

AVIATION WEEK

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INFORMATION TECHNOLOGY

Find a Part

New software helps all of Boeing see what is available

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The bigger the enterprise, the bigger the headache keeping track of it all.

"The fundamental problem we have is information overload," says Joseph Hafner, Boeing's senior manager for engineering software for structures and standards. "It's hard to find things."

That is especially true of the thousands of parts that have been created or refined over the years by in-house designers or vendors working for the company's commercial and military airplane programs.

Capturing knowledge about those parts, such as what a bolt is made of—what its qualification testing is, or its stress and strain characteristics—and then distributing this from one set of designers to another in different business units, is so difficult without an enterprise-wide system that it is unlikely to be done.

For several years, the company has been testing a suite of 3D applications from PARTsolutions for building on-line parts catalogues that can be readily accessed by design engineers regardless of the legacy computer-aided design (CAD) software they were written in. This flexibility will allow designers to search through past programs across Boeing's business units.

The Milford, Ohio-based PARTsolutions is the U.S. representative of an eponymous software developed by Germany's Cadenas GmbH. in 1992. Cadenas's first big industrial clients were in the automotive industry, but as it pushed into aerospace it signed Airbus and MTU. Airbus first began applying

has used two PARTsolutions search engines for those programs. Its concentration has been on internal standard fly-away parts such as fasteners, clips, brackets and stringers.

Boeing also started out small with PARTsolutions, but is now implementing it across all of its manufacturing units. That undertaking began during the much larger effort over the past decade of merging the information and technology systems of Boeing and McDonnell Douglas. Just melding the companies' human resources departments was a major task, notes Hafner. Integrating their manufacturing systems will not happen overnight.

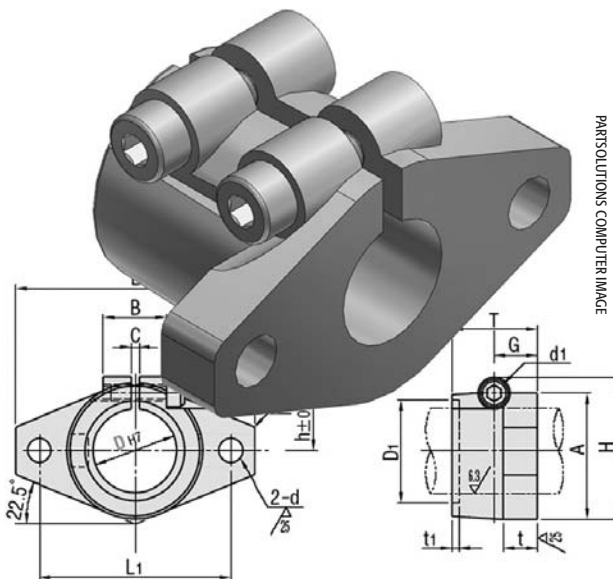
The Seattle-based manufacturer has instituted a number of internal standardization efforts. Boeing Commercial Airplanes' Product Standards and Digital Data format, which uses a single source of shape data for standard part geometry to create a standard parts model, was one of the most advanced.

"We had some small-scale, limited internal developments in place for a number of years, but none was capable of, or anticipated a need to, go enterprise-wide," says Hafner. "None was comprehensive enough that it competed with PARTsolutions on a head-to-head basis."

The tracking system was implemented gradually. Tim Thomas, PARTsolutions' founder and partner, recalls that the initial interest

came from a Boeing Integrated Defense Systems unit in 2003 that was looking for ways to consolidate legacy parts listing systems.

More implementations followed and all have been tested for several years. As other post-merger work was cleared,



Boeing is implementing PARTsolutions for 3D depictions of parts, such as this generic example, across all of its business units.

Cadenas's geometrical similarity search engine in a pilot project for the A400M military transport development program in 2005. Later, the aircraft manufacturer started a similar pilot initiative for the A380 commercial transport.

Since June 2008, Airbus/Hamburg

increased emphasis was placed on these manufacturing advances. "We are now in the process of populating catalogues with data that projects need," says Hafner. The learning curve has not been steep because the process is self-explanatory, he adds.


Boeing has been digitizing products in various formats for years to make design and manufacturing more efficient. For instance, 747 designs have transitioned from paper drawings to Mylar sheets from Catia CAD. The PARTsolutions catalogue evolution is occurring as the first flight-test 747-8 is nearing rollout—

marking the third iteration of an airframe that entered service in 1970. The new fuselage retains details from the past, but is 18 ft. longer than a 747-400's and sports a new wing, aerodynamic design, engines and avionics systems.

Costs climb for modeling details in such a mixed design if engineers are unaware of the performance and certification characteristics of all of the parts available. Existing CAD systems can do this. But one of PARTsolutions' strengths is that it can feed the data downstream to other users on other systems.

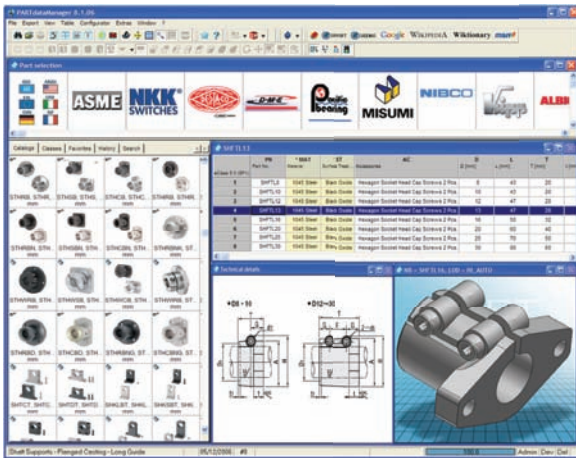
Although similar products were avail-

able, Hafner says Boeing did not conduct a formal competition when it selected PARTsolutions.

He expects PARTsolutions to be especially useful in technology research and new parts production. Designers will be able to query vendors about the material and mechanical properties of a new bolt, then determine if it is ready for mass production. The design would then enter the supply chain acquisition process to those that qualify. Adding such items to a parts catalogue shortens the process by allowing designers to query the catalogue with their requirements. 

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