Virtual performance

Boeing employees create high-tech library of data and images for every place on Earth

By Chris Haddox

For Robert Kramer of Phantom Works, and the growing list of other Boeing users, BGIR (pronounced bigger) is definitely the better way to find exactly what they need.

"Earth is our playground and we are expanding our sandbox," Kramer said. "And that's good news for those who need what we have."

What he has is highly accurate digital information, and the "sandbox" is the Boeing Geospatial Intelligence Repository, or BGIR—an ever-growing collection of data such as images and detailed 3-D renderings of any point or place on Earth.

"We are interested in any kind of data that defines or describes Earth," said Kramer, who brands himself and others who collect and maintain the data as high-tech librarians.

The repository began 16 years ago as a grass-roots effort by a small band of computer modelers known as the Synthetic Natural Environment Working Group. Its members, from various programs across Boeing, did digital visualization work. They shared ideas and data such as digital images and maps of military bases or terrain. That collaboration reduced and prevented redundant work.

In 2007, at the group's biannual meeting at the Boeing Leadership Center, St. Louis, the members knew they were on to something and pondered how to make geospatial collaboration even bigger and better.

"I left the meeting and began putting together the idea of an online repository, but no one really had the time to do it," recalled Kramer. He made the time and began collecting data from the National Geospatial Intelligence Agency and commercial satellite providers for the Virtual Warfare Center, where he is the BGIR lead engineer for Advanced Experimentation & Visualization in Phantom Works.

As Kramer's collection grew, he noticed others had their own private geospatial data "stashes" and thought, Why not combine those and put them into a single place and make it official? The repository was born.

Rick Gaylor was one of the first to realize its potential. Gaylor is a visual engineer at the Integrated Technology Development Lab in Seattle. He builds visual systems and visual databases for trainers and Boeing Business Development, and the repository gave him access to data and information he never had before.

"For the first time, we are able to build data sets for areas of interest for the entire planet," Gaylor said. "That's incredibly powerful when creating a true representative visual database for our users. We could never do that before."

Gaylor convinced his management by putting the system to the test and prototyping a high-resolution digital model of Elmendorf Air Force Base in Alaska over a weekend—not the 18 months an outside vendor proposed.

"I was able to download the content, prepare it in about an hour and in one day re-create Elmendorf with more detail than ever before, which is the beauty of the BGIR," Gaylor said.

The Boeing Geospatial Intelligence Repository became official in September 2009. So far this year, it has saved the company more than $2 million—and thousands of labor hours. "We've realized the cost savings is an order of magnitude bigger than the cost it takes to gather and keep the information within BGIR," Kramer said.

Almost every large Boeing program has used the repository, including Commercial Airplanes. Customers have used it, too.

"We provided SBInet [Boeing's border security program] a very accurate digital terrain model for developmental use and that has now become one of the gold standards in how to do terrain mapping," Kramer said.

Nearly 20 requests for information come to the repository each month.

Since that first meeting at the Boeing Leadership Center in 2007, the amount of data the repository contains has grown from three terabytes to nearly 50 terabytes. It will soon double. The next goal, according to Kramer, is a petabyte, which is a quadrillion bytes, an amount equivalent to 100 times the data contained in the print collection of the U.S. Library of Congress.

The repository is on its way to becoming the official data source for Boeing, Kramer and Gaylor say, which will bring additional resources to provide more data. It also will become more accessible and easier to use, and customers will be able to request data online and download the information themselves over the Boeing network.

Bill McLean, manager of the Geospatial Intelligence Program–West in Seattle, said the repository is a perfect example of how the resourcefulness and creativity of a few can benefit the entire Boeing enterprise.

"The success of this effort shows how Boeing employees can empower themselves to proactively chart a larger course," McLean said. "We've only begun to identify the value this effort brings to the Boeing team."

Added Gaylor: "We want to be able to give them the world." With BGIR, Boeing can. ■

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PHOTO: From left, Rob Klein, geospatial engineer, Rick Gaylor, visual engineer, and Robert Kramer, Boeing Geospatial Intelligence Repository lead engineer, look over a synthetically generated Seattle skyline.

GRAPHIC: BOEING GEOSPATIAL INTELLIGENCE REPOSITORY
PHOTO: RICHARD RAU/BOEING

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