

Web Tools Add Depth to Fleet Data

By Robert K. Ackerman



The USS Mount Whitney, command ship of the U.S. Second Fleet, sails in support of operation Enduring Freedom. The commander's brief has been enhanced by a new Web-based briefing tool that replaces traditional PowerPoint presentations.

Commander's briefing now presents more than just the facts.

Direct database presentation is pushing PowerPoint out of the way for a U.S. Navy fleet commander. A pilot project for the Second Fleet has changed the admiral's briefs from static factual displays to near-real-time Web-based presentations that allow users to access in-depth information through extensible markup language, or XML.

This step is the information equivalent of going from black-and-

white imagery to color. Instead of merely being presented raw facts, the commander can delve into the briefing data to learn the subtle shades of information that make up the briefing points.

Other U.S. Defense Department programs are exploring the use of Web services for database retrieval. Some of these services are Java-based rather than XML. The Navy's personnel command used XML services for tracking purposes, while Surface Fleet Atlantic (SURFLANT) adopted the technology for presenting reports. Web-based services offer the potential for extracting and moving key database information across Internet-protocol networks throughout the military.

Lt. Cdr. Eric Higgins, USN, collaboration officer, information management section, U.S. Second Fleet, explains that the fleet must tap information from five databases maintained at Fleet Forces Command. These databases serve as the authoritative data sources for the information that the fleet must pull for its commander.

The fleet worked with Herres & Lee Corporation, Springfield, Virginia, and Microsoft Consulting Services, Redmond, Washington, to develop the integrated interactive data briefing tool (IIDBT) used for generating the commander's brief. The IIDBT both automates formerly manual processes and presents the brief in hypertext markup language.

The fleet subscribes to five XML-based Web services that extract information from the five Fleet Forces Command databases. A Microsoft .NET application populates a local fleet database with this information. Cdr. Higgins notes that the fleet maintains this local database because it cannot always count on constant connectivity with shore-based facilities.

The .NET utility extracts the data from the local persistence store and merges it automatically through slide templates into the commander's update. Presenters can edit each slide to highlight facts or to update original database material with later information such as a voice report. When the slides are approved for the brief, they are automatically inserted with other briefs into the commander's overall presentation. The result is that a PowerPoint presentation has given way to a Web-based, Web-enabled briefing that is conducted over the Web.

A major driver for the shift to this approach was the large amount of manual data mining that was being performed by personnel for each daily briefing, Cdr. Higgins relates. Personnel had to visit several Web sites to obtain data, review text messages to retrieve data or even access the database directly. At the apex of this quest would be personnel manually transcribing all of the obtained data into a static PowerPoint briefing. This could take up to two or three hours, Cdr. Higgins relates. The admiral would receive a briefing based on information at least two hours old and, because it came from different sources, the information potentially was contradictory.

One big advantage that the IIDBT provides over previous briefing standards is that the fleet commander has access to background data from the brief. Previously, a briefing would present information in static form without any capability for exploring facts in depth on demand. For example, a casualty briefing would list the numbers per ships, but any questions posed by the admiral would require the briefer to provide the answer later. Now, with the XML system, the data is integrated. If the admiral wants further information on a casualty briefing, the briefer can drill down to the local persistence store and bring up the amplifying information. Cdr. Higgins allows that the fleet commander can go all the way down to the actual casualty report itself. "It gives him the flexibility to either take a broad-brush approach and just look, or he can ask, 'What's up with that item?' The brief now becomes more of a discussion than just a sort of data dump where everybody just spews out information to the admiral."

Under the new system, the briefers draft the slides that form the briefing. The data on those slides, however, is linked back to the data source. So, when the

admiral wants to pull up the background data, the system makes a live call into the local persistence store to bring back the data.

Cdr. Higgins notes that planners chose to draw directly from the local persistence store rather than establish live links to the authoritative data source. One reason is to ensure ready information—a fleet at sea cannot always access a shore-based database. Another reason is that the briefer knows the material in the local store. If the brief were linked to an authoritative data source, the backup material could change during the briefing. The briefer could find himself or herself presenting a point that winds up being contradicted by newly input backup data. “No briefer wants to be surprised by what comes up on the screen,” Cdr. Higgins warrants.

