

Narrowing the Focus



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New data-linking technologies are giving north Texas homeland security, law enforcement and emergency management officials a keen edge. The new tools enable investigators to search and link data by geography, and allows them to identify trends or clusters of events. Officials also use a mining technology to search and group similar data, providing a visual presentation of each data group. Together, they allow investigators at the North Texas Fusion Center (NTFC) to search millions of documents and identify trends without having to peruse each file.

The NTFC is one of many fusion centers in the country whose function is to exchange and analyze data that might relate to homeland security threats. The NTFC is unique because it deals with all hazards - man-made and natural disasters.

The NTFC collaborates with the U.S. Department of Homeland Security Operations Center, the Centers for Disease Control and Prevention, the North Texas High Intensity Drug Trafficking Activity Intelligence Center, the FBI Dallas Emergency Response Network and the local FBI office concerning detection and prevention of critical all-hazards situations.

"We have a very strong focus on prevention instead of the normal response, recovery, detection," said Kelly Stone, director of homeland security for Collin County, where the facility began operations in February 2006. "That's what's a little different about us. These tools are really beneficial to meeting the mission and answering the needs that are associated with the type of queries and access that you need to accomplish that."

Centralized Intelligence

Fusion centers are primarily a response to 9/11 - when homeland security officials knew scattered details about the airplane hijackers, but didn't put together the pieces by working across agencies, so the information was of little use. The fusion center provides a central clearing-house for data, which can be analyzed and shared with the appropriate agencies.

The intelligence comes from many sources, including reports from the media, police, fire departments, emergency management and public health agencies, airports and hospitals. The documents are collected by the North Central Texas Fusion System, where they can be sifted and analyzed.

MetaCarta software called GTS was recently introduced to the fusion system in a February 2007 pilot. The software lets analysts sort through millions of documents and find keyword matches. More importantly the software incorporates a geographic component, giving investigators not only viable information on gangs, drug runners, smugglers or hazardous situations, but also the locations of criminal incidents pictured as icons on a map.

Location, Location, Location

"That's what it's all about," said Bari Lee, senior intelligence analyst with the Collin County Department of Homeland Security. "During the Clinton years it was, 'It's the economy, stupid.' Well, really in our business, in intelligence research nowadays more often than not it is, 'It's the location, stupid.' That's what we need to know."

Seeing activity patterns based on activity hot spots is important to investigators. "It's kind of like a daily Google tool," Lee said. "It allows me to view the missing components of any kind of textual search. It brings up the same data that a normal Google search would, but it brings that geographic component as well."

The analyst tool was used in a statewide operation to analyze types of border-related criminal activity. Though officials are tight-lipped about the details, Lee said the tools helped them find some of the main geographic corridors of activity.

Lee said it helps to have a starting point - some information to query the system with, but it is not always necessary. "That's one of the surprise features from my standpoint. I can start out with a hypothesis about what's going on with, say smuggling along a certain corridor, and I think it involves a particular group. I'll punch that group name into MetaCarta, and it might show me a different location in a report that I never would have suspected," Lee said. "Or it might show me different group involvement or a different smuggling route. It gives me things I would never have guessed, and it provides uniqueness within the research paradigm that I would never have had before."

The system's geographic function gave investigators actionable information, said Randy Ridley, MetaCarta's public-sector vice president and general manager. "There are lots of tools out there that help map social organizations or *Al Qaeda's* organization or find trends, but in the intelligence and fusion center area, until you get to the point where you can take action, it's kind of a theoretical exercise," he said. "You can send surveillance in there, you can take action, and that's the key value for any software in this area. It's great to have a nice trend and a nice bar chart and all these things, but what action do you take afterward? The key payoff is action."

Visual Component

Another data-mining technology, called Starlight, helps law enforcement search for themes or clusters of information. Starlight - originally developed for the intelligence community by the U.S. Department of Energy's Pacific Northwest National Laboratory, operated by Battelle - assembles clusters of documents that relate to one another, and labels them with a three-word caption.

For example, if a Dallas sports page were run through the system, the system might come up with a three-word caption, such as "Nowitzki, Dallas, Streak" under which additional stories about the Dallas Mavericks basketball team, player Dirk Nowitzki and a recent winning streak would appear.

This does much of the legwork for an investigator who would otherwise have to comb through thousands of documents to uncover the proverbial needle in the haystack. The human brain can compare a few documents at a time, but after reviewing hundreds of documents, that ability begins to degrade.

The Starlight system mitigates that by doing the research and also adding a visual component to the findings - something the human brain can remember more easily. Like the MetaCarta software, Starlight ties together clusters of information with a visual component that shows relationships between the documents in terms of topography, time and concept. Similar themes placed in clusters give the investigators an easy way to pinpoint details.

"This allows you to see instantly the themes within that massive amount of text and see exactly where you want to investigate without having to read everything in totality and sort it out for yourself," Lee said. "It instantly portrays the exact cluster that you're interested in and exports it to a readable format where you only read what's relevant to your issue."

Starlight presents the information in three-dimensional graphics, providing clusters of information in a visual format based on location, concept or other parameters. Each report or document would be represented on the screen by a single star. Stars are clustered by a common theme. So for example, reports relating to a certain gang or reports relating to a certain geographic area would appear as clusters on the screen.

Both technologies give investigators a better idea of where to put their resources and help them avoid the fatiguing search through thousands of documents. "That's what it's all about," Lee said. "Finding innovative tools that will give us different options than we otherwise might have had with just a textual search."