field. Productivity is an important part of what we do, but we're also focused on growth. There's a special opportunity here to expand our product and service offerings."

The domain is taking a comprehensive look at support and services technology research. Specifically, it wants to ensure that money spent on this research is aligned with the business strategies of Boeing's business units. It's also working to share research results across the enterprise, and to eliminate inefficiency and duplication. An important part of this effort is working with the business units to clearly define their technology research needs.

One of the domain's biggest challenges is simply getting a handle on all of the technology research being done. CAS, Global

## What it's made of

Each of the Technology domains in the Enterprise Technology Strategy has several subdomains that leverage specific technologies. The subdomains for the Support & Services domain are:

- **Assessment:** The technology needed to determine platform/system readiness and specify optimal corrective action.
- **Repair & Modification:** The technology needed to repair and upgrade platforms/systems post-delivery (including derivative mods).
- **Material Management:** The technology to plan, source, track (asset visibility), and allocate materials and their configuration throughout the supply chain over their entire product life cycle.
- **Tech Data:** The technology for creating, transforming, maintaining and delivering technical data.
- **Training:** The technology for creating, maintaining and delivering customer training. This includes printed materials, computer-based training, virtual/constructive simulation and live training.
- **Support Equipment:** The technology associated with infrastructure, special-purpose tools and test equipment required to maintain platforms/systems.
- **Support & Services Integration:** The technology that integrates other Support & Services domain technologies to automate overall support operations.



Services & Support and Phantom Works all have active research and development programs in the support systems area, each with different approaches. Until now there has been little effort to develop a central listing of R&D projects. “The Support & Services team provides important expertise to the e-Enabled products and services, like Airplane Health Management, that help us bring life cycle solutions to our airline customers,” said Lou Mancini, CAS vice president and general manager.

The Support & Services domain is organized around seven subdomains (see box on Page 33). “The categories we identified are traditional areas of support, so we had a fairly natural model for creating our subdomains,” Swaine said. “They also aligned well with our business units and with our customers’ needs.”

According to Swaine, establishing the subdomains has created a network for people to discuss projects and develop synergies—something that didn’t exist in a major way before. He also has chartered teams of experts from across the enterprise to develop integrated “enduring technology plans” that document the strategy, commitments, technical competitive assessment, intellectual property plan and yield plan for key technologies.

Mike Darnold, director, Integrated Logistics Support for IDS in Wichita, Kan., said the domain is of great value to programs that build military derivatives of Boeing commercial airplanes. The Support & Services domain, he said, is working to achieve greater commonality between IDS and Commercial Airplanes data systems used on the programs. These business units and Phantom Works also benefit from sharing ideas that can be adapted to other projects. “We’re not seeing any of this ‘not invented here’ syndrome anymore,” Darnold said.

Lee Hibbets, technology portfolio manager in CAS Product Development, is an enthusiastic advocate of the Support & Services domain. He recalled participating in a workshop Swaine organized that included employees who work in airplane health management. The participants shared information and began building a unified companywide technology strategy that coordinates the company’s investment in the future and leverages the best of

Boeing, he said. “The domain is a great forum for learning about and finding these technologies within the enterprise,” he said.

**WHAT LIES AHEAD**

CAS is finding similar opportunities by participating in other Enterprise Technology Strategy domains. Hibbets said the Environment domain can help develop more efficient aftermarket products and services for airline customers. The Networked Systems domain can generate technology that CAS could apply to e-enabled programs for commercial airplanes.

While many synergies exist, Swaine notes that not all technologies can be shared between business units. There are major differences between military and commercial products, as well as customer needs. The domain teams must take great care in determining which technologies can be adapted from one program to another.

Commercial Aviation Services and Global Services & Support both provide a wide range of support and services to Boeing customers. CAS focuses on five key capabilities: customer support, materials optimization, operational performance, training and fleet enhancements. Global Services & Support provides its customers with maintenance services, modifications and upgrades, integrated logistics services, and training systems and services.

While considerable work remains to be done, Swaine is pleased with the Support

& Services domain’s accomplishments thus far. The recent decision by Global Services & Support to hire a technology director will add momentum. Swaine said the domain has also made significant progress in the area of airplane health management.

Looking ahead, the Support & Services domain plans to develop a data base of all support and service technology research projects taking place within Boeing. Swaine envisions a tool that will capture and track the company’s investment in these activities, and enable leaders to analyze where improvements can be made.

There is also a need to identify similar work that is taking place at universities and companies outside of Boeing, Swaine said. That will help the business units to import technologies that support their business strategies. It will also guide the company in deciding which research should stay within the company and which projects should be sourced to outside research organizations.

“We are in a unique position in this industry, doing what no other company can do,” said Global Services & Support President Dennis Mulenburg. “We are leveraging the best of two very large businesses—Commercial Aviation Services and Global Services & Support—and taking advantage of multiple synergies and joint technology investment to achieve significant value for our customers.” ■

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**Commercial Airplanes’ Operations Center in Seattle delivers round-the-clock, comprehensive support to airlines operating more than 12,000 Boeing jetliners worldwide. Boeing is taking an enterprisewide approach to developing technologies to bolster its support and services businesses.**

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