Another advantage offered by the Web services approach is that the briefing can be forwarded to others via the secret Internet protocol router network (SIPRNET). Again, the briefing’s links would be accessible by recipients. And, the briefing’s XML format reduces the size of the briefing from the large multi-megabyte volume of PowerPoint presentations. This reduces bandwidth demands for Internet routing.

Planners reviewed several solutions before choosing XML Web services for the fleet. One option considered but rejected was to build a front end to the authoritative data sources. That way, fleet briefers would need only visit one Web site to obtain the data that they required. However, Cdr. Higgins notes, different people tend to use the same data differently for varying purposes. This precludes building a front-end Web site that would please all of its users.

Four other proposals took a different approach. Officials decided that it was better to adopt their solution, which was to permit users to customize their front end to meet their own needs. The back-end data coming from the authoritative source would be standardized. The XML option takes this approach. It leaves the data alone.

Using XML provides another advantage. By having access to accurate, up-to-date data, personnel can spend the two hours it took to prepare old-style briefings analyzing the data to extract key points for the admiral. And, because the data is integrated, users can exchange points knowing that they are referring to the same data, even if in a different format. “It has cut anywhere from four to five hours of manual data mining time each day,” Cdr. Higgins says. “And, it’s the most accurate up-to-date data that is available, other than within the constructs of how often that database is updated.”

The idea was conceived in fall of 2002, and the fleet received funding for it that December. The project began in February of 2003, was completed in July and became operational in August. Cdr. Higgins relates that the beginning of the

project was delayed slightly so that it would not interfere with a changeover from Windows NT to Windows 2000.

As with any new technology, training and education posed a challenge, especially for data access. Cdr. Higgins notes that data “owners” tend to be reluctant when confronted with a new approach to extracting and presenting that data. These people had to be educated not just on how the new system worked, but also on what Web services are, he relates. And, operators had to learn how to use the new tool fully.

The biggest technological hurdle involved Microsoft Windows Server 2003. The XML system resides on it and uses its embedded Sharepoint Services Center, and the Second Fleet was one of the first operational commands to employ Server 2003. So, the fleet’s information technologists had to contend with learning how to use a new database tool on a new server operating system. The fleet is still a Windows 2000 network with some Server 2003 servers, Cdr. Higgins relates. While the new database system can be installed with Windows 2000, it requires a Sharepoint portal server to perform workflow and administration.

Cdr. Higgins relates that this effort was a pilot project that had to be completed in 120 days. This limited the scope of the information that would be included in the commander’s briefing, and it could be attained on only one network. Fleet officials chose SIPRNET for the program. So, officials did not include other data such as extensive intelligence information and imagery. However, the commander allows that the fleet is looking to branch out into these types of information. Other potential areas include unclassified material such as weather data and public affairs information. As the fleet moves into cross-domain solutions, XML Web services may prove to be an ideal way of transporting data across security enclaves, he offers. This would apply to the SIPRNET as well as to Top Secret or unclassified networks, and the use may be seamless to the customer.

As a pilot project, the IIDBT program also has ramifications for the rest of the Navy. Cdr. Higgins offers that it will grow horizontally throughout the Navy as more of the service begins to subscribe to these kinds of Web services. It also will grow vertically as the Navy becomes more involved with cross-domain solutions within both U.S. and coalition networks.

Now the Navy is wrestling with how it can implement this type of solution on an enterprise level across the service. Cdr. Higgins allows that this XML approach represents just one small step in the journey to achieve ForceNet. Instead of just presenting an admiral’s brief, XML services may provide live operational targeting data for weapons. “This is where it is really going to get interesting,” he says.

Implementing an XML solution will involve systems issues, he admits. For example, the technology does not work well with Windows NT operating systems, which are used by many surface ships.

The commander notes that SURFLANT subscribes to similar Web services. Unlike the Second Fleet, however, this command performs live calls on the authoritative database. Its applications revolve around reports, not briefings.

Additional information on the U.S. Navy Second Fleet is available on the World Wide Web at <http://www.secondfleet.navy.mil/index.htm>